



VISA



CITIES THAT THRIVE

PUBLIC FINANCIAL INNOVATION AS
A CATALYST FOR URBAN RESILIENCE



TABLE OF CONTENTS

Our approach	4
Participating cities	5
Glossary	6
Executive summary: Cities that Thrive	7
PART 1:A NEW PARADIGM FOR URBAN RESILIENCE	9
What does urban resilience matter?	11
Which systemic resilience challenges most concern city officials?	13
Why are public financial technologies an important resource for improving urban resilience?	15
How can cities enable public financial innovation?	16
The emerging opportunity to address urban resilience goals	18
PART 2: ACTIONS FOR CHANGE: CITIES LEADING PUBLIC FINANCIAL INNOVATION FOR URBAN RESILIENCE	19
A necessary first step: Integrating public financial technologies into city resilience strategies	24
Digital tax and fee collection: A springboard for further innovation	27
Digital payments to people and business: Supporting city communities	32
Digital public finance and purchasing: Creating resilient local economies and diversified government supply chains	36
Digital financial SMB support and enablement: Helping local economies flourish	40
Digital financial and payments data insights: Improving resilience policy, planning, and delivery	41
PART 3: BARRIERS TO ADOPTION AND WAYS FORWARD	47
Barriers	50
The Path Forward: Targeted actions to unlock city resilience	52
Conclusion_	57

ABOUT THIS REPORT_

This report was prepared by StateUp in collaboration with Visa and Resilient Cities Network. Findings and suggested actions are based on in-depth interviews, a survey of city officials, and desk research conducted by StateUp, working with Visa and Resilient Cities Network, as well as our long-run work with government agencies around the world and with the broader public-purpose technology innovation ecosystem.

The information provided in this report is for informational purposes only and should not be relied on by third parties. This report does not in any way represent advice, recommendations or otherwise.

All case studies, comparisons, statistics, research, recommendations, or information in this report (the "Information") are provided "AS IS" and intended for informational purposes only and should not be relied upon for operational, marketing, legal, investment, technical, tax, financial or other advice. You should consult with your advisors to determine what laws and regulations may apply to your circumstances.

StateUp/Visa/Resilient Cities Network make no representation (whether express or implied) or give any warranty regarding the suitability, accuracy or completeness of the Information in this report and that matters which may affect third parties are not addressed in the report and any liability is therefore hereby expressly excluded to the maximum extent permitted by the applicable law. Any reliance third parties choose to make on the Information is a matter of their judgment exclusively and independently. Furthermore, the Information contained herein is subject to change or amendment without notice.

The actual costs, savings and benefits of any recommendations or programs may vary based upon your specific organizational needs and program requirements. By their nature, recommendations are not guarantees of future performance or results and are subject to risks, uncertainties and assumptions that are difficult to predict or quantify. StateUp/Visa/Resilient Cities Network are under no duty to update or revise this report in any way.

All intellectual property rights, including but not limited to copyrights, and the ownership and title to this report and the information contained therein are owned by and vest exclusively in Visa. Third parties shall not have nor acquire any rights in such intellectual property and shall not copy, distribute or make any other use of the report and the Information contained therein.

These materials and best practice recommendations are provided for informational purposes only and should not be relied upon for marketing, legal, regulatory, or other advice. Recommended marketing materials should be independently evaluated in light of your specific organizational needs, operations, and policies as well as any applicable laws and regulations. StateUp/Visa/Resilient Cities Network are not responsible for your use of the best practice recommendations or other information, including errors of any kind, or conclusions you might draw from their use.

OUR APPROACH_

Unique data

Our unique dataset and qualitative research is grounded in the experiences of city teams and leaders. We map the challenges they face and illuminate novel case studies, sometimes in challenging circumstances, of engaging public financial innovation to make cities more resilient to critical shocks and stresses. The report also presents **actions that can further empower cities to engage public financial technologies to meet critical needs, based on our in-depth research and co-creation with city leaders and other key stakeholders.**

Digital as a tool, not an end

Approaches to addressing complex challenges necessarily require a combination of policy, technological, and behavioral levers. In this report, our key focus is on technological tools, but we do not treat them in a silo. As our suggested actions show, evidence-based policymaking, behavioral change, and digital adoption are mutually reinforcing, together enabling innovative approaches to tackling major public needs.

City participation in numbers

More than 30 cities were engaged through survey research and individual semi-structured interviews. We engaged city officials in both city Resilience Teams (primarily Chief Resilience Officers), and Digital, Data, and Innovation Teams (primarily Chief Data or Digital Officers). This included interviews with the Chief Resilience Officer and other relevant city officials from cities including Athens (Greece); Broward County (USA); Cape Town (South Africa); Mexico City (Mexico); San Antonio (USA); and Santa Fe (Argentina). Interviews were also conducted with digital, data, and innovation officials and related stakeholders in cities including Copenhagen (Denmark), Kyiv (Ukraine), London (UK), and Tel Aviv (Israel).

30 cities participated in the survey research, including four cities from Africa, six from the Asia Pacific region, five from Europe and the Middle East, eight from Latin America and the Caribbean, and seven from North America. The list below displays all cities engaged through interviews and survey responses for this research.

PARTICIPATING CITIES



4

Africa

Cape Town, South Africa
Matola, Mozambique
Lagos, Nigeria
Zanzibar, Tanzania

6

Asia Pacific

Kyoto, Japan
Melbourne, Australia
Penang, Malaysia
Pune, India
Surat, India
Wellington, New Zealand

10

Europe and Middle East

Athens, Greece
Copenhagen, Denmark
Glasgow, UK
Greater Manchester, UK
Kyiv, Ukraine
London, UK
Rotterdam, Netherlands
Tel Aviv, Israel
Thessaloniki, Greece
The Hague, Netherlands

8


Latin America & Caribbean


Mendoza, Argentina
Mexico City, Mexico
Montevideo, Uruguay
Porto Alegre, Brazil
Rio de Janeiro, Brazil
Santa Fe, Argentina
Santiago, Chile
Tres de Febrero, Argentina

8

North America & Caribbean

Broward County, USA
Calgary, Canada
City of Norfolk, USA
Coral Gables, USA
Oakland, USA
Miami-Dade County, USA
San Antonio, USA
Washington, D.C., USA

 Interviews with the Chief Resilience Officer and other relevant city officials

 Interviews with digital, data and innovation officials and related stakeholders

CORE TERMS_

Urban Resilience: the capacity of a city's systems, businesses, institutions, communities, and individuals to survive, adapt, and thrive, no matter what chronic stresses and acute shocks they experience. (Source: *Resilient Cities Network*)

Public Financial Innovation: the updated infrastructure, policies, business models, and city-level ecosystems needed to enable enhanced government financial processes and serve communities through them.

Public Financial Technologies: technologies at the core of Public Financial Innovation, including digital payments solutions.

GLOSSARY_

Digital government is the use of digital technologies by public sector organizations to enhance access, efficiency, and quality of government services for residents and businesses.

Digital payments and financial solutions are technologies that can enable and streamline public processes including revenue collection (e.g., cities collecting taxes and fees), public disbursements (e.g., social support payments), public spending and procurement, and data insights and analysis (e.g., use of payments data for economic planning).

Government digitization is the process of converting government information and processes from analog to digital formats, enabling data and documents to be accessed, processed, and managed electronically.

Government digitalization is the comprehensive integration of digital technologies into all areas of government functioning, aiming to improve service delivery, enhance transparency, increase efficiency, and foster greater community engagement.

Payments data is information gathered when consumers use card payment and other remittance methods to complete transactions. When utilized on an aggregated and anonymized basis, data from payment transactions can provide granular information about economies and communities to support planning, policy development, and program delivery.

Public-purpose innovation is the ecosystem of new and updated technologies, public policies, organizations, cultures, and business models needed to address major public needs.

Urban digitalization is the process of applying digital technologies to governance, planning, and infrastructure investments in urban areas, aimed at enhancing resident wellbeing and addressing resilience challenges through more efficient, sustainable, and inclusive city services across various sectors such as security, healthcare, mobility, and community engagement.

EXECUTIVE SUMMARY:

CITIES THAT THRIVE_

Cities that thrive explores how urban centers can harness public financial innovation to help confront critical twenty-first century challenges, and prosper amid them.

The twenty-first century has proven to be full of uncharted territory for cities, from pandemics to increasingly widespread climate-change impacts and ongoing social, economic, and technological change. Resilient cities have the capacity to thrive in the face of such uncertainty and adversity. By building urban resilience, cities can help protect infrastructure and ecosystems, promote economic stability and social cohesion, safeguard public health and wellbeing, and help ensure the sustainability of their city for future generations. *Cities that Thrive* showcases how city governments can take steps to achieve rapid, context-driven progress across these critical areas by integrating Public Financial Technologies as a foundational layer within their resilience toolkit.

The aim of this report is both to map the current situation and to identify new trends in how cities engage public financial technologies. It further offers practical models for building up the urban public finance innovation ecosystem critical to meeting current challenges and preparing for future ones. Our data shows that cities across the globe have already started to engage public financial technologies, but may only just be starting to recognize the potential that these innovations can offer.

Why this matters now

1

Cities face significant financial and broader resource constraints in addressing their key resilience needs. Under such constraints innovation can be key to more effectively and efficiently serving local needs.

2

Cities are critically concerned about climate change, in every global region. Many opportunities exist for them to engage digital payments solutions, data-driven decision-making, and public purchasing innovation as vehicles to mitigate, adapt to, and respond to the impacts of climate change and extreme weather.

3

A broader range of city needs, including social equity and financial inclusion, are often underserved by current practices, and public financial innovation has a clear role to play in helping cities to address them.

4

There is a far greater level of data, insights, and decision-support tools on offer than cities are currently using. Payments and financial data and data analytics, for example, represent a promising opportunity for cities' planning and response strategies, enabling cities to support local communities and economies in a more tailored and effective way.

