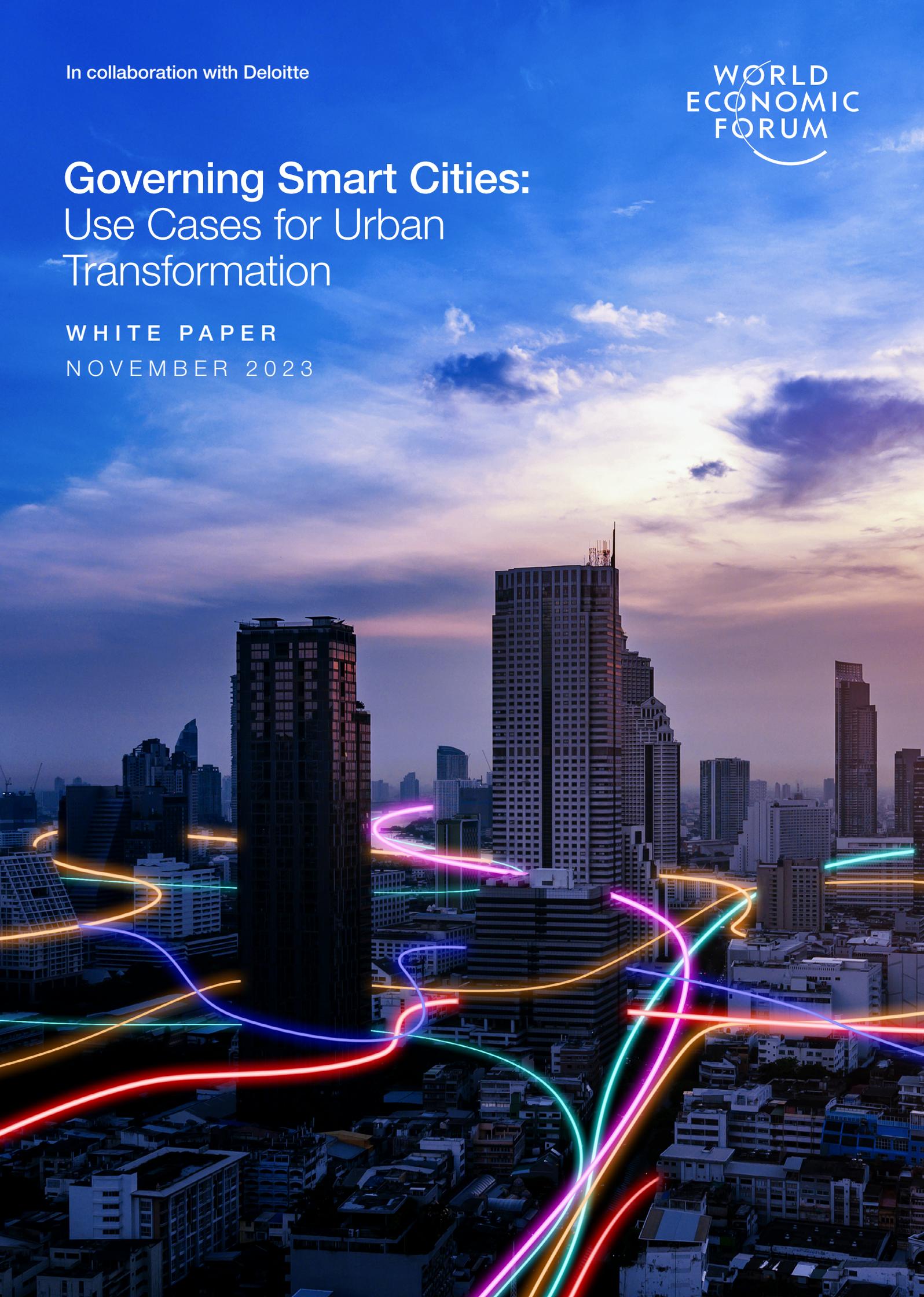


In collaboration with Deloitte



Governing Smart Cities: Use Cases for Urban Transformation

WHITE PAPER
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Foreword



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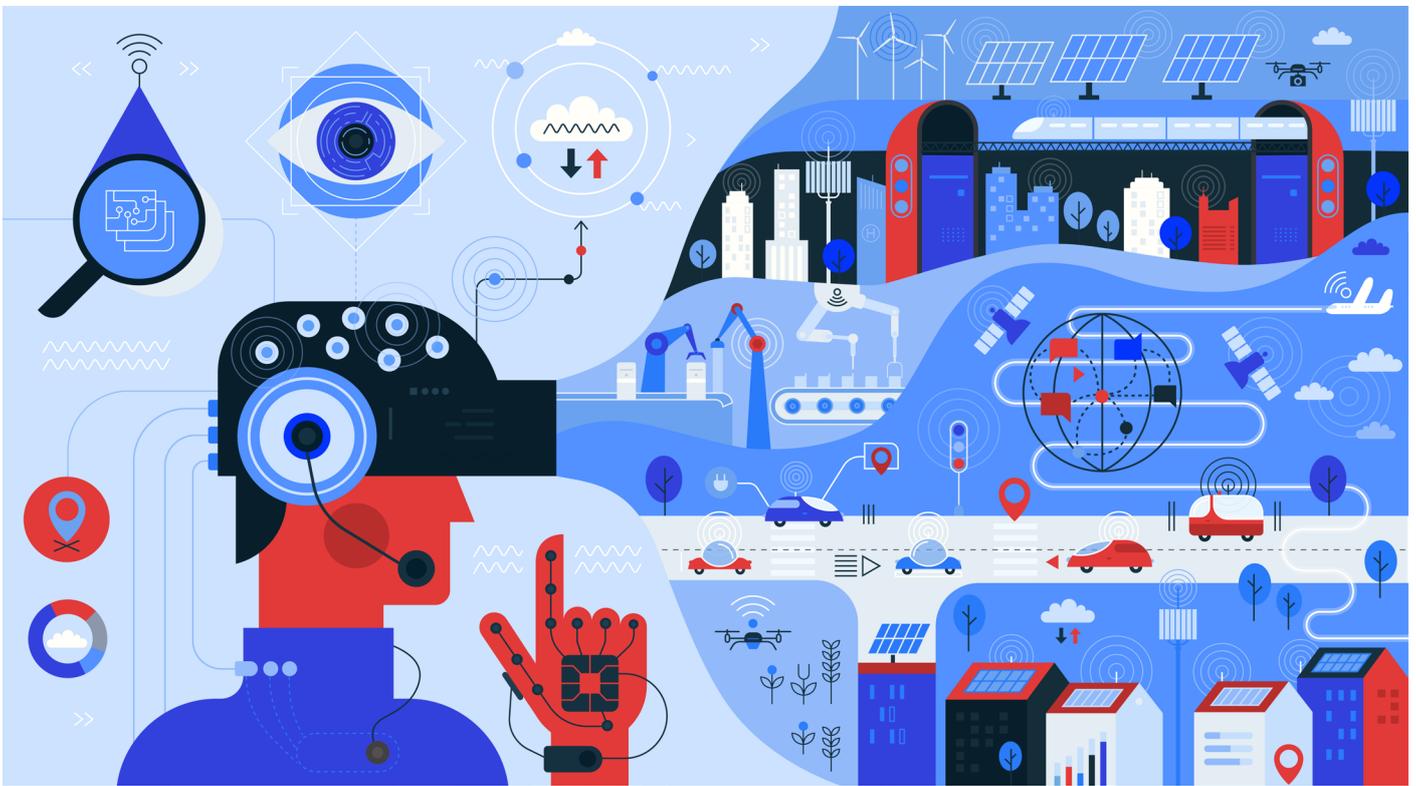
Cities continue to accelerate their use of data and technology at an unprecedented rate. Tools such as digital twins are helping cities increase their resilience in the face of global systemic problems like climate change and pandemics. Rapid advancement in artificial intelligence (AI) brings significant opportunities to transform urban services, including mobility and healthcare, at a time when many cities are adapting to growing populations.

Yet smart city governance has lagged behind this rapid adoption of technology. In our white paper on *Governing Smart Cities: Policy Benchmarks for Ethical and Responsible Smart City Development*,¹ we highlight that many cities, including those considered to be pioneers in the smart city field, lacked the basic governance foundations to safeguard residents against the possible risks and negative impacts of new technologies. For example, 80% of cities surveyed acknowledged legal obligations for privacy and data protection but less than 25% conducted privacy impact assessments when deploying new technologies.

In response to this growing need for support in implementing global technology governance policies, the World Economic Forum's G20 Global Smart Cities Alliance has been working with cities

at both global and regional levels to strengthen their smart city governance. Over the past two years, in collaboration with Deloitte, the alliance has launched and operated regional networks in Japan, Latin America, India and South-East Asia to support the adoption of model governance policies at the local city level. This report presents three case studies from smart cities that have collaborated with the alliance to transform their technology governance in ways that have brought a demonstrable impact on the safety and well-being of their inhabitants.

We extend our heartfelt gratitude to all the cities, partner organizations and stakeholders who have collaborated with us on this journey. We are confident that the findings and recommendations in this report will inspire and guide other cities around the world in their pursuit of safe, smart and sustainable urban development. By fostering effective policy implementation and technology governance, cities can harness the power of technology to create better lives for their residents and build resilient, inclusive and future-ready urban environments.



Executive summary

Many smart cities still lack the basic governance and policies needed to ensure the adoption of technology in a responsible and ethical way. This matters because cities are accelerating the use of digital tools to access real-time intelligence and target interventions to save lives. But such technology brings privacy, equity, accessibility and cybersecurity risks.

The G20 Global Smart Cities Alliance has helped cities leapfrog these challenges by publishing seven model policies in high-priority areas. Since developing model policies is just the first step, the alliance has also developed regional networks in Japan, South-East Asia, India and Latin America to support city leaders in implementing and tailoring these policies to suit the local context. This report profiles three pilot programmes supported by the alliance that tackle three different policy challenges in Mexico City, Tsukuba and Istanbul.

Mexico City: Tackling crime through open data

In 2018, one of Mexico City's most pressing problems was crime – just 7% of inhabitants considered the city safe. The mayor created an open data policy and online information portal, which

made security information on crime – previously classified by the government – publicly available to all residents. The policy has led to an unprecedented level of transparency, allowing anyone to evaluate and contribute to the government's actions across the city, not just on crime.

The alliance's Latin America hub has helped the city improve its open data policy by, for example, providing a strategy on how data could be continuously updated and who should be responsible. The city is now able to present data on its online portal in a more valuable and resident-centric way through 215 datasets spanning 16 categories – from street crime to active COVID-19 cases.

The open data policy has helped NGOs, residents and companies analyse public policy and propose improvements, especially to mobility and crime. Inhabitants have created interactive dashboards analysing traffic accidents, cycling infrastructure and road safety. The city has published data on trends in homicides and crimes, enabling the administration to target high-impact crimes in “red zones”. The city's comprehensive approach to crime reduction, of which open crime data is a key component, has led to a 60% drop in such cases in the past five years. More than 42% of residents now consider their city a safe place to live.

Tsukuba: Putting residents' privacy first

Tsukuba is part of Japan's "Super City" initiative, which aims to upgrade data infrastructure across Japan's cities to improve services, decision-making and quality of life. However, 24/7 data collection risks harming individual privacy and raises fears of surveillance that negate the benefits of city life and discourage individuals from engaging with public spaces.

Given the importance of managing privacy risks throughout the data life cycle, the city has consulted with the alliance on how to implement a policy governing the use of privacy impact assessments (PIAs). By using PIAs to assess and publicize the risks that arise from using personal data, city authorities hope to encourage citizens to feel confident and well-informed when using technology to access services, such as mobility, healthcare and online voting. The city is working with the alliance's Japan regional hub to adapt the alliance's model PIA policy to Tsukuba's specific context.

In terms of expected outcomes, Tsukuba was still implementing its PIA policy at the time of writing. However, according to the alliance's model policy, conducting a PIA can:

- Increase transparency and accountability
- Support public trust
- Mitigate potential privacy harms or disparate impacts before they occur
- Improve compliance and reduce legal risk
- Enable more confident and consistent decision-making about data and technology by city officials, their partners and the public

Istanbul: Ensuring digital technologies are accessible for everyone

In 2015, Istanbul embarked on a comprehensive smart city transformation that aimed to provide online solutions to many necessary processes and services. In 2022, the city participated in the alliance's "inclusive procurement launchpad" project to improve the access of every inhabitant to the digital technology that enables them to fully participate in society.

The municipality realized it needed an information and communication technology (ICT) accessibility policy to ensure its online tools are fully inclusive and accessible, especially for disabled residents.

The city has prioritized: creating a strategic plan; raising the awareness of city officials of the benefits of ICT accessibility; adapting global policies to the local context; reviewing the draft policy with input from a diverse range of residents, private companies and legal experts; and finalizing key performance indicators (KPIs) to measure the policy's impacts.

City authorities anticipate the following outcomes:

- Building awareness of why an ICT accessibility policy is in line with Istanbul's goal of "being smart"
- Framing expectations and standards for how municipal departments purchase and deliver goods and services
- Ensuring the equitable participation of all stakeholder groups in the city
- Improving the digitalization of municipal social services and deliver universally designed, accessible products and services to every inhabitant
- Increasing the number of social services from 800,000 in 2019 to 2.5 million in 2024

Engagement is key

Smart cities must engage residents, civil society and the private sector in creating policies to ensure the technology behind municipal services is responsible, secure and universally accessible. Multiple risks need managing, from protecting personal data to cybersecurity and universal access.

The alliance's seven model policies are invaluable in guiding cities as they frame their own policies, while its regional networks are working with authorities to implement those policies in ways that maximize their impact. Collaboration with industry is urgently needed to support this transition, ensure that cities adopt technology responsibly and help them reach their urban transformation goals.

Introduction

Cities are tackling their governance gaps by adopting smart policies on open data, privacy and accessibility.

Model policies help address risks faced by cities and residents

Although the concept of “smart cities” has existed for nearly two decades, many cities that aspire to be smart still lack the basic governance and policies needed to ensure that technology is adopted in a responsible and ethical way. This is even the case for members of the G20 Global Smart Cities Alliance that are seen as pioneers of the process.

This matters for a number of reasons. As noted in the World Economic Forum’s July 2021 white paper on *Governing Smart Cities: Policy Benchmarks for Ethical and Responsible Smart City Development*,² cities in both developed and developing countries have accelerated their use of digital tools to access real-time intelligence and make targeted interventions to save lives, especially in light of the COVID-19 pandemic. But this creates data privacy, protection and ownership risks for residents. It raises issues of equity, given that those without the right devices or resources to connect to the internet are excluded from accessing important information that might change their lives. There are cybersecurity risks too, as connected cities can be more vulnerable to online attack by hostile actors.