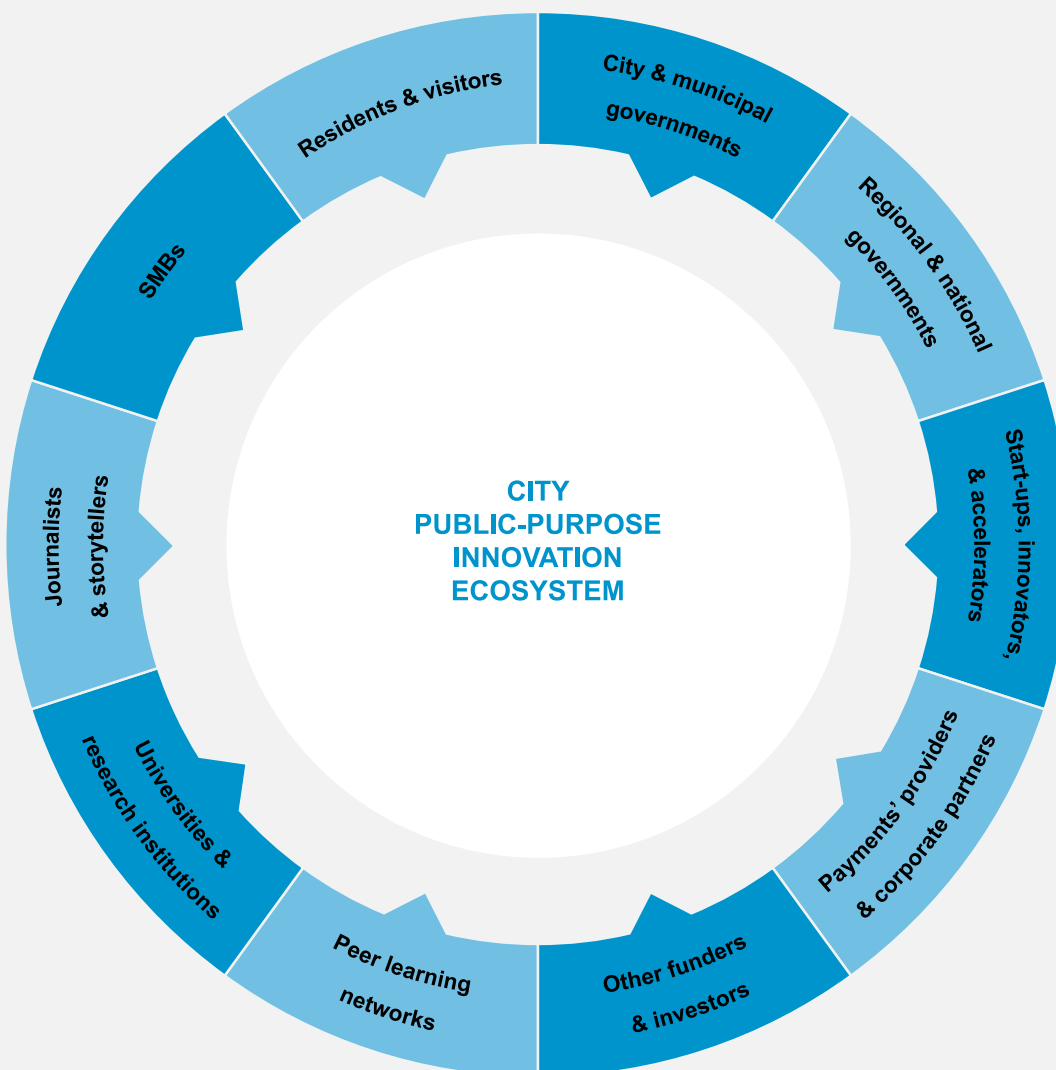
"I see a lot of potential benefits of my team's work and the data work we do for resilience. [...] The most success we've had is when we start working collaboratively [with resilience teams] from the basis of saying 'what problem do you want to solve?' and let's build something together."

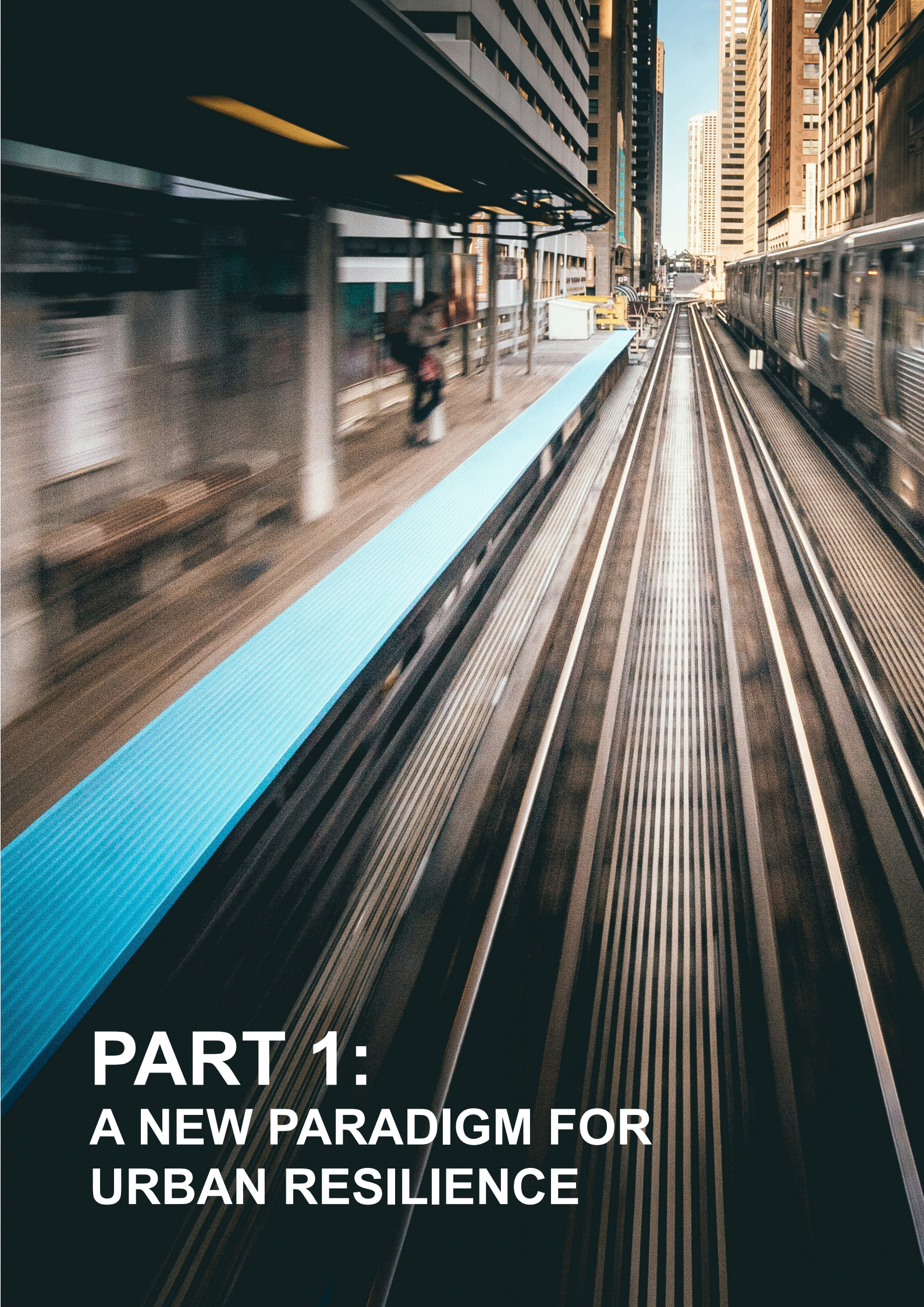
Theo Blackwell MBE, Chief Digital Officer, London

As our research shows, **the journey to integrating public financial technologies is not always simple**. Barriers, ranging from organizational silos to technical capacity gaps within government and among vulnerable populations, can slow or limit change. In our survey research, **most digital teams reported no mandate to work on policy challenges relating to social equity, economic opportunity, water security, food security, or resilience to natural hazards**. In addition, 33% of city resilience teams said they had no visibility or input into digital projects.

There is no “magic wand” solution: no two cities are exactly the same, and their approach to integrating public financial technologies must necessarily start from the needs and challenges faced by local communities. Success stories nonetheless reveal a common theme: action should be collective, involving, and led by, participants from across the public-purpose innovation ecosystem (see Figure 1), including city government, residents, and the private sector. **There are many lessons that can be learned from the experiences of other cities, and general principles that can help to galvanize the use of public financial technologies as a key lever for urban resilience.**

FIGURE 1: The city public-purpose innovation ecosystem





**PART 1:
A NEW PARADIGM FOR
URBAN RESILIENCE**

KEY MESSAGES



1

Cities worldwide face escalating resilience challenges driven by climate change, rapid urbanization, and digital transformation. The demand for innovative solutions to ensure urban systems can withstand, adapt to, and thrive amidst various stresses is urgent.

A key aspect of bolstering urban resilience lies in embracing digital tools and technologies.



2



3

Challenges such as uneven digital connectivity limit the effectiveness of digital interventions in many cities.

Public financial technologies can be pivotal tools in this landscape, offering avenues to address critical issues from accessibility and inclusion to government operational efficiency.



4



5

The use of these technologies towards resilience goals is not yet fully realized, and achieving them requires developing and involving a whole ecosystem of actors, including city government, residents, and the private sector.

WHY DOES URBAN RESILIENCE MATTER?

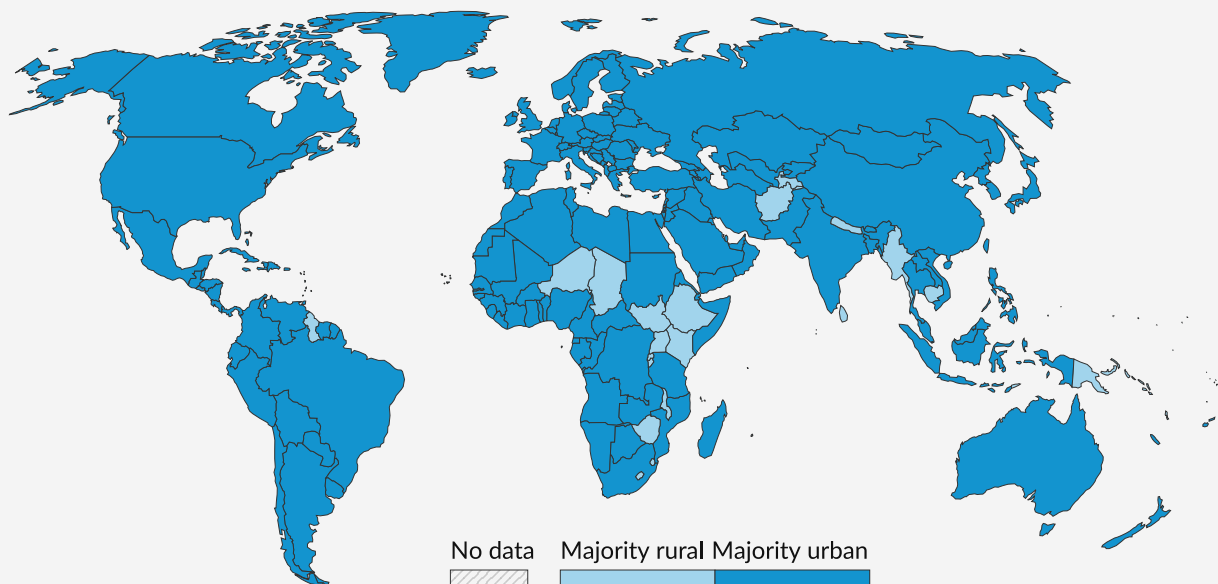
By 2050, the state of urban resilience will determine the well-being of the vast majority of our planet's inhabitants.¹

Cities, home to over half the world's population, face complex challenges in an era of rapid social, economic, environmental, and technological transformations.² 2023 was the warmest global year on record and stresses such as water scarcity among global urban populations are continuing to escalate.³ Furthermore, cities face continued financial crises, exacerbated by the Covid-19 pandemic, social unrest, and new global conflicts. These stresses are only set to deepen as urban populations grow. Current projections anticipate urban populations doubling over the next quarter-century.⁴ In almost every country of the world, more than 50% of the population will live in urban areas by 2050 (see [Figure 2](#)).

FIGURE 2: Map displaying projected global urban rural divide by 2050

DO MORE PEOPLE LIVE IN URBAN OR RURAL AREAS? 2050

'Majority urban' means that over 50% of the population resides in urban areas, whereas 'majority rural' means that at most 50% live in urban locations.



Data source: United Nations, Department of Economic and Social Affairs, Population Division (2018); HYDE (2023)

Note: Because the estimates of city and metropolitan areas are based on national definitions of what constitutes a city or metropolitan area, cross-country comparisons should be made with caution.

OurWorldInData.org/urbanization | CC BY

In this rapidly evolving context, it is increasingly critical for cities to be resilient: for their systems, businesses, institutions, communities, and individuals to have the capacity to survive, adapt, and thrive, no matter what chronic stresses and acute shocks they experience. This is more than a question of preventing or minimizing the loss of assets from specific shocks; urban resilience focuses also on *enhancing* a city's ability to perform under adverse conditions.⁵ By 2050, the state of urban resilience will determine the wellbeing of the vast majority of our planet's inhabitants.

¹ World Bank 2023. *Urban Development*. World Bank. <https://www.worldbank.org/en/topic/urbandevelopment/overview>

² Ibid.

³ Min, S 2024. 'Human influence can explain the widespread exceptional warmth in 2023'. *Communications Earth & Environment*, 5(1), p.215.; Savelli, E, Mazzoleni, M, Di Baldassarre, G, Cloke, H & Rusca, M, 2023. 'Urban water crises driven by elites' unsustainable consumption'. *Nature Sustainability*, 6(8), pp.929-940.

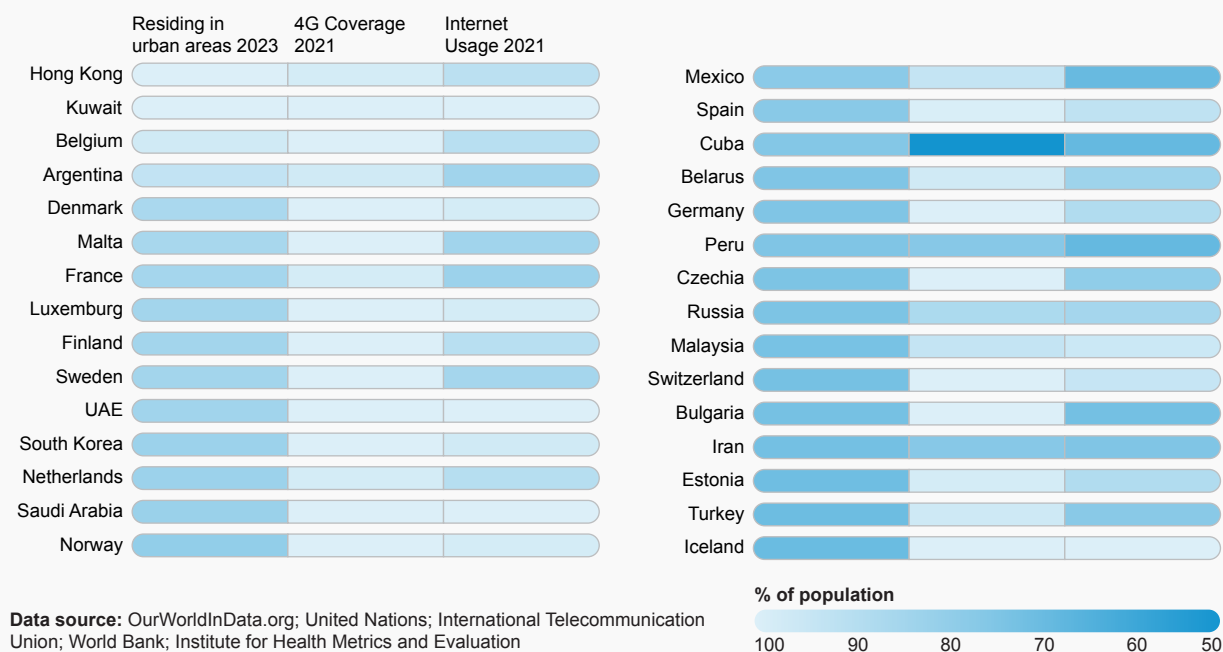
⁴ World Bank 2023. *Urban Development*. World Bank. <https://www.worldbank.org/en/topic/urbandevelopment/overview>

⁵ Arup & Resilient Cities Network 2023. *Digital Cities, Resilient Cities: Delivering urban resilience through digital solutions*. Arup & Resilient Cities Network. <https://resilientcitiesnetwork.org/digital-cities-resilient-cities/>

Of course, no two cities are exactly alike. Cities face a spectrum of resilience challenges, each shaped by their distinct environmental, social, and technological contexts. For example, while European cities typically enjoy high levels of digital connectivity and internet access, countries with highly urbanized populations in Latin America, including Mexico and Peru, face uneven connectivity levels (see Figure 3). Without reliable connectivity, devices, sensors, and infrastructure cannot perform their normal functions. This can lead to failures in critical systems like infrastructure monitoring, emergency response, and disaster management. When communities lack internet connectivity, they struggle to access essential digitalized services such as healthcare provisioning and social welfare payments.¹ This “network disadvantage” creates a barrier to sustainable technology adoption and its benefits for urban life.²

FIGURE 3: Digital connectivity in urban environments³

Regions with most urbanized populations have different levels of connectivity.



Fortunately, there is growing global awareness of the imperative for strong, creative, and contextually relevant forms of urban resilience. City-led initiatives such as the UN’s Making Cities Resilient campaign and organizations like the Resilient Cities Network aim to drive actions that support urban resilience, including protecting vulnerable communities from climate change and other physical, social, and economic urban adversities and challenges. In 2014, the Resilient Cities Network (then 100 Resilient Cities) and Arup developed the City Resilience Framework (see Figure 4), providing a comprehensive framework to understand urban resilience, encompassing the health and wellbeing of individuals, urban systems and society, economy and society, and leadership and strategy. This understanding has only further flourished in recent years, and many cities are now proactively working to assess vulnerabilities and implement resilience strategies, often through the appointment of a Chief Resilience Officer (CRO).

CROs typically have a mandate to coordinate across government departments and city stakeholders to “craft strategies and implement actions that build citywide resilience”.⁴ They are increasingly accompanied by a skilled and resourced team around them.⁵

¹ Ibid.

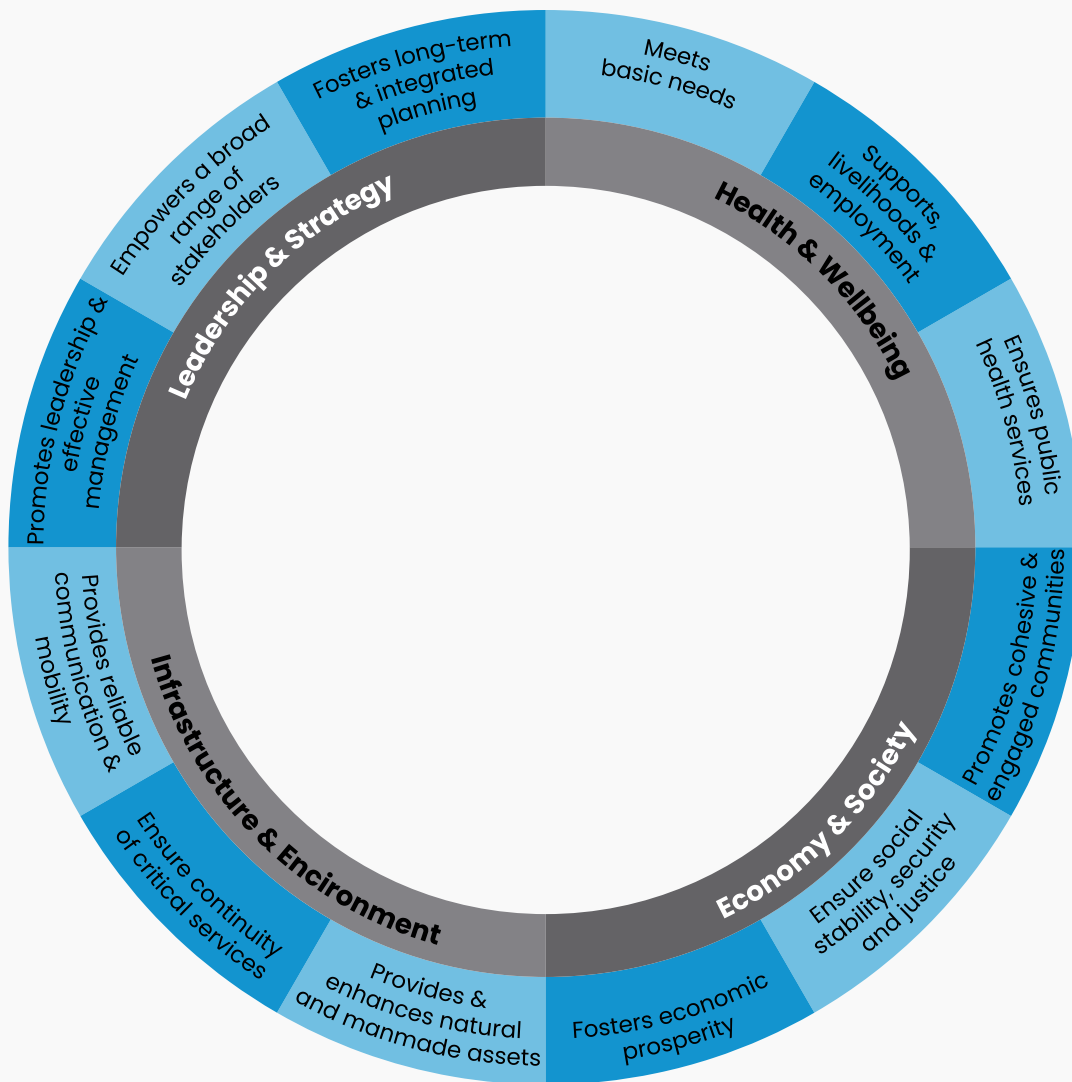
² Valenzuela-Levi, N 2021. ‘The written and unwritten rules of internet exclusion: inequality, institutions and network disadvantage in cities of the Global South’, *Information, Communication & Society*, 24(11), pp. 1568–1585.

³ UN & HYDE 2023. *Share of population residing in urban areas*. United Nations, Department of Economic and Social Affairs, Population Division. *World Urbanization Prospects Dataset*. PBL Netherlands Environmental Assessment Agency. *History Database of the Global Environment 3.3*. Our World in Data. www.ourworldindata.org/grapher/urban-population-share-2050; UN & Our World in Data 2024. 9.c.1 - *Proportion of population covered by at least a 4G mobile network (%) - IT_MOB_4GNTWK*. Our World in Data. www.ourworldindata.org/technological-change; Ritchie, H, Mathieu, E, Roser, M & Ortiz-Ospina, E 2023. *Internet*. Our World in Data. www.ourworldindata.org/internet

⁴ Morales-Burnett, J & Marx, R 2022. *The Rise of the Chief Resilience Officer*. Urban Institute. <https://www.urban.org/research/publication/rise-chief-resilience-officer>

⁵ Cities are also drawing from the CRO office and experience by developing roles designed to tackle specific shocks or stressors that are particularly impacting their communities. For example, cities and counties, including Athens and Miami-Dade County, Florida, have created the role of Chief Heat Officer with specific responsibilities for combatting the growing urban challenge of extreme heat.

FIGURE 4: The City Resilience Framework, developed as a ‘common reference point’ for understanding city resilience



WHICH SYSTEMIC RESILIENCE CHALLENGES MOST CONCERN CITY OFFICIALS?