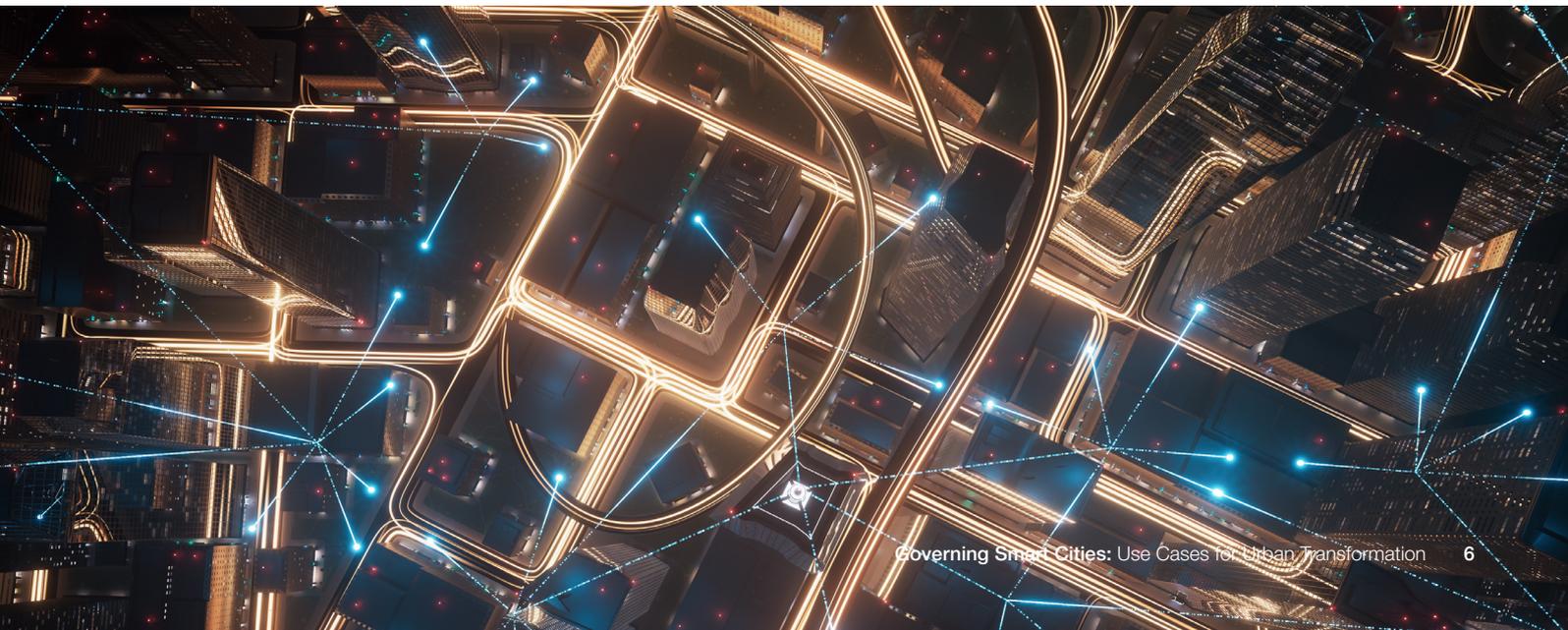
One way that cities can leapfrog these challenges is to learn how leading cities use policy-driven governance to become smarter. To support this process, the alliance has published seven model policies in high-priority areas (see Figure 1).

These have been distilled from the knowledge and experience of the alliance’s pioneer members that have piloted these policies worldwide.

The purpose of this report is to shine a light on some of these pilot programmes that demonstrate the important steps these cities are taking to strengthen their technology governance, supported by the alliance. It profiles three different cities, one each in Latin America, Asia and Europe, and each with their own distinct governance issues:

- **Mexico City, Mexico:** Tackling crime through open data
- **Tsukuba, Japan:** Putting residents’ privacy first
- **Istanbul, Turkey:** Ensuring technologies are accessible for everyone

The report showcases their policy transformations, the challenges they faced in implementing those policies and some key lessons learned. The aim of this white paper is to spur further action by urban and industry leaders to embrace the policies needed to ensure the responsible and ethical adoption of digital technologies – policies that could be viewed as global baselines that every city should have in place.



BOX 1 | **G20 Global Smart Cities Alliance**

The G20 Global Smart Cities Alliance was founded in 2019 to establish norms for the ethical and responsible use of emerging technologies and to address unresolved governance gaps caused by technological advances. The alliance and its partners represent more than 200,000 cities and local governments, companies, research institutes and civil society organizations. The World Economic Forum serves as the secretariat for this alliance.

FIGURE 1 | **The G20 Global Smart Cities Alliance’s seven model policies**



Source: Global Smart Cities Alliance³

How the alliance is supporting cities to become smarter

In 2021, the Forum published *Governing Smart Cities: Policy Benchmarks for Ethical and Responsible Smart City Development* to present the results of a survey on the status of the implementation of model policies in pioneer cities.⁴ The survey revealed some serious gaps across cities of all sizes, geographies and levels of development:

- Less than half of cities have policies to embed basic accessibility requirements into their information and communication technology (ICT) procurement
- 80% of cities acknowledge legal obligations for privacy and data protection but less than 25% conduct privacy impact assessments
- Most cities do not have anyone designated as accountable for cybersecurity and lack a cybersecurity plan that senior executives regularly review or delegate;

- Many cities lack the digital infrastructure needed to support the pandemic-driven shift to remote working and education
- Only 15% of pioneer cities have integrated their open data portals with their wider city data infrastructure

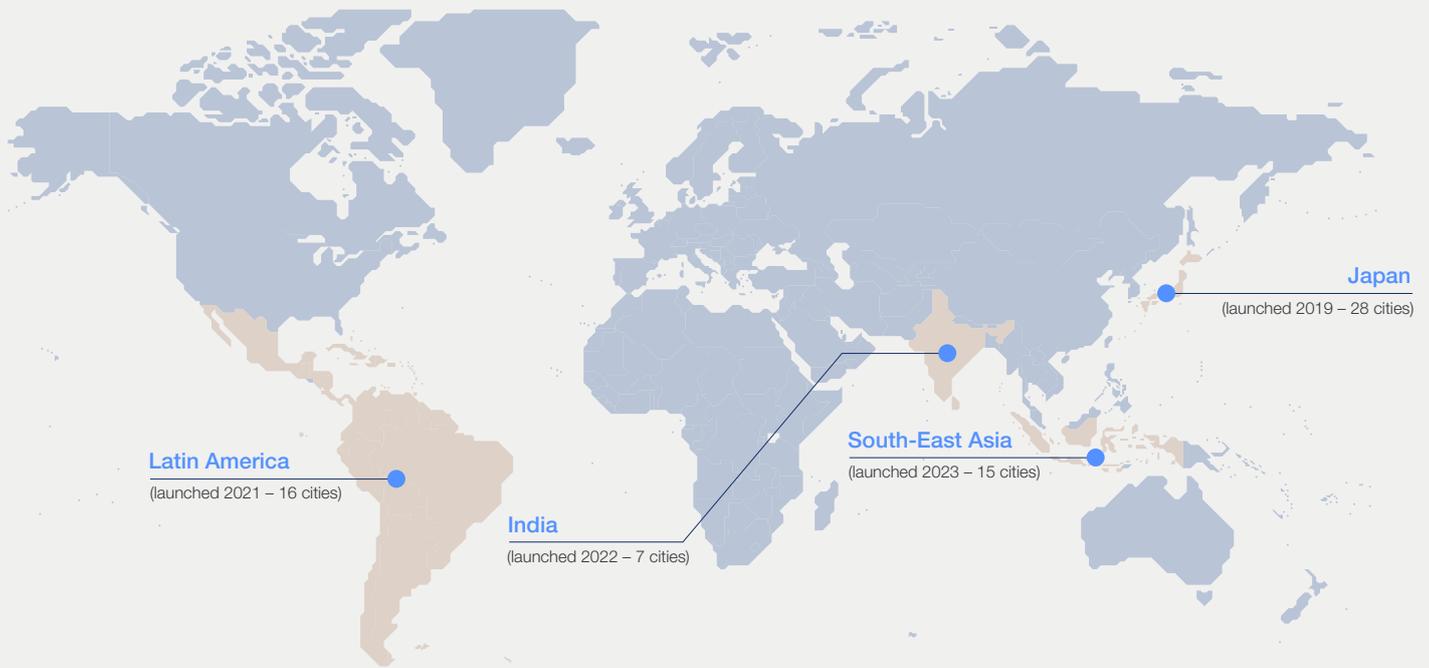
Based on these findings, the paper concludes with a call to action for city leaders to identify gaps in smart city governance before they become material risks and to review their policies accordingly. The alliance’s model policies are a first step in providing cities with the tools to plug these implementation gaps. The alliance has since supported cities at every level to help them tailor these model policies to suit the local context.

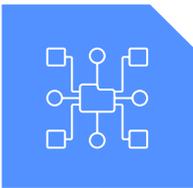
For the model policies to succeed, they must be adapted to regional differences in language, culture, governance structures and technical capacity. The alliance has created regional networks in Japan,

South-East Asia, India and Latin America that bring city officials and experts together to support this process (see Figure 2). Through these networks, the alliance has been able to understand the region's common issues, challenges, priorities and key stakeholders. Next, the alliance has identified target cities, experts and senior sponsors in the region.

Finally, it has formulated a detailed action plan and held community meetings with interested cities and experts to launch the activities of the regional networks. Participation in the networks allows cities to implement model policies more quickly and ensure their relevance to the specific urban situation and its characteristics.

FIGURE 2 The G20 Global Smart Cities Alliance's regional networks





Case Study #1:

Open data in Mexico City

An open data policy helps the city tackle its most pressing problems – from traffic accidents to street crime and public safety.

Overview

As the country's capital and largest conurbation, Mexico City's metropolitan area encompasses more than 20 million residents. The city has promoted various measures to develop an open government movement, including the Law of Operation and Digital Innovation, approved in 2018. Next, the city created the Digital Agency of Public Innovation, which unified the city's digital strategies and developed its first open data policy and online portal.

After Mexico City joined the alliance, the administration adopted a more resident-centric approach to accelerate efforts to improve the use of information available through its online portal. Given the impact that open data has already had on improving Mexico City's crime rate and perceptions of public safety, strengthening the open data policy is a key priority for the city's administration.



What we aim for with the open data strategy of Mexico City is to democratize the access and use of information.

José Merino, Head, Digital Agency for Public Innovation, Mexico City

BOX 2

Defining open data

Open data is a tool to enable better and more responsive government—it isn't an end in itself. Opening data so that anyone can access, use and share it has enabled citizens to better understand how their government is buying services, running

elections and delivering on its commitments, to name just a few examples

Source: Open Data Charter⁵

What is the goal of the policy and why is it important?

When Claudia Sheimbaum Pardo became Mayor of Mexico City in 2018, one of the most pressing problems she faced was street crime. Back then, just 7% of the city's inhabitants considered the city a safe place to live.⁶ She realized she needed a new approach to tackling the problem and open data became a key component in her new strategy.

Much of the security information on street-level crimes was held by the Attorney General's Office and inaccessible to the public. But Mayor Pardo understood that when it comes to a tough problem like crime, everyone – government, academia, civil society – has a role to play in finding innovative solutions. So she resolved to democratize what was previously a monopolistic use of information by the government.

In January 2019, she initiated the city's open data policy, established the Digital Agency for Public Innovation and launched its official data platform, the Portal de Datos Abiertos, to implement the

policy. The two main objectives of the mayor's administration have been innovation in public services and transparency in processes, activities and the information generated by the government.

To deliver this transparency, Mayor Pardo has put open data and open government policies at the centre of her new government model. With this new model, the use and analysis of data has become the main tool in the design of public policies to solve the city's most compelling problems. At the same time, this successful model has achieved an unprecedented openness of data that has allowed anyone to evaluate government actions.

José Merino, Head of the Digital Agency for Public Innovation, puts it like this: "The main objective of the open data strategy of Mexico City is to enable more people to make use of the data generated by the government in a simple and interactive manner. In other words, what we aim for is to democratize the access and use of information."

How has the policy been implemented?

Mexico City has undertaken one of the most ambitious information transparency processes in the region by publishing datasets that had historically been reserved for internal government operations.

Three priority actions

The focus of the open data policy has not been transparency for its own sake but to enable the data to be used and leveraged to help solve the city's problems. Consequently, the open data team's main task is to help other non-governmental actors generate added value from the information. To achieve this, the team has prioritized three particular actions:

1. Dissemination of datasets and the visualization tool

Both the information contained in the datasets and the potential applications for data analysis using the visualization tool have been shared with the general public through short demonstration videos. Additionally, demonstrations of the visualization tool have been conducted in the government secretariats for mobility, women and citizen security to encourage greater use of the data. As a result,

the secretariat for mobility has started using the tool internally to analyse and disseminate information about its activities.

2. Coordination with other data teams

Coordination with other data teams is the main instrument for socializing the importance of open data and technological developments. For example, the teams responsible for the data liaise closely with the open data team at the Digital Agency for Public Innovation, leading to constant improvement in both the information generated by departments and the data culture within their teams. In the government, a specialized open data analysis team collaborates closely with other departments to improve existing policies and propose new policies to solve specific problems, mainly in the areas of mobility and security.

3. Daily monitoring of data use

The open data team conducts daily monitoring of how residents use the datasets. This monitoring involves identifying news articles, academic research, public policy applications and other products and investigations that use the data obtained from the portal. In this way, the team can evaluate the impact that the new open data strategy has had on the use and reuse of the information.

These priority actions collectively aim to ensure that the revised open data policy remains an internal document and truly transforms the culture and practices of open data among government teams by promoting awareness, collaboration and the creation of value-added solutions using the available data.

Role of the alliance's model policies and regional hub

Despite having a large amount of open data, Mexico City's administration recognized that it lacked a medium- and long-term strategy for public disclosure. So it joined the alliance to access support for developing its policies and strategies. The alliance's Latin American hub has helped the city align its policies with global best practices and standards and improve its open data portal.

First, the administration, with support from the alliance, formulated a statement of intent that stated how it would improve its existing open data policy and implement it by developing an open data portal. The administration strengthened its open data policy through a comparative analysis with the alliance's model global policy. For example, the model policy provided a strategy on how data would be continuously updated and who should be responsible. The administration then created a workplan to update its open data portal, incorporating insights from the alliance alongside feedback from residents, civil society and government agencies.

Since joining the alliance, Mexico City has been able to create a clear vision to improve its open data policy and a workplan to deliver on this vision. This has allowed the city to present data through its online portal in a more valuable and resident-centric way. The portal now consists of around 20 categories and well over 200 datasets, including, for example, a COVID-19 category with 24 datasets capturing active cases in Mexico City at the neighbourhood level, as well as reports on water supply, violence against women, demographics, employment, education and tourism. The portal is constantly updated with new datasets and categories.