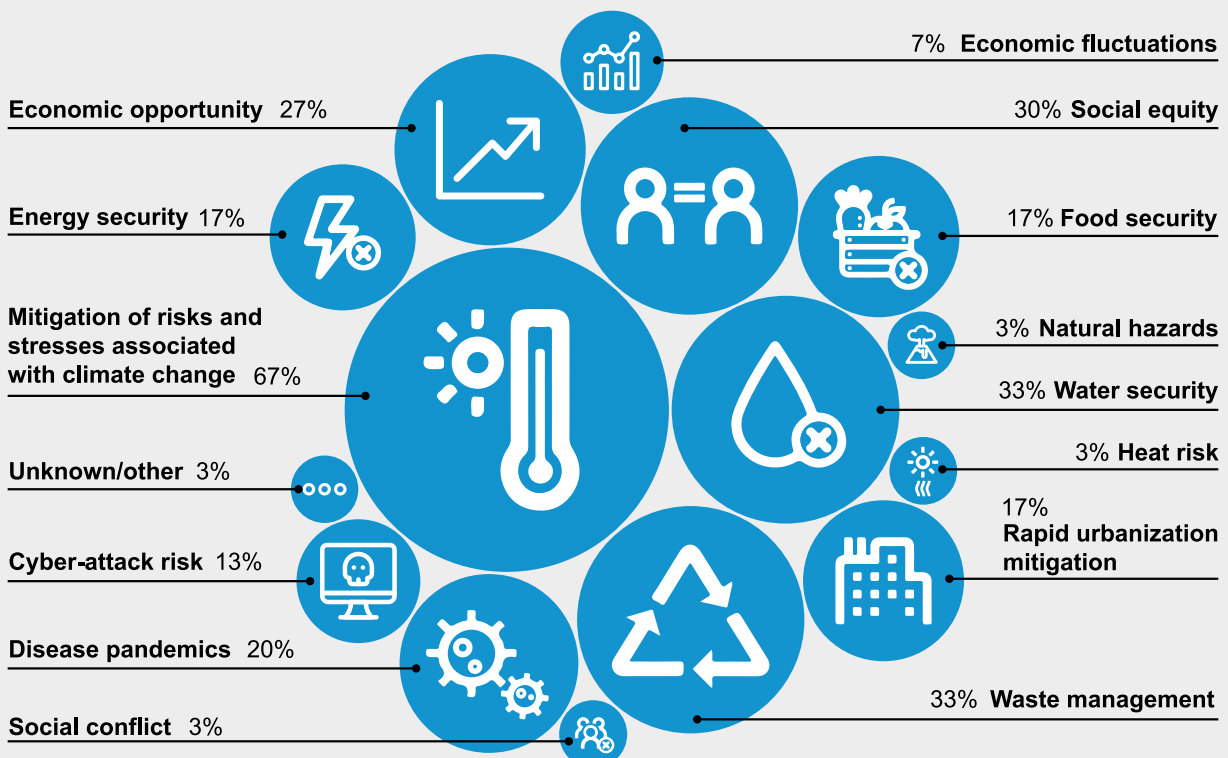
There are several significant shared global systems-level resilience challenges that are both fundamental to a city’s wellbeing, and that increasingly preoccupy city governments around the world. As part of our survey of city officials, city officials were asked about their resilience priorities over the past three years. For almost 70% of cities across every global region, mitigation of the risks and stresses related to climate change has been a top priority (see Figure 5). This finding is supported by Resilient Cities Network’s Chief Resilience Officer Survey (2024), where climate change was identified by 69% of respondents as the top stress in 2023.¹

¹ Resilient Cities Network 2024. *R-Cities CRO Survey*. https://resilientcitiesnetwork.org/downloadable_resources/Other/2023%20RCities%20Chief%20Resilience%20Officer%20Survey%20Results.pdf

Key priorities across all cities, ranked by frequency of being identified within “top three priorities” over the past three years by CROs and other city officials, include:

-  **Addressing climate-change impacts**, including adapting to and mitigating the risks and stresses associated with heat, extreme weather events, and flooding.
-  **Tackling waste management**, including waste collection, management and disposal, e-waste, city hygiene, and plastics recycling.
-  **Improving water security**, including supply, storage, treatment and assessment, off-grid solutions, and emergency transfers.
-  **Ensuring social equity**, including increasing accessibility of services and economic opportunities for vulnerable communities.
-  **Boosting economic opportunity**, including tackling challenges related to local industry, development of local Small and Medium Businesses (SMBs), and employment.
-  **Managing pandemics and recovery**, including through contactless solutions, post-pandemic recovery, and evidence-informed decision-making.

FIGURE 5: Cities’ self-reported top resilience priorities over the past three years (percentage of city officials’ responses)



WHY ARE PUBLIC FINANCIAL TECHNOLOGIES AN IMPORTANT RESOURCE FOR IMPROVING URBAN RESILIENCE?

Enhancing the impact of public financial technologies means opening a path to informed, accountable, and effective decisions that earn the trust of communities.

The resilience challenges that city governments face point to the very nature of cities. Cities are complex “systems of systems” made up of interconnected social, economic, environmental, and physical components.¹

As a result, urban resilience strategies must catalyze systems-level change both to tackle exogenous stresses and shocks and to enable people to thrive in the long-run in cities and in the areas of urban agglomeration around them. Such positive outcomes depend in large part on the services that interconnected urban systems provide, from transport to food provision and from healthcare to education.

Today, these systems are more interdependent than before. For example, the growing popularity of electric cars and the integration of digital technology into roads and rail mean that transport infrastructure needs to be closely coordinated with the power grid. Much of our energy generation relies on water resources, for cooling and hydropower. As a result, these systems - and the branches of government responsible for each of them - must be brought much more closely into alignment with each other. Effective service delivery requires coordinating the city as a whole, not just as individual parts.

Coupled with this critical need for integrated service planning, uncertainty around future financing and revenue generation is also a major concern across cities of every size. Systems both serve people, and depend upon them. Understanding how residents are engaging with every service, what they think and feel about them, and where they are choosing to spend money (or not) is therefore critical for effective planning and policymaking. These are not the concerns of resilience teams alone; they strike at the core of city governance today.

To navigate these compounding complexities, many of local government’s traditional paradigms and hierarchies are no longer fit for purpose. To better serve the evolving demands of cities and populations, we need an approach that brings together and decodes diverse and trusted data, information flows, disciplines, and people. City governments must get to the other side of the learning curve to build forward in an effective and inclusive way.

Public financial technologies have a key role to play in these critical efforts towards service coordination and community understanding. Public financial technologies can power payments to people and businesses across whole systems, and generate cross-service and comparative insights through data analysis. They can enable consumer choice, letting residents decide what works best for them; and can facilitate competition for government contracts through allowing vendors to operate on top of shared digital financial infrastructure.

Despite this possibility, current approaches to digital technologies in general, and payments solutions in particular, often focus on digitizing existing processes — putting paper processes online— rather than taking this more transformative approach.² Unlike simple “digitization”, *resilience-focused digitalization* reforms a whole process or system not only to improve efficiency gains but to meet core local needs such as improved health and wellbeing and climate-change preparedness.

Enhancing the impact of public financial technologies means opening a path to informed, accountable, and effective decisions that earn the trust of communities. Public financial technologies must be engaged not as an end in itself, but as a foundational layer to build adaptive governments and cities that serve people’s evolving needs for generations to come.

¹ Debnath, R, Pettit, C & Leao, S, 2022. ‘Geodesign approaches to city resilience planning: a systematic review’. *Sustainability*, 14(2), p.938; Godschalk, D.R., 2003. Urban hazard mitigation: Creating resilient cities. *Natural hazards review*, 4(3), pp.136-143.

² Irani, Z Abril, R, Weerakkody, V, Omar, A & Sivarajah, U 2023. ‘The impact of legacy systems on digital transformation in European public administration: Lesson learned from a multi case analysis’. *Government Information Quarterly*, 40(1), p.101784.

HOW CAN CITIES ENABLE PUBLIC FINANCIAL INNOVATION?

Public financial innovation requires developing and involving a whole ecosystem of actors (see Figure 1), including city government, residents, and the private sector. In government, it requires multidisciplinary teams aligned on desired outcomes and working together to meet them.

The process is further supported by core underlying digital infrastructure, sometimes referred to as Digital Public Infrastructure (DPI), as an “enabler” on top of which the ecosystem can innovate.

Digital Public Infrastructure (DPI) as an ecosystem enabler

Digital Public Infrastructure (DPI) refers to shared, secure, and interoperable digital systems, aimed at achieving equitable access to public and/or private services, and accompanied by supportive legal frameworks.¹ DPI is often understood to include three specific layers of ‘infrastructure’ in digital systems: digital payments, data exchange, and digital identification (see Figure 6). In practice, there is a lot of variation in how countries approach DPI and which specific features it includes.

DPI is rising to prominence globally, but has been gaining particular momentum and investment through global development forums for Low and Middle Income Countries (LMICs) to push forward inclusive economic growth and financial access. Cities’ investments in digital financial technologies sit within, and can benefit from, these wider technological and legal/regulatory contexts at national and regional levels.

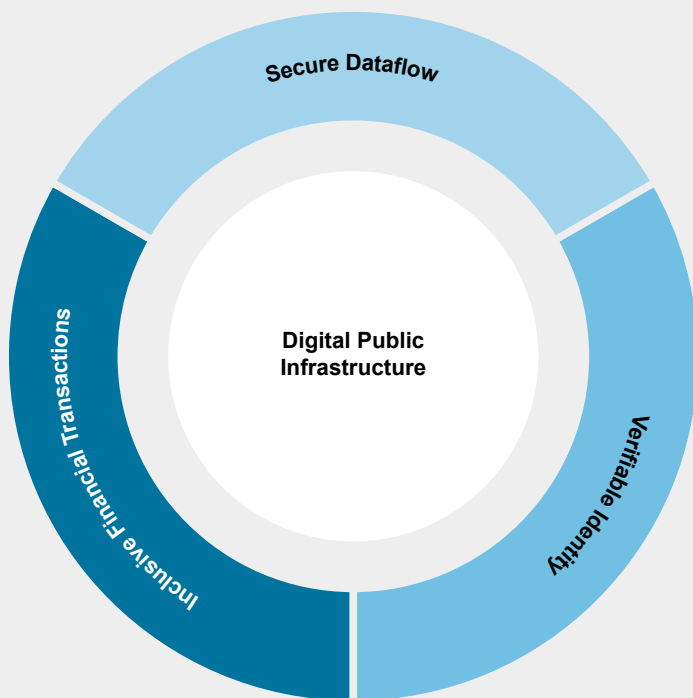
DPI can provide core technological and governance layers that underpin digital financial innovation by cities. Herein lies both a key challenge and opportunity for cities. A challenge given the wider infrastructural investments required for their own digital journeys, and an opportunity to learn from and adopt principles and approaches to digital transformation taken at national, sectoral, and regional levels. To make the most of these developments, cities must take account of the fact that:

1. **THEIR EFFORTS SIT WITHIN NATIONAL AND WIDER DIGITAL TRANSFORMATIONS AND INVESTMENTS:** DPI requires **physical, hardware, software, and governance layers** involved in digital transformation. National/contextual infrastructural investments are important foundations for cities to build upon, to unlock public and private sector activity and innovation.
2. **PRINCIPLES DRAWN FROM NATIONAL AND REGIONAL DPI INITIATIVES FOR DIGITAL TRANSFORMATION COULD HELP UNLOCK DIVERSE OPPORTUNITIES FOR USE:** DPI discussions focus on enabling widespread, diverse, and accessible uses of digital payments, digital verifiable identity, and data exchange infrastructure. How might cities learn from a ‘DPI approach’ to digital financial technologies (including considerations of data security and privacy) to facilitate more inclusive and diverse outcomes at the city-level? For example, how can they ensure that city investments in public financial technologies are secure, interoperable, and accompanied by appropriate governance frameworks?

Importantly, viewing city-level digital transformation through the lens of DPI provides an expanded view of the technologies, stakeholders, relationships, costs, and investments implicated in cities’ uptake of digital financial technologies. It also points to the likely need to assess cities’ challenges and opportunities regarding digital development within national and regional approaches (e.g., limits and/or opportunities posed by national digital ID systems, or national regulation of payments systems).