Securing cooperation from government departments and civil society

One of the biggest challenges in implementing the open data policy was working with government departments that were hesitant to release information due to data privacy, security and misuse

concerns. In such cases, the city's administration took a two-phase approach. First, they presented the benefits of open data sharing as an opportunity to improve government transparency. They then highlighted that, under the Law of Operation and Digital Innovation, public entities were obliged to share certain types of data on the portal and non-compliance could result in fines. Nevertheless, the administration worked collaboratively with government departments and sought legal advice to establish protocols for data sharing that address privacy and security concerns.

The administration also realized the importance of building relationships with non-governmental stakeholders when implementing the open data policy. If representatives from civil society, academia and journalism cannot use the data, then an open data strategy would not have much impact. Therefore, it has proved vital to work closely with these sectors to ensure that data is effectively used and becomes a valuable tool for the city and its inhabitants.

Role of internal champions

Since the establishment of the Digital Agency for Public Innovation, both José Merino, the agency's head, and Eduardo Clark, the Director-General of Digital Government, have understood the importance of information openness for improving public administration. Consequently, they have been driving efforts to consolidate a strong and innovative open data strategy. In particular, Clark's dialogue and collaboration with various government stakeholders have been crucial in opening up some of the most impactful datasets, especially in the areas of security and mobility.

When it comes to daily operational tasks, the city's open data team consists of Santiago Martínez and Irving Martínez. Over the past 18 months, they have managed the open data portal and developed the visualization tool, along with technical tasks such as data cleaning and processing, gathering requirements for the web development team, automating processes through application programming interfaces (APIs) and other information transfer protocols, and creating technical annexes and best practice manuals.

In addition, the open data team maintains relationships with data-owning departments, fosters collaboration among civil society organizations, academia and public institutions for data openness, and supports the project's dissemination and socialization plan.



What are the policy's impacts?

“ In 2018, just 7% of Mexico City's inhabitants considered the city a safe place to live – by 2023, that figure had climbed to 42.5%.

Strengthening the city's open data policy has become a priority for the current administration, which views the transparency and public accessibility of information as a central pillar of government. Before the end of its term in 2024, the administration aims to consolidate both the open data policy and portal to ensure future administrations maintain it with the same level of rigour.

The open data strategy has proved especially useful to NGOs and enthusiastic residents with a wide variety of interests, who have built new tools using this data to analyse public policy and propose improvements. Datasets for monitoring traffic accidents and crime have proved especially useful.

The secretariat for mobility publishes unprocessed raw data on the open data portal as well as its own analysis report every quarter. Building on this, inhabitants have created a number of interactive dashboards to analyse road safety, particularly for cyclists. The Mapa Ciclista,⁷ for example, displays all the city's cycling infrastructure. And the Mapa Interactivo de Hechos de Tránsito⁸ is an interactive map of traffic events. These maps, made by residents with access to open source data and code, have pushed the government to implement its own websites to meet those needs. Currently, the secretariat for mobility is working on an improved and official website that will make its analysis of traffic accidents accessible to everyone.

Crime and public safety have improved with Mexico City's comprehensive security strategy, which is enhanced by its new approach to open data. The city administration's official online Statistical Monitor publishes a dashboard of data organized under five main pillars: security and justice, welfare, population and government, economy and finance, and tourism.⁹ Under security and justice, the information includes seven years of updated data trends on the homicide rate, high-impact crimes and changing public perceptions of security.

Through this publication of open data and subsequent analysis of data on crime events, emergency calls and reports by residents, the city administration has designed a security strategy focused on high-impact crimes in “red zones” of the city, enabling authorities to reduce criminality in those areas. The Portal de Datos Abiertos (open data portal) details the number of high-impact crimes held in the investigation folders of the Fiscalía General de Justicia (Attorney-General's Office – FGJ). From 6,708 cases in October 2018, the numbers declined steeply to 2,500 cases in March 2023 – a drop of over 60%.¹⁰ The portal also features a complete database of investigation files from the prosecutor's office, which can be disaggregated and filtered by crime.¹¹

Since that low point in 2018, when just 7% of the city's inhabitants considered the city a safe place to live, by 31 March 2023, that figure had climbed to 42.5%.

As well as the government's internal use of open data to improve the quality of life for residents, there are several cases of private companies that have used the open data published by Mexico City for analysis and even to develop web applications. One successful case is the Hoyo de Crimen (crime hole) app, which uses street-level crime data so that anyone can design their daily route and avoid those points or areas with a high incidence of crime.

To date, over 100 references and uses of the portal's datasets have been identified. But with over

450 open datasets published by the government online, there is huge potential for residents and companies alike to add further value to the raw data through their own analysis and apps.

Mexico City plans to use the alliance's network to promote collaboration with experts and other cities across Latin America. While the city's main aim is to improve its own policies, it also wants to showcase its open data platform by sharing source code to help accelerate open government efforts.

BOX 3 Mexico's global role in promoting open data

Mexico is an important global and regional player in the open data community. It has helped develop the International Open Data Charter (IODC)¹² and the G20 Anti-Corruption Open Data Principles.¹³ The country is also a founding member of the

Global Partnership for Sustainable Development Data,¹⁴ which aims to promote the use of open data to contribute to achieving the Sustainable Development Goals (SDGs).

FIGURE 3 Summary – Mexico City's experience piloting an open data policy

Greater Mexico City

Making data open to all

20,000,000
Population

1,485 km²
Area



Goal

Enable inhabitants, NGOs, companies to access datasets about e.g. crime, accidents, mobility, promote transparency and boost collaboration on innovative solutions

Solution

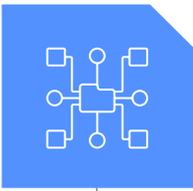
Transform existing Open Data policy and create a strategy to disseminate information better through an online portal

Impact

- Open data policy that aligns with global best practice with over 200 accessible datasets
- Local government action in “red zone” areas led to 60% drop in high-impact crimes
- 42% of inhabitants now consider the city a safer place, up from 7% in 2018

Going further

Working with other cities throughout Latin America and sharing source code to transform open data policies



Case Study #2: Data privacy in Tsukuba City

Putting resident privacy and consent at the heart of data collection and sharing in Tsukuba City.

Overview

Located in Ibaraki Prefecture in central Japan, Tsukuba has been a technology centre since the 1960s and is home to the Tsukuba Science City, a hub of leading research institutions and universities. With 250,000 inhabitants, Tsukuba's legacy of innovation continues to grow through membership in Japan's Super City initiative, a digital transformation programme to upgrade data infrastructure across Japan's cities to improve services, decision-making and quality of life.

The city's designation as a Super City – part of the national strategic special zones programme launched in 2022 – envisages developing urban data platforms that allow the wide sharing of multi-sectoral data, facilitating public-private collaboration in addressing all aspects of the resident's life.

Given the importance of maintaining privacy during data collection, the city consulted with the G20 Global Smart Cities Alliance on how best to create and implement a policy governing the use of privacy impact assessments (PIAs).