¹ UNDP 2023. *Accelerating The SDGs Through Digital Public Infrastructure: A Compendium of The Potential of Digital Public Infrastructure*. www.undp.org/publications/accelerating-sdgs-through-digital-public-infrastructure-compendium-potential-digital-public-infrastructure

FIGURE 6: The components of Digital Public Infrastructure



Cities must recognize that DPI and any public financial technologies developed on top of it **must be designed to achieve inclusive outcomes - this quality will not emerge by default**. In developing strategies for integration of public financial technologies, cities should be acutely aware of the inequalities that surround digital access, beyond internet provision alone. In many countries, women are less likely than men to own a mobile phone or have basic digital literacy.¹ In low-income countries, a gender gap of roughly 17% exists in mobile phone ownership; many women also do not have access to the formal financial system.² Women are also less likely to run a business, or be household decision-makers, making them less well-placed to contribute to or determine their own economic resilience. Cultural factors mean that these patterns are more pronounced in some regions than others, but they nonetheless broadly hold across continents.³

As cities consider their strategies for reliable digital connectivity including affordable mobile internet, and as they form partnerships with telecommunications providers, these factors must be given due consideration. Cities should strive both to assess gender and other demographic inequalities, and use these findings to inform how to design, or co-design, approaches to leveling the playing field. As we discuss in Part 2, public purchasing can be one vehicle for supporting Women- or Minority-owned Business Enterprises (WMBEs). Targeted digital and financial literacy programs and financing also have a role to play. City governments can also ensure that women-run businesses have the skills and products needed for entry into the digital economy to reap the benefits of broader marketplace entry and to better serve local customers, as discussed in Part 2.⁴

1 GSMA 2023. *The Mobile Gender Gap Report 2023*. <https://www.gsma.com/r/wp-content/uploads/2023/07/The-Mobile-Gender-Gap-Report-2023.pdf>

2 Ibid.

3 Ibid.

4 Africa leads globally in terms of the number of women-owned businesses, with women comprising 58% of the continent's self-employed population (Dushime 2022).

THE EMERGING OPPORTUNITY TO ADDRESS URBAN RESILIENCE GOALS

Though cities are taking proactive steps to adopt public financial technologies, they are only at the beginning of uncovering the potential opportunity that lies ahead to engage them to enhance urban resilience.

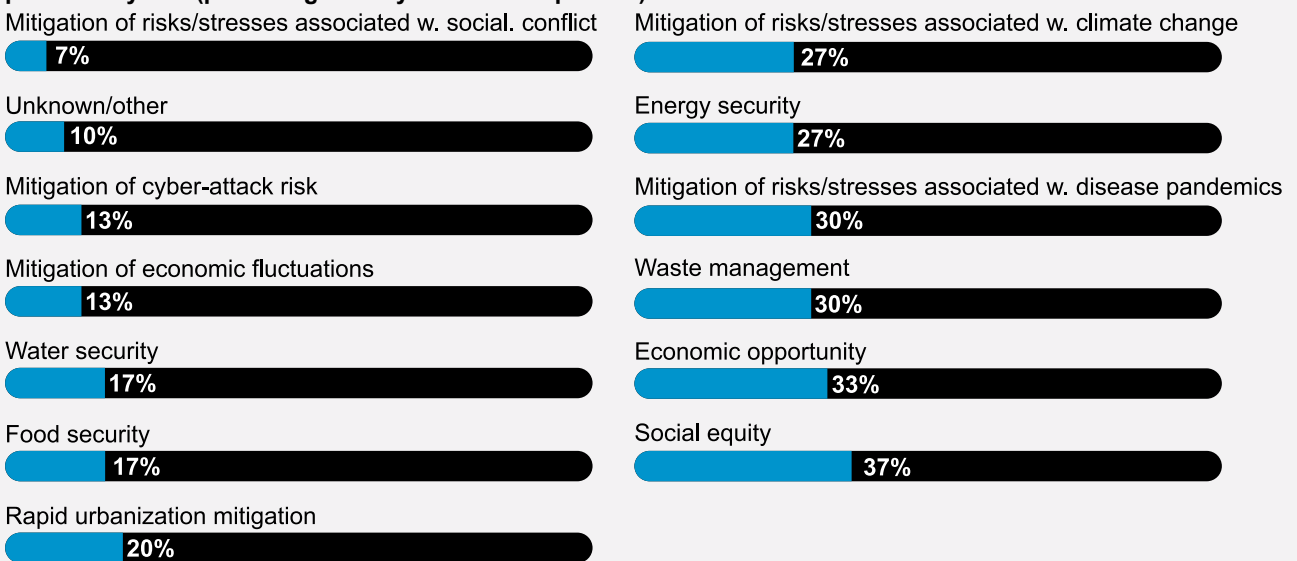
Engaging digital technologies to make cities better, safer, more sustainable places to live and work is far from a ‘top-down’ mandate or process. Amid rapid technological change and deepening inequality, small businesses increasingly recognize their own needs for both digital training and tools, to boost their productivity and long-term future.¹ Prominent civil society organizations are also requesting that governments adopt an inclusive approach to digital financial services. For example, in 2021, the Financial Inclusion Commission (UK) asked the UK Government to ensure that it “considers the future digital infrastructure needed for an increasingly digitally dependent society.”² These calls for participation occur against a backdrop of budgetary constraint in many cities and countries, creating an additional and strong efficiency imperative.

Despite this interest, today, public financial technologies’ solutions are used only sporadically to achieve urban resilience goals. Across 30 cities that identified resilience goals for which they have employed public financial technologies in the past three years, there is no single resilience goal for which all cities have tested an approach that engages public financial technologies (see Figure. 7). Cities rarely use insights from payments data to predict and plan for food shortages and ensure food security. Similarly, few cities have engaged payments data to tackle risks of economic fluctuation. Fewer than half the respondents have used public financial technologies solutions to tackle the adverse effects of climate-change impacts - for example to disburse emergency payments to residents during floods or following an earthquake, where residents may need quick access to funds and may not be able to travel to physically pick up payments. Early evidence from cities suggests that these uses could provide a step-change in the urban resilience infrastructure that city governments offer to, and co-create with, their communities.

“[Digital payment solutions allowed us to] keep business thriving in a contactless environment, leading to swifter post-pandemic recovery of communities and businesses.”

City Official, Wellington, New Zealand

FIGURE 7: Resilience focus areas for which cities have used public financial technologies over the past three years (percentage of city officials’ responses)



¹ Czibor, E 2020. *Act Fast and Do Whatever It Takes*. Nesta. www.nesta.org.uk/blog/act-fast-and-do-whatever-it-takes/

² Financial Inclusion Commission 2021. *HM Treasury Access to Cash Consultation, 23 September 2021*. FIC. <https://financialinclusioncommission.org.uk/wp-content/uploads/2021/09/FIC-HMT-Access-to-Cash-response.pdf>

A photograph of a city skyline at dusk. The sky is a deep blue. In the foreground, a tall, modern building with a grid-like facade is visible on the left. In the center, the Space Needle is illuminated. To its left, a construction crane is visible. Other buildings with lit windows are scattered across the skyline.

**PART 2:
ACTIONS FOR CHANGE:
CITIES LEADING PUBLIC
FINANCIAL INNOVATION FOR
URBAN RESILIENCE**

KEY MESSAGES

1



Cities are starting to integrate public financial technologies into their resilience approach, but there are many opportunities that have not yet been realized.

We identify five main categories of public financial technologies that can be powerfully engaged to help meet pressing resilience challenges.

3



The widespread use of digital tax and fee collection serves as a well-established model for the adoption of new technology by governments and residents. Tax collection platforms and technologies can serve as frameworks to unlock access to more city services and contribute to reaching cities' resilience goals.

2



4



Digital payments to residents and businesses can play a substantive role in addressing cities' goals to increase access and inclusion, especially in crisis situations.



Digital public purchasing can contribute to local economic development and cities' ability to foster inclusive innovation that addresses local resilience challenges through simplifying the government marketplace for a diverse range of vendors.



Cities can gain insights for resilience planning and response strategies from payments and financial data analytics. Cities have already started to use aggregated, anonymized purchasing data to derive insights into priority economic sectors, predict crises, and inform public health responses - all critical components of urban resilience.

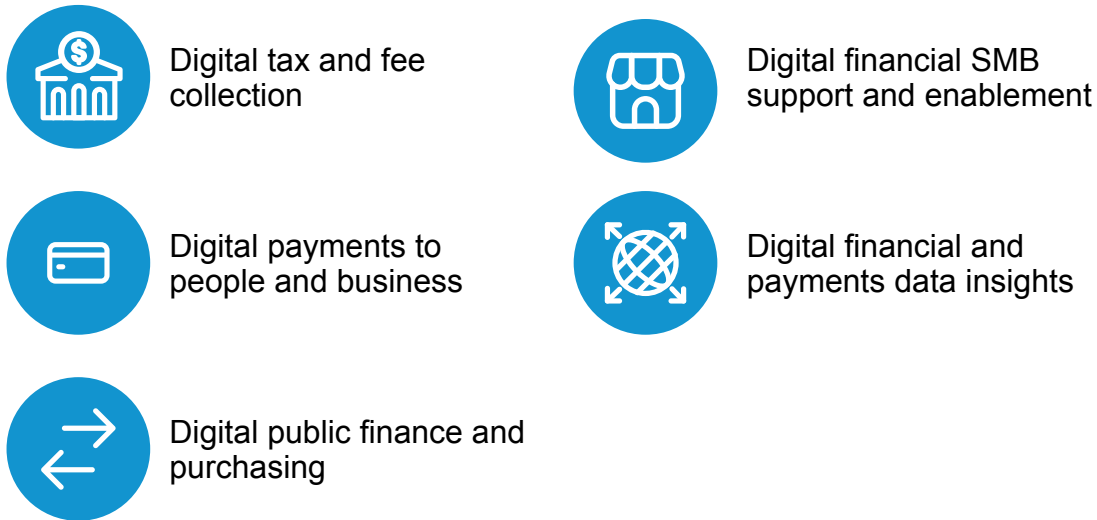


City governments can also support economic opportunity and participation by empowering SMBs with digital payments' acceptance solutions.

Part 2 examines the evolving landscape of public financial technologies within cities. It starts by considering how cities with resilience strategies that prioritize digital technologies are often best placed to meaningfully catalyze the processes that can unlock public financial innovation for urban resilience. It then pinpoints five categories of public financial technologies that can help to drive the systems-level changes needed to meet the key resilience challenges identified by cities in Part I.

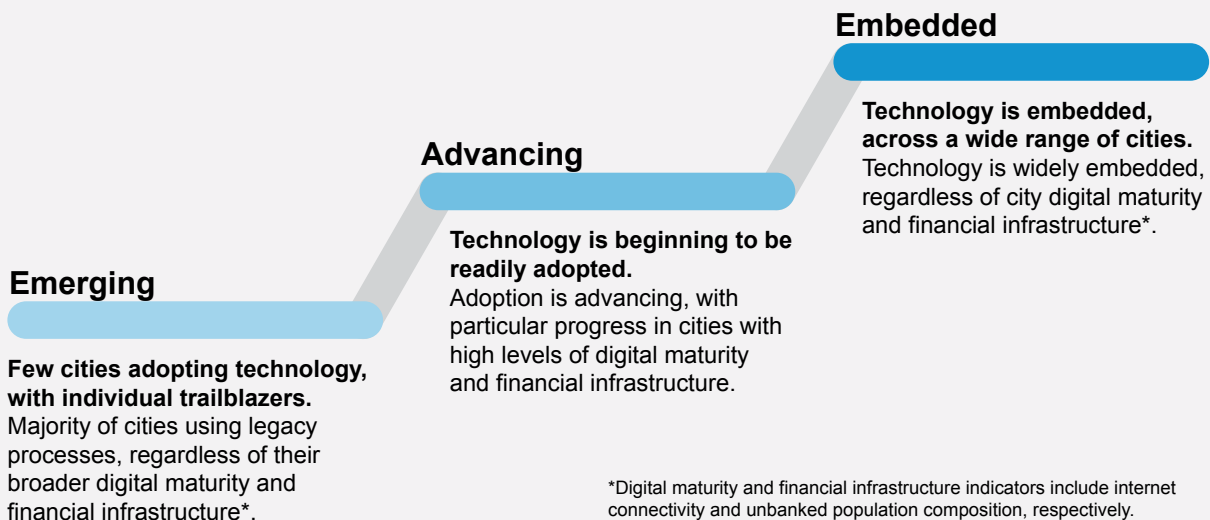
These technologies are at different levels of adoption within cities (see Figure. 8), with only one, digital tax and fee collection, consistently adopted throughout cities of different sizes and levels of digital maturity. The experience of tax digitalization to date shows how public financial innovation is already strengthening city-level social, financial, and climate resilience, and provides a platform for further development.

The public financial technologies explored here include:



For each, we provide examples of the improved resilience that they have already helped to achieve in cities around the world. While each city’s journey towards incorporating public financial technologies into their resilience strategy and delivery is unique, the challenges they face and successes that they have already worked to achieve offer valuable lessons for other cities around the world.

FIGURE 8: How embedded are public financial technologies in cities?

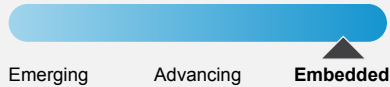


How embedded are public financial technologies within cities?

Digital tax and fee collection

Streamlining government payment acceptance, including simplifying tax and fee payments, integrating digital payment options into government service apps to facilitate smoother and more accessible transactions, and ensuring financial continuity and resilience for city governments during crises.

Status



Emerging Advancing **Embedded**

Digital payments to people and business

Facilitating payment disbursements, improving accessibility, inclusivity, and speed in delivering financial aid such as social support, stimulus payments, and disaster relief, ensuring swift and effective response to emergencies.

Status



Emerging **Advancing** Embedded

Digital public finance and purchasing

Promoting participation through digital commercial payments and government purchasing processes, supporting diverse and resilient local economies and SMB inclusion in government spending processes through streamlined commercial payment methods.

Status



Emerging **Advancing** Embedded

Digital financial SMB support and enablement

Empowering SMBs with support for digital payment acceptance solutions, facilitating inclusion in local economy participation in government payments, and enabling SMB loans and credit lines to strengthen cities economic and innovation ecosystems.

Status

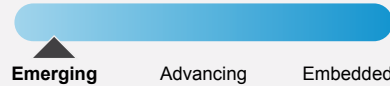


Emerging **Advancing** Embedded

Digital financial and payments data insights

Leveraging data insights for enhanced planning, policy and service delivery, utilizing aggregated and anonymized payments data to inform urban planning initiatives, economic development, sustainability efforts, and resource allocation.

Status



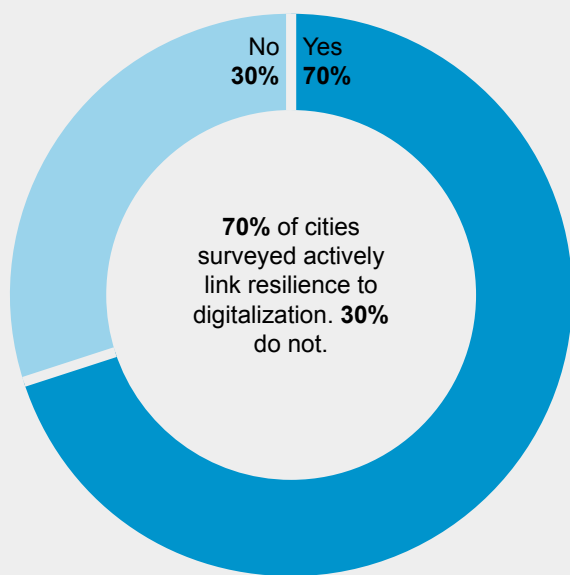
Emerging Advancing Embedded

Our public financial technologies pulse check (see Figure 8) defines how embedded a technology is within city governments. “Emerging” public financial technologies indicate a technology that few cities are currently adopting. “Advancing” technologies are being used with increasing frequency, particularly in cities with more mature digital infrastructure. “Embedded” technologies indicate public financial technologies that are in wide use across a broad range of cities. Statuses have been determined through city self-reporting in survey research and interviews, supported by analysis of municipal and country websites and documents between January and April 2024.

A NECESSARY FIRST STEP: INTEGRATING PUBLIC FINANCIAL TECHNOLOGIES INTO CITY RESILIENCE STRATEGIES

Some of the world's largest cities are prioritizing resilience planning.¹ Developing a clear resilience strategy is crucial because it equips a city with a flexible blueprint from which to handle unexpected disasters and to improve its adaptive capabilities. Resilient Cities Network member cities are increasingly developing comprehensive resilience strategies.²

FIGURE 9: City officials' responses to whether they actively link resilience to digitalization



70% of cities that we surveyed said that they actively link resilience to digitalization. Within this cohort, cities are increasingly prioritizing public financial innovation in their resilience strategies, recognizing its foundational value to improving outcomes for local people. They are also reflecting on how a strong digital economy, supported by city-level financial innovations, is critical to the social and financial resilience of their cities.

“DESIRED OUTCOME: A greater number of Capetonians capable of participating in the digital economy as entrepreneurs, workers and customers, and able to adapt to rapid change when it occurs, in order to build economic resilience.”

Cape Town Resilience Strategy, 2019

As part of these strategies, cities are also increasingly acknowledging the crucial role that data and digital technologies will play in their city's resilience ([see Figure 10 for examples](#)), and the livelihoods of their communities and businesses.

¹ Debnath, R, Pettit, C & Leao, S, 2022. 'Geodesign approaches to city resilience planning: a systematic review'. *Sustainability*, 14(2), p.938.

² Resilient Cities Network 2022. *Co-creating a Resilient Future 2020-2021*. https://resilientcitiesnetwork.org/downloadable_resources/UR/SP/2022/Co-creating-a-resilient-future-2020-2021.pdf; Croese, S, Green, C & Morgan, G, 2020. 'Localizing the sustainable development goals through the lens of urban resilience: Lessons and learnings from 100 resilient cities and cape town'. *Sustainability*, 12(2), p.550.

FIGURE 10: Example of data and digital focuses in city resilience strategies



“An electronic management system that allows users to upload necessary documents and pay fees online will help reduce human error in data conversion. [...] This data can also be fed into the “urban data observatory” that aims to support data driven decision-making in the water sector.” - [Chennai, India](#)

“A wide-reaching intervention in improving digital literacy will contribute to reducing inequality between Capetonians, and will ensure that a greater number of people are not left behind in these times of rapid technological change. It will also contribute to more people being able to participate in the digital economy as consumers and digital citizens with an increased ability to access training, knowledge, and services.” - [Cape Town, South Africa](#)



“Improving the knowledge base on disaster risks by enhancing cooperation on data accessibility and comparability;” - [Tbilisi, Georgia](#)

“Digital tools can help solve some of the City’s most urgent resiliency challenges, bolster neighborhood resiliency and social cohesion, and improve our ability to withstand disruptive events.” - [New York City, USA](#)



“Data-sharing between public agencies and utilities should be focused on maximizing public value while minimizing potential harmful impact. As part of the Smarter London Together Roadmap, the Chief Digital Officer is developing an approach which emphasizes common standards and support for responsible data-sharing” - [London, UK](#)

“To encourage funding and pool the talents of the best minds of private enterprises that own big-data, a Public-Private model will be formed, led by financial, distribution, and communication companies, academia, and public institutions to implement an innovative framework for data-analysis to improve quality of Seoulites’ lives.” - [Seoul, South Korea](#)



City resilience strategies are valuably acknowledging, and in some cases also beginning to develop, goals, outcomes, and measures around the power and potential of digitalization for their city’s resilience. This places resilience and adjacent municipal teams at the forefront of bringing together innovative digital solutions with urban resilience planning. Resilience strategies are one place where this cooperation happens first, serving to provide legitimacy and buy-in for digital-first, or digital-inclusive, approaches to urban resilience that truly meet their city’s needs.



CITY STORIES _

Broward County brings digital into its urban resilience planning and strategy

Broward County, Florida's second-largest and seventh most diverse county, has adopted innovative digital tools to help plan for, and respond to, escalating threats from sea level rise, intense storm surges, and extreme heat. Approaches include data-driven economic modeling, sea level rise scenario modeling, and spatial analysis of vulnerable populations relative to climate risk. Digital tools have also been used to update the public, and encourage engagement, on the county's resilience planning efforts.

The approach has benefited from the municipality's close consultation with the community and across government, ensuring collective buy-in. A resilience Steering Committee, consisting of local stakeholders, community representatives, and subject matter experts, has also been established to oversee planning, convening quarterly to review updates and guide the process.

Key initiatives that have already engaged public financial innovation and broader digital and data tools to deliver strengthened resilience include:

Municipal rental assistance

To streamline municipal payments processes, the Human Services Division employs a web-based management system to process county rental assistance applications. This integration ensures robust data management and enhances the efficiency and effectiveness of large-scale fund disbursements for rental housing assistance. The success of this approach has led to its replication in other local regions: "This data management system significantly supports a large disbursement of funds for rental housing assistance within Broward County", a city official shared.

Digital permitting transition

Historically, Broward County has managed a complex permitting process that required residents and applicants to visit multiple offices to obtain necessary permits for projects, including construction permits and for environmental review. "Back in the day, we would have customers [...] go to different buildings and get different permits from all the different agencies," an official noted. Recognizing the inefficiencies, the county centralized its permitting services into a one-stop e-permitting system.

A significant initial challenge in implementing this system was an existing legal limitation on the use of digital signatures: "We needed to have legislation that would allow an engineer to sign and seal documents with an electronic signature," explained a county official. After successfully achieving this required legislative change, the county was able to implement a fully digital permitting system that could serve all departments.

Implementing a one-stop permitting system has increased accessibility to services, including for vulnerable communities. The initiative has also demonstrated the opportunities for digitalization to bring together fragmented government services into a single location. "Everything comes in electronically, and it's so much more efficient," an official described.

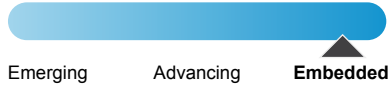
Geographic Information Software (GIS), digital tools and capabilities for an enhanced resilience strategy

Broward County has established the Resilience Roadmap application which was designed to catalog and display major resilience-related projects, making detailed information about these initiatives easily accessible.¹ "We wanted to generate an app that provided all the highlights [...] of where you can find [...] these real resilience investments so the public can [understand, and see, what is going on]," a county official explained. The digital tool allows users on the ground to locate and learn about various projects, such as solar energy installations and flood mitigation efforts.