Japan's Super City initiative

Super City is an initiative of the Government of Japan¹⁵ that aims to realize a society in 2030 from a resident's perspective and with the participation of inhabitants by:

- Providing cutting-edge services with data analysis technologies in a wide range of sectors covering all aspects of a resident's life (e.g. government services, mobility, healthcare, education)
- Developing urban data platforms that allow multi-sectoral data connection and data sharing
- Promoting comprehensive regulatory reform to enable cutting-edge services



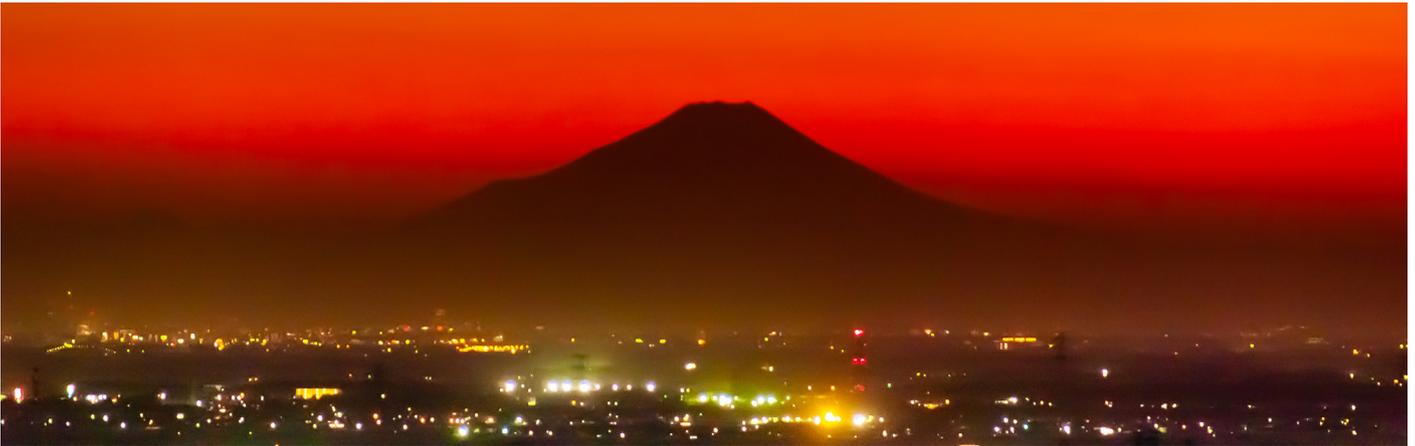
People who need services utilizing advanced technology, such as the elderly, generally have limited knowledge and ability to use digital technology. For them to use these services with safety, a mechanism is needed, like PIA, to properly evaluate risks.

Hideyuki Nakayama, Chief Smart City Officer, Tsukuba City

The collection of data occurs in everyday city operations, from paying a utility bill to browsing a web page and, increasingly, walking down a city street, riding public transit or driving on a city-maintained road. The use of smart city technologies – such as sensors, connected devices and always-on data flows that manage transportation systems, support real-time infrastructure maintenance, automatically administer public services, enable transparent governance and open data, and support

emergency services in public areas – can provide real benefits to governments and communities. While well-intentioned, they can also create the risk of individual privacy harms and raise fears of surveillance that negate the benefits of city life and actively discourage individuals from engaging with public spaces.

Source: World Economic Forum, Privacy Impact Assessment Model Policy¹⁶



What is the goal of the policy and why is it important?

As part of its Super City initiative, Tsukuba plans to provide services using cutting-edge technologies in six fields: mobility and delivery; government; medicine and welfare; safety, resilience and infrastructure; digital twin; and open hub (see Figure 4).

Delivering these sophisticated services requires authorities to use personal data. The city has established principles – such as “no harm” – to allay residents’ concerns about the safety and transparency of data systems and the security of their personal data. Given such systems are expected to be widely used, city leaders need to demonstrate that residents are always at the centre of implementing advanced technologies in the community.

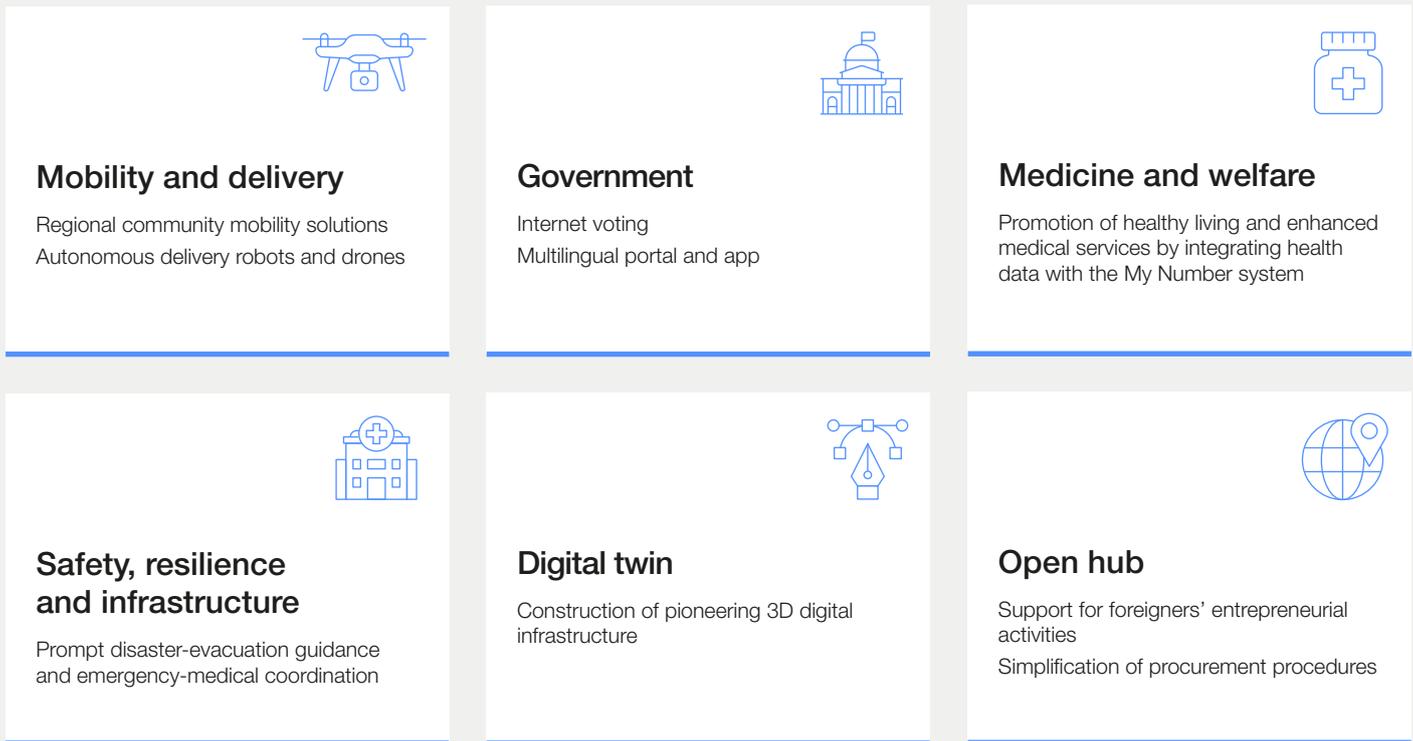
Tsukuba has therefore taken steps to implement a privacy impact assessment (PIA) policy based on global best practice. A PIA consists of a set of processes to identify and manage privacy risks throughout the complete data life cycle, from collection through to disposal. By assessing and publicizing the risks that arise in the process of acquiring and using this data, the authorities aim

to create an environment in which residents feel confident to use these services, having properly understood and evaluated the risks to their data privacy.

Hideyuki Nakayama, Chief Smart City Officer, and members of the Science Technology Strategy Division are promoting the project. According to Nakayama: “Tsukuba City aims to be a city that leaves no one behind and wants to bring diverse happiness through the implementation of advanced technology and services. On the other hand, people who need services utilizing advanced technology, such as the elderly, generally have limited knowledge and ability to use digital technology. In order for such individuals to use the services with safety, a mechanism is needed, like PIA, to properly evaluate risks.”