¹ Broward County 2024. *Resilience Roadmap*. <https://experience.arcgis.com/experience/0213ff7d2820452aa29cd6d223f1b01b>

DIGITAL TAX AND FEE COLLECTION: A SPRINGBOARD FOR FURTHER INNOVATION

Status



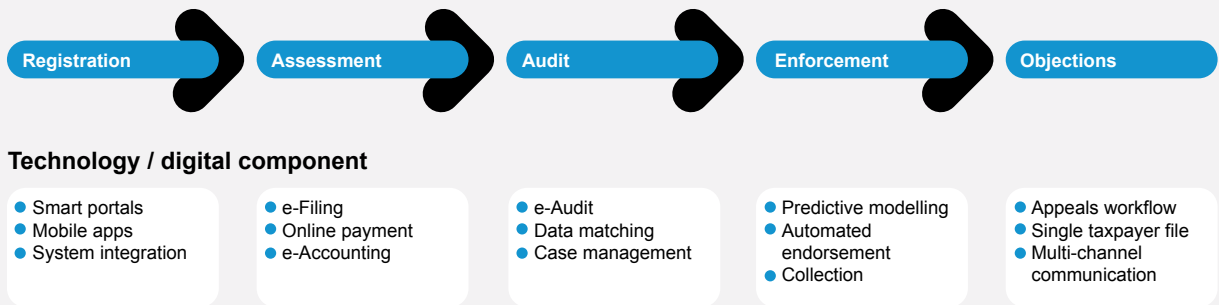
Resilience outcomes explored here



Digital tax and fee collection is a governments' capacity to receive and process digital payments from the community. Platforms and solutions developed by governments to facilitate tax and fee collection can also be used to grant access to other government services and facilitate other transactions.

FIGURE 11: Technology that enables the tax administration cycle¹

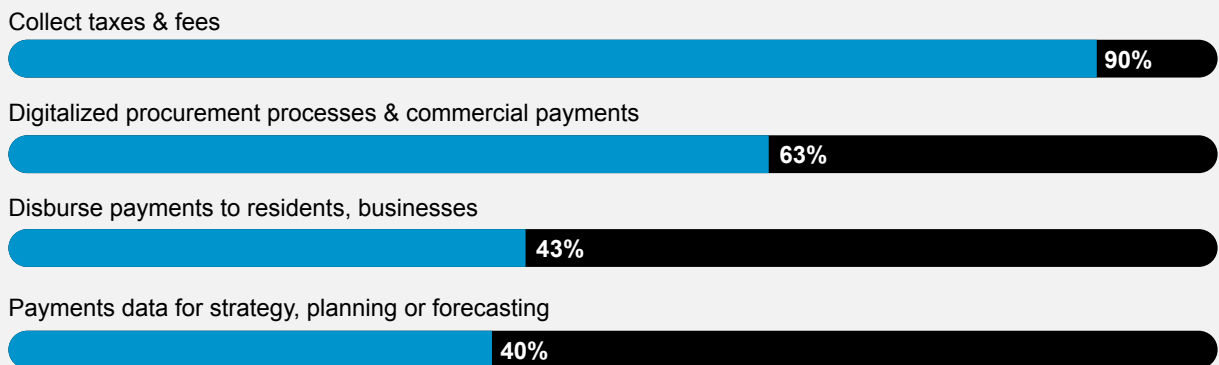
End-to-end tax administration cycle



Digital taxation and payment acceptance systems are now firmly embedded across cities. They serve as a model for integrating public financial technologies into city government frameworks, and can serve as springboards for deployment of other public financial technologies. Over 90% of cities surveyed have digitalized their tax and fee collection process (see Figure 12), and it is now standard practice in many cities around the world. For some cities, particularly in the US, this digital process is decades-old. For others, Covid-19 triggered the uptake of a digital approach, to counter the need for in-person or postal tax payments. An increasing number of cities are also starting to integrate additional services through platforms used for digital tax and payments' acceptance.

¹ Adapted from: Asian Development Bank 2022. *Launching a Digital Tax Administration Transformation*. <http://dx.doi.org/10.22617/TCS210343>; OECD 2020. *Tax Administration 3.0: The Digital Transformation of Tax Administration*. OECD. www.oecd.org/tax/forum-on-tax-administration/publications-and-products/tax-administration-3-0-the-digital-transformation-of-tax-administration.htm

FIGURE 12: How cities are engaging digital payments' solutions



City leaders note in our survey and interview research the significant direct benefits they have seen from digitalizing the tax collection process, including speed and quantity of revenue collection. In Surat, India, for example, the city has reportedly been able to achieve a 100% tax collection rate through digitalization. Cities are also quick to identify broader positive outcomes that have emerged from tax digitalization. For example, in 2020, Penang, Malaysia utilized its fully digital taxation and fee payment system to enable merchants to remotely pay stall rentals, tax assessments, and parking fees, enhancing accessibility, bolstering economic resilience, and supporting local health measures.

Porto Alegre, Brazil, digitalized its tax processes at the start of the Covid-19 pandemic. Bruno Beltrame, Porto Alegre's Head of Resilience notes that the outcomes extend beyond a boost to city revenues: "we've been able to reinvest that money in other key needs, including health and education." Cities are particularly mindful that the efficiencies unlocked through digital tax collection help to ensure the financial resilience of their cities during times of fiscal constraint.

"Tax payers are happy with the digital payments facility and the ease with which they can track property tax balances."

City Official, Pune, India

Key Opportunities

There is now an opportunity for governments to build upon these platforms and their popularity with both city governments and local communities, pursuing initiatives to standardize and streamline other government payments and unlock resilience-focused goals and services around them. For example, the City of Cape Town has used the centralization of its digital payments collection system to inform 'ability to pay' and rates-stress policies and to identify populations who may be financially vulnerable and struggle to pay for services.¹ In cases such as this, anonymized, aggregated data derived from municipal tax collection can guide equitable policy making and service provision. Other approaches cities can explore include:

Streamlining tax and fee collection through single digital government platforms

A single digital government platform is a centralized system that enables city government finance management and digitalization, streamlining the process for accepting and processing government payments. This can include government multi-service apps that consolidate multiple city services into a single, user-friendly interface, allowing residents and visitors to access varied government functions such as rates and bill payments and service requests from their smartphones and other devices.

Through streamlining city taxation and payment acceptance, cities can significantly enhance inclusivity for city residents. Simplifying payment processes and making them more accessible by providing 'one-place-to-pay' for residents and visitors promotes broader economic participation and can also improve compliance and reduce fraud, key to the economic sustainability of cities. As Covid-19 cases surged, the [New Delhi Municipal Council](#) made 49

¹ *Cities that Thrive survey data (2024).*

civic services fully online through a government platform accessed via a single sign-on system. The system provided a tool to maintain critical service continuity during an emergency, and continues to allow the public to make payments and access all services in one place without the need for multiple registrations, showing how cities can boost their long-term resilience through experimentation during crises.

Ukraine's Diia e-government platform is a further example of effectively streamlining payments for improved economic efficiency and community accessibility. Diia is the Ministry of Digital Transformation's approach to digitalizing all payments to government. By developing Diia as a multi-service app, Ukraine has been able to provide a single portal for people and businesses, including providing access to digital ID, providing ongoing services under wartime conditions.

Government wallets for use across services

Digital wallets - a type of financial transaction app that runs on any connected device and securely stores payment information and credentials - can provide a 'front-door' to government services for residents. By offering an integrated platform, digital wallets enable convenient payment of taxes, utilities, and other city services. This innovation can securely consolidate identity verification, credential storage, digital payments, and communication, streamlining residents' interactions with various government services in one central portal.

CarePay, used in Kenya and Nigeria, provides mobile health wallets which allow patients, premium payers, insurers, and healthcare providers to send and receive healthcare funds. Services built around this include enrollment and premium collection, beneficiary identification, claims management, and data-powered services, with the aim of facilitating better and more convenient healthcare and improving population health.



CITY STORIES_

How digitalizing Porto Alegre's taxation system supported economic resilience

Porto Alegre, Brazil, had long grappled with a high rate of non-payment of taxes. During the pandemic, they decided to use digital tools to improve levels of payment, thus ensuring that funds would be available for city services and programs, from healthcare to education.¹

The first tax program to be digitalized was the city's property tax system - one of the city's major sources of income - under the [IPTU](#) Digital program, created by the country's Finance Ministry. The program gave property owners the ability to pay online (replacing a paper-based system), easily access tax information, and even receive notifications when taxes come due. The program also incorporates a behaviorally informed approach by, for instance, providing discounts for those who pay early.²

The city has seen tax payment rise since implementing the program. "There were a lot of people who weren't paying," said Bruno Beltrame, the city's Head of Resilience. "Now they are." While the program is not specific to Porto Alegre, its implementation by the city is held up as a gold standard in Brazil, with other cities seeking to learn from the city's experience.

¹ *Cities that Thrive* survey data (2024); *Cities that Thrive City Official interview* (2024).

² *Ibid.*



CITY STORIES

Using data to boost tax collection in Matola

Matola, Mozambique, a city of just over one million residents, is located just outside the nation's capital, Maputo. An industrial and manufacturing center, the city was not collecting enough taxes to support the municipal budget. Moreover there was little data on taxpayers, and tax records were spotty and analog - all of which hindered the city's efforts.¹

Outdated tax infrastructure as an obstacle to tax collection

The city thought that taxpayers were simply avoiding paying what they owed. With the help of the African Smart Towns Network (ASToN), a knowledge hub for African city governments and civic organizations, and Brink, an innovation agency, the city shed new light on the issue.

Through a series of workshops and consultations, it became clear that the city's tax collection infrastructure itself was an obstacle to tax collection. Dense bureaucracy around tax collection was coupled with a lack of clear information about how to pay, and manual, paper-based processes made payments difficult even when people did manage to navigate the system.²

Digitalization to make bureaucracy more accessible

In response, the city initially decided to create a central database for vehicle taxes. But there were obstacles, as literacy and internet connectivity rates in the city were low. Thus the city decided to simplify things by allowing residents to pay through a mobile app (serving around half the population, that owns or can access a mobile phone) or website.

The city also started a pilot project for market taxes. Merchants at the city's central market are supposed to pay a small daily tax to the city, which owns the market, in lieu of rental payments. However, merchants were hesitant to leave their stalls and lose time at work to navigate the city's tax bureaucracy.

The solution: to bring the bureaucracy to the stalls. The city now hopes to enable merchants to pay with cash or through a contactless payment device in the market, with no need to leave their stalls.³

The importance of fresh eyes

These initiatives show that sometimes persistent problems can be addressed by fresh approaches and simple solutions. The role of outside consultants in this process was critical, as they were able to offer local officials clarity and an outsider's perspective on entrenched habits and processes, as well as an interactive approach that embraces trial and error, and the ability to transcend organizational silos in ways that lead to greater collegiality and collaboration.⁴

1 Brink 2024. A city problem, not a citizen problem. Brink. <https://hellobrink.co/a-city-problem-not-a-citizen-problem/>

2 Ibid.

3 Ibid.

4 Ibid.

DIGITAL PAYMENTS TO PEOPLE AND BUSINESS: SUPPORTING CITY COMMUNITIES

Status



Resilience outcomes explored here



Digital payments from city governments to residents, visitors, and businesses enable the efficient distribution of funds, including regular and emergency payments or remittances, and distribution of financial aid. They include electronic direct bank transfers and prepaid cards, mobile wallets, and open payments' systems.

Cities increasingly recognize the benefits of digital payments' disbursements to quickly and efficiently send funds to residents and local businesses, especially in times of crisis. The Covid-19 pandemic acted as a catalyst for many cities to digitize disbursement processes and reduce reliance on physical cash. **43% of cities that we surveyed have digitized at least part of their process for distributing funds to residents. However, most of these cities have only digitized standalone elements of their disbursement schemes** (for example, digital payments for a single program).