In the spirit of “leave no one behind”, the city aims to connect residents and government, bring out each inhabitant’s different abilities, integrate world-class science and technology, and become a super city that enables residents to cooperate in solving social problems.

FIGURE 4 | Tsukuba Super Science City – Six services powered by open data



Source: Government of Japan¹⁷

How has the policy been implemented?

Role of the alliance's model policies and regional hub

While there were concerns in Japan, as in other countries, about the risks associated with the potential mishandling or leakage of residents' personal information, there were no clear government guidelines or laws to address these issues. Consequently, Japan's national government, which had already proposed its own "Super City" concept, sought the support of the alliance.

The alliance has played a key role in helping Tsukuba develop its PIA policy. First, it introduced city leaders to examples of municipalities that have implemented PIAs. For example, in Europe, PIA implementation is required by law, such as the General Data Protection Regulation (GDPR). In the United States, municipalities implement PIAs based on their own ordinances and similar regulations.

The alliance then proposed that Japan could draw on its *Privacy Impact Assessment Global Model Policy*, which could provide guidance on PIA implementation for all cities participating in the Super City concept.

Involvement of diverse voices and key questions for discussion

In Japan, the Personal Information Protection Act provides some guidance for privacy assessments. But PIA implementation in Tsukuba requires an additional legal basis such as a municipal ordinance. To address this need, the city hall has established a discussion group composed of legal experts, privacy policy specialists, university professors, municipal officials and residents. It is broad enough to ensure diverse opinions.

The group also includes private sector involvement in the form of an insurance company actively supporting the city in developing its PIA policy by designing an evaluation system to analyse risks to privacy arising from the process of acquiring, using, storing and disposing of private information.

The discussion group's principal aim is to create a comprehensive PIA implementation ordinance that will balance the benefits of data linkage infrastructure with residents' privacy concerns. By holding discussions involving stakeholders from an early stage, city leaders hope the group will promote and disseminate a wider public understanding of the city's approach to policy implementation.

At the outset, city leaders explained the Tsukuba Super Science City Initiative to participants to deepen their understanding of the city's future. By explaining that data protection is expected to be an issue in urban development, city authorities aim to underline the significance of the PIA and the need for participants to reach a common understanding of its significance.

The group's discussion are informed by the alliance's model PIA policy, which covers the objectives, foundations and fundamentals of a privacy impact assessment.¹⁸ Discussions – which were ongoing at the time of writing this paper – focus on the following themes and questions:

- **Purpose:** What is the challenge? Why is a PIA necessary?
- **Definitions:** What is privacy? What is the target area?
- **Evaluation:** How do we evaluate PIA outcomes? Who conducts the evaluation? Which evaluation criteria are necessary (e.g. based on experience of other cities like Helsinki)?

- **Publication:** How do we announce the results of the PIA to the public?
- **Sanctions:** What kinds of penalties are appropriate for those who refuse to provide the necessary information?

The alliance's Japan regional hub has worked with the Tsukuba city authorities to help them adapt the model PIA policy to the municipal context. As Fumikazu Kitagawa, partner at Deloitte Japan, puts it: "The work we do through the regional hubs is where the action happens. We help turn international best practice into locally specific policies that make smart cities more data-driven, people-centric and future-ready."

The city is committed to providing a forum for discussion in which the general public finds it easy to understand the issues and express their opinions. Public buy-in is expected to be very important in promoting the entire Smart City agenda in general and the PIA in particular.

What are the policy's impacts?

Tsukuba is still in the process of implementing its model PIA policy. Consequently, its true impact will only be evident once the policy has been effectively operationalized. Nevertheless, according to the alliance's model policy, conducting a PIA prior to the acquisition or use of technologies in a smart city can:

- Increase transparency and accountability
- Support public trust
- Mitigate potential privacy harms or disparate impacts before they occur
- Improve compliance and reduce legal risk

- Enable more confident and consistent decision-making about data and technology by city officials, their partners and the public

The implementation of the model PIA policy, with Tsukuba at its centre, may also have a significant impact on Japan as a whole. There are two reasons for this. First, PIA is not common in Japan, so this implementation process serves as the pioneering initiative. Second, Tsukuba has been adopted as a Super City and other municipalities are expected to use Tsukuba as a reference in building their own PIA policies based on the alliance's model policy in the future.



We help turn international best practice into locally specific policies that make smart cities more data-driven, people-centric and future-ready.

Fumikazu Kitagawa, Partner, Deloitte Japan



Tsukuba City

Putting citizen privacy first

250,000
Population

284.1 km²
Area




Goal

Enable city leaders to conduct privacy impact assessments (PIAs) on the introduction of new digital technologies and build public buy-in to ensure the success of data-enabled municipal services



Solution

Develop a local ordinance that permits the use of PIAs, based on the alliance's model PIA policy



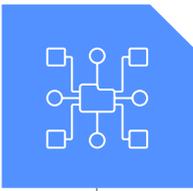
Impact

- Increase transparency, accountability and public trust in city authorities
- Mitigate potential privacy harms before they occur
- Enable leaders to deliver large-scale digital transformation to improve data infrastructure and maintain trust



Going further

Plans to apply the privacy impact assessment policy to other areas across the city beyond data infrastructure, with other Japanese cities expected to follow



Case Study #3:

Accessible information and communication technology in Istanbul

Istanbul's new information and communication technology (ICT) accessibility policy aims to deliver more inclusive social services to people with disabilities.

Overview

Istanbul is the largest city in Türkiye and has a population of over 15 million – 19% of the country's total population. The city municipality embarked on a comprehensive smart city transformation initiative in 2015, powered by 5G technology and the internet of things (IoT). The city's aim is “to minimize the processes Istanbulites go through with public bodies, providing online solutions to many operations and rendering the city more accessible.”¹⁹

Istanbul has been a member of the World Economic Forum's G20 Global Smart Cities Alliance since

2019 to raise awareness of the importance of technology governance in cities. In June 2022, the city participated in the Inclusive Procurement Launchpad project,²⁰ initiated by the alliance and one of its members, the Global Initiative for Inclusive ICTs (G3ict).²¹ The project aims to support technology procurement for more inclusive cities worldwide, with a special focus on including people with disabilities. The project recognizes that technology can play a key role in enabling individuals to fully participate in society, yet not every resident in Istanbul has the same level of access to that technology.



Istanbul Metropolitan Municipality is working hard to transform Istanbul into a beacon of accessibility and inclusivity, and creating an accessible ICT procurement policy has been a key milestone in achieving our goal.

Erol Ozguner, Chief Information Officer, Istanbul Metropolitan Municipality



What is the goal of the policy and why is it important?

At the heart of the strategic plan for Istanbul Metropolitan Municipality (IMM) are 10 core values, including human focus, inclusivity and accessibility. The city requires its municipal services to be provided according to these principles and in a way that meets the needs of different population segments. The city's overarching goal is to ensure the satisfaction of all city residents in the provision of municipal services and to carry out those services within the framework of universally accepted legal and social norms.

Istanbul's municipal authorities were particularly concerned by reports that people with disabilities were encountering serious problems in accessing important information online. Questions were raised about whether the municipality had audited the accessibility of its web pages. In this context, the municipality decided to analyse the needs of all Istanbul's residents in line with the themes of "participatory and innovative management" and "sharing Istanbul".

In particular, the city's authorities aimed to address the risk that their services for people with disabilities could not be managed holistically due to the lack of inter-departmental cooperation and coordination, which was aggravated by poor ICT accessibility. According to the Organisation for Economic Co-operation and Development (OECD), "one in seven working-age adults identifies as having a disability in OECD countries, a share that is also substantial and growing among young people."²²

Therefore, as part of its policy goal to support more inclusive services for people with disabilities and to ensure their participation in social life, the municipality realized it needed an ICT accessibility policy to make sure its online tools – including websites, applications and social media channels – are fully inclusive and accessible, especially for disabled residents, who are often described as the "largest minority" in the world.

The goal of the ICT accessibility policy is to make every ICT service provided to Istanbul's residents and visitors accessible. Adopting this policy is seen as a crucial step in creating an accessible ICT ecosystem in Istanbul and realizing IMM's mission.

Erol Ozguner, IMM's chief information officer, puts it like this:

"A fair, green, and creative city; happy people of Istanbul – for Istanbul Metropolitan Municipality, this has been our vision since 2019. Central to achieving our vision is accessibility, a core value of our institution. No city can claim to be a smart city without taking into account the needs and desires of persons with disabilities. We, as IMM, believe that it is the municipality's responsibility to provide innovative and empowering urban solutions to the problems of persons with disabilities. It is our responsibility to create an accessible ICT ecosystem throughout Istanbul. IMM is working hard to transform Istanbul into a beacon of accessibility and inclusivity, and creating an accessible ICT procurement policy has been a key milestone in achieving our goal."

How has the policy been implemented?

Istanbul's municipality has been working closely with G3ict on the implementation of its ICT accessibility policy. The city's work plan includes the following steps.

Preparation and raising awareness

- Create a strategic plan and build a team to deliver the policy
- Raise awareness among city officials of the need for and benefits of ICT accessibility
- Localize global policies
- Adapt global ICT accessibility policies of the alliance and G3ict to align with domestic context, law and regulatory frameworks
- Draft the ICT accessibility policy based on input from a diverse range of Istanbul's stakeholders

Review and finalization

- Review of the policy by the municipality's legal team
- Finalize policy with key performance indicators (KPIs) to measure impact

Raising awareness among city officials

For ICT accessibility policies to be successful, it is essential to raise awareness among city officials so that leaders and decision-makers understand both the need for and the benefits of accessible ICT across all departments.

Istanbul's ICT accessibility policy was created under the guidance of the city's mayor, the heads of the IT and accessibility departments and the directors of Istanbul Smart City. The team that the municipality created to fashion the policy includes people with disabilities working in the IT directorate who have first-hand experience trying to make the municipality's online services more accessible.

Other members of the team include experts on accessibility and disability awareness who have been active in educating municipal employees and Istanbul's residents. The rest of the team is comprised of Smart City directorate employees who are working mostly on synthesizing accessibility and technical knowledge and coordinating the different directorates.

The municipality has developed a comprehensive training programme in tandem with the accessible ICT policy that will better equip all municipal actors to ensure ICT procurement is on an accessible path. The training programme's leaders will engage experts to ensure that municipal employees in all departments adopt the policy more widely.

Istanbul is also one of the founder cities of the B40 Balkan Cities Network, which includes more than 50 Balkan cities.²³ Through forums such as this, Istanbul aims to introduce its ICT accessibility policy and its benefits to a wider range of cities that are willing to engage in the process. Istanbul's engagement in the network provides an opportunity for member cities to construct their own local ICT procurement policies and to understand the challenges and impacts of the policy across different geographies and urban ecosystems.

Localization of the alliance's global model policy and stakeholder involvement

While model global ICT accessibility policies created by the alliance and G3ict already existed, Istanbul's authorities needed to "localize" these policies for the specific context. The municipality instructed its in-house legal experts to adapt the global model policies to align with Turkish law, as well as to account for the specific regulatory frameworks and needs of Istanbul.

A high priority for the team was to include the perspectives of a wide range of stakeholders, both experts and regular residents. The team invited people with disabilities into the department to participate in the discussion. They also invited private companies, including technology providers and start-ups, to participate. This has helped ensure that the ICT accessibility policy is practical, effective and takes account of the needs and views of all residents and enterprises.

What are the policy's impacts?

As of May 2023, the policy was in its final stage of development, with discussions on which KPIs would best measure its impact following implementation, as well as how to expand the policy to other municipal departments beyond IT and ICT procurement.

One of the KPIs under consideration is to measure the “number of annual services provided in the field of social services”. As part of the city’s wider strategic plan, the target is to increase the number of such annual services from around 800,000 in 2019 to 2.5 million in 2024. The municipality expects that its new ICT accessibility policy will improve the digitalization of municipal social services to provide a greater number of high-quality services.

More broadly, city authorities expect the following outcomes from the policy:

- Building awareness of why an ICT policy that makes technology and procurement accessible to everyone, especially people with disabilities, is in line with Istanbul’s goal of “being smart”
- Framing expectations, standards and criteria for how municipal departments are to purchase and deliver goods and services
- Ensuring the equitable participation in this process of all stakeholder groups in the city
- Delivering universally designed products and services to all residents

FIGURE 6 Summary – Istanbul’s experience piloting an ICT accessibility policy

Istanbul

Ensuring technologies are accessible for everyone

15,460,000

Population

5,461 km²

Area



Goal

Ensure every ICT service provided to Istanbul’s residents and visitors is fully accessible, especially for disabled people

Solution

Create an accessible ICT procurement policy

Impact

- Improve the digitalization of municipal social services and deliver universally designed, accessible products and services to every inhabitant
- Increase the number of annual social services from around 800,000 in 2019 to 2.5 million in 2024

Going further

Development of a comprehensive training plan to ensure the successful embedding of the policy across the municipality

Conclusion

Smart cities must engage residents, civil society and the private sector in creating policies to ensure that the technology behind municipal services is responsible, secure and universally accessible.

As the world continues to accelerate its use of digital tools and artificial intelligence to deliver goods and services, the governance of smart city technologies is becoming an increasingly important priority.

Multiple risks need managing. Residents harbour deep concerns about whether authorities can be trusted to ensure their personal data remains protected and private. Equity – which means ensuring that all people have access to the online services they need – is a top priority, in line with the smart city principle to “leave no one behind.” And cybercrime threatens every smart city, since the more connected they become, the greater the risk of an attack.

Some cities are taking important steps to put in place policies that protect their residents and systems, while also ensuring that the data essential to enhancing urban living becomes more transparent and accessible. The case studies featured show how seriously leaders in Mexico City, Tsukuba and Istanbul are taking their duty to ensure more responsible adoption of technology.

However, most cities need to do much more to accelerate the pace of governance in line with the pace of technological change. Data from the World Economic Forum’s research shows that a

majority of cities have yet to embrace accessible ICT procurement, privacy impact assessments or integrated open data portals. Most cities have not even designated someone as accountable for cybersecurity.

City leaders urgently need to review their policies around the use of data and technology to identify gaps before they become risks. The seven model policies of the G20 Global Smart Cities Alliance have proved invaluable in guiding leaders towards best-practice protocols. But policies alone will not achieve anything unless they are implemented. This is where the alliance’s regional networks in Japan, South-East Asia, India and Latin America are proving essential. These hubs bring city officials and experts together to transform the alliance’s global policies into practical tools suited to the local context of municipalities all over the world.

This process cannot succeed without the active participation of residents, civil society organizations and the private sector. Technology companies can bring their knowledge and solutions to improve data governance in cities through public-private collaboration. It is more important than ever that city leaders engage with industry to support them in adopting technology more responsibly and achieving their urban transformation goals.

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