There is now an opportunity to take a more comprehensive, process-reform based approach, starting from the needs of the local community. The 2018 World Bank ASPIRE report puts the average global spending on social safety nets at 1.5% of GDP.¹ While there is no "one size fits all" solution, governments that offer multiple payment methods make these funds more user-friendly and accessible. For example, engaging digital payments, from prepaid cards to mobile wallets, at a whole-of-government level can help ensure aid and stimulus payments go to people who need it quickly, and can be easily accessed.² These improvements can bolster economic opportunities, encourage social equity, and support residents and small businesses in the face of crises.

Key Opportunities

Prepaid cards and digital vouchers for social support programs and disaster relief

Prepaid debit cards can facilitate disbursing payments, particularly in crisis situations or in instances where the delivery of rapid aid is required.³ As part of its Covid-19 pandemic response in 2020, the Seoul Metropolitan Government issued emergency disaster relief funds from the city to residents living below the national median income, through prepaid cards. The program facilitated increased operational effectiveness, allowing, for example, the inclusion of foreign residents in the program, and aiding a streamlined disbursement process. The use of prepaid cards also enabled the retrospective analysis of the program's effectiveness using aggregated payments data, which indicated the stimulus payment had increased consumer spending by 12%.⁴

Virtual accounts and payment credentials to bolster inclusion and equity, including for underbanked communities

A virtual account, accessible online or via mobile apps, can serve as a hub for receiving emergency funds, fiscal stimulus, and incentive payments without needing a traditional bank account.⁵ Virtual payment credentials, such as virtual cards, digital tokens, or e-wallet IDs, can be offered by cities to enable residents to make transactions securely

¹ World Bank 2018. *The State of Social Safety Nets 2018*. World Bank. <http://hdl.handle.net/10986/29115>

² Visa & AT Kearney 2022. *The Transformational Power of Digital Payments for Governments*. <https://usa.visa.com/content/dam/VCOM/global/run-your-business/documents/visa-kearney-the-transformational-power-of-digital-payments-for-governments.pdf>

³ Ku, I, Ham, S, & Moon, H 2023. 'Means-tested COVID-19 stimulus payment and consumer spending: Evidence from card transaction data in South Korea'. *Economic analysis and policy*, 78, 1359–1371.

⁴ Koh, K & Lyuo, W 2020. 'Spending impact of COVID-19 stimulus payments: Evidence from card transaction data in South Korea'. *Singapore Management University*. https://ink.library.smu.edu.sg/soe_research/2441/

⁵ Visa & AT Kearney 2022. *Next Generation Government Disbursement Programs*. <https://www.visa.com.hk/dam/VCOM/regional/ap/singapore/global-elements/documents/visa-kearney-public-disbursement-paper.pdf>

and easily, online or in-person. These credentials facilitate immediate access to funds and reduce the need for physical payment cards or cash.

GovWallet is a module integration developed by Singapore GovTech's Government Digital Services (GDS) team to provide an alternative means to distribute government pay-outs - as either cash or credits. GovWallet was initiated as an internal pilot project in GovTech when the team was looking for a way to credit staff benefits. Since then, it has received interest from many organizations for use in household and social assistance programs, sector-specific relief programs, and to recognize and incentivize staff.¹

GovTech also collaborated on the creation of GovCash, developed in 2021, with the Central Provident Fund Board (CPF Board) to administer the Workfare Income Supplement scheme, replacing cheque issuance to more than 6,200 Workfare (a savings' encouragement and housing and healthcare scheme) recipients. Unbanked residents can withdraw their payouts from ATMs that have been integrated with GovWallet, or spend their payouts via the LifeSG app.²

¹ Visa & AT Kearney 2022. The Transformational Power of Digital Payments for Governments. <https://usa.visa.com/content/dam/VCOM/global/run-your-business/documents/visa-kearney-the-transformational-power-of-digital-payments-for-governments.pdf>

² Ibid.



CITY STORIES_

Mexico City: disbursements to bolster educational outcomes

Mi Beca para Empezar (My Scholarship to Start) is a major social program for which every child registered in a school in Mexico City is eligible, from kindergarten through to end of secondary school. This includes children who attend school in Mexico City but live elsewhere in the state, for example because their parents are workers in the city.

The program consists of three components: a monthly financial scholarship, financial aid to cover school supplies and uniforms, and medical insurance. The city provides these benefits through a physical card issued to students, as well as a mobile application that parents of enrolled schoolchildren can download.¹

Payments are limited to specific items, ensuring the scholarship is spent on education-related outcomes. Many shops are eligible to receive payments via the program, from large multinational retailers to micro-SMBs, thus contributing to the resilience of hyperlocal economies across the city. In the future, aggregated, anonymized spending data from the program could also be used to inform public policy decision-making.²

¹ ADIP 2024. Mi Beca para Empezar. <https://registro.mibecaparaempezar.cdmx.gob.mx/>; Interview with City Official, Mexico City.

² Ibid.



CITY STORIES

WASHINGTON, D.C.: PROVIDING RESIDENTS WITH PREPAID CARDS TO ENHANCE FINANCIAL INCLUSION

Washington, D.C. sought to digitalize its system of disbursements to city residents. While its existing systems allowed for direct deposit, most eligible residents opted for paper checks (for example, due to being unbanked).¹

As a result, the city found itself printing numerous paper checks - one city agency alone found itself processing some half a million checks every year - and sending them out through the mail. The process was cumbersome, time-consuming, expensive, and environmentally unsustainable.

Digitizing payments to residents

As a result, the city decided to shift to prepaid debit cards. Rather than issue checks every month, the city distributed physical debit cards once, and now transfers the relevant payments digitally at the beginning of every month, saving significant time and effort.²

The city also saved money, and reduced its use of paper. For payment recipients, the cards eliminated the need to wait for a check to arrive in the mail every month and cash it at a bank. For those without bank accounts, the cards are particularly useful, enabling them to withdraw funds from ATMs or use them to directly purchase goods and services.

Creating infrastructure for distribution of funds during a crisis

The program was also considered highly effective in terms of preparing for emergency situations. In a crisis, when other financial infrastructure might be compromised or temporarily offline, the debit cards could serve as pre-existing infrastructure to transfer payments of various kinds to residents in need.³

¹ Visa 2023. How Visa Prepaid Cards are being used to Streamline Government Payments in the District of Columbia. Visa.

² Ibid.

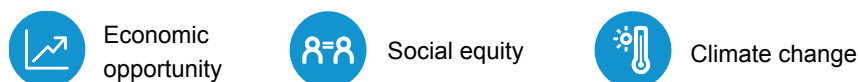
³ Ibid.

DIGITAL PUBLIC FINANCE AND PURCHASING: CREATING RESILIENT LOCAL ECONOMIES AND DIVERSIFIED GOVERNMENT SUPPLY CHAINS

Status



Resilience outcomes explored here



Digital public finance and purchasing is the use of digital technologies and online platforms to streamline and automate the process of sourcing, acquiring, managing, and monitoring the goods and services needed by government agencies and public sector organizations.

City governments worldwide collectively spend US \$6 trillion annually on goods and services.¹ While city budgets vary greatly, public purchasing is always a powerful policy lever and is a key mechanism by which city governments access new ideas and solutions to best serve their communities, from education to healthcare. *How* public purchasing is conducted meaningfully impacts both purchasing decisions and the eventual outcomes of this procurement. Digital public purchasing platforms create visibility, opening the door to suppliers who would otherwise be locked out; allow governments to shape local markets towards resilience goals such as city decarbonization; and enable them to consider key trade-offs, such as efficiency versus climate-impact outcomes.²

63% of cities surveyed have digitalized part or all of their public purchasing and commercial payments processes. Cities are already using digital processes to streamline invoicing and payments' disbursement, recognizing efficiency gains. However, these processes are often only partially digitalized or not integrated at a whole-of-government scale.³ This represents an untapped opportunity for city governments to bolster their strategic planning and resilience efforts. By using digital commercial payments, they can streamline financial operations, support transparent fund disbursement, and gather data for informed decision-making.

Stories of success are already emerging. For example, Mexico City's digital procurement portal, Tianguis Digital, provides fully online registration and bidding processes for vendors.⁴ City teams can use the platform to create contracts and access legal advice, and ensure alignment with international procurement standards. City residents can also access dashboards displaying spend data by contract method, department, and project, contributing to transparency and public trust.

Digital purchasing can also help to diversify government supply chains, and support city equity and inclusion. For example, Seattle's development of a digital procurement platform simplifies the process for city departments to make small purchases and enhances access for Women-owned or Minority-owned Business Enterprises (WMBEs), making government contracts more accessible to traditionally underserved groups (see City Story). Transport for London has sought to address under-representation among its suppliers' workforces with the assistance of a digital platform that allows vendors to self-assess their own workforce's diversity against those in the wider sector using anonymized workforce data and census data through an online dashboard.⁵

1 Markey, S & Watkins, A 2024. *How cities can flex their purchasing power to stimulate innovation*. World Economic Forum. <https://www.weforum.org/agenda/2024/04/cities-public-procurement-innovation/>

2 Peñasco, C, Anadón, L & Verdolini, E 2021. 'Systematic review of the outcomes and trade-offs of ten types of decarbonization policy instruments'. *Nature Climate Change*, 11(3), pp.257-265.

3 Irani, Z, Abril, R, Weerakkody, V, Omar, A & Sivarajah, U 2023. 'The impact of legacy systems on digital transformation in European public administration: Lesson learned from a multi case analysis'. *Government Information Quarterly*, 40(1), p.101784.

4 Tianguis Digital, 2024. Tianguis Digital. <https://www.tianguisdigital.cdmx.gob.mx/>

5 Mayor of London 2023. *Responsible Procurement Case Studies 2022/23*. <https://ldc-meetings.london.gov.uk/documents/s68779/Item%2013%20-%20PUBLIC%20-%20Appendix%204%20-%20case%20studies.pdf>

Digital purchasing tools, such as public employees purchasing cards, can also streamline purchasing processes and enable swift and flexible responses to immediate needs during crises. Cities such as Birmingham, UK, and New York City and San Antonio, USA, have all introduced purchasing card programs to support government purchasing and payments.

Key Opportunities

Boosting and monitoring Green Public Procurement (GPP) through digital public purchasing

City governments can under-appreciate their own procurement power as a vital environmental policy instrument.¹ Directing government procurement spending toward more sustainable projects represents a major opportunity not only to reduce emissions created by governments' own operations, but also to encourage the local (and wider) development of technologies capable of mitigating and helping societies adapt to the climate crisis. When new technologies mature beyond R&D, the state can create a market "by serving as the first customer", pulling innovations "down the learning curve" to cheaper, dependable production.² Cities have a key role to play, for example, in procuring innovative green transportation solutions.

Governments simply decarbonizing their own assets and operations may not go far enough, because so many of their functions are carried out with private sector companies, whose own carbon footprint may not show up on the government balance sheet. To pursue achieving net-zero emissions, governments may need to verify that the products and services that they procure are also carbon neutral.

Many products and services that city governments purchase, such as large-scale infrastructure projects and public transportation, play a significant role in mediating environmental outcomes. For example, purchasing wood from sustainably managed forests could help combat deforestation. Such procurement has been termed Green Public Procurement (GPP), a range of processes to acquire products, services, and works with a significantly reduced environmental impact compared to the average for identical products and services. GPP forms one component of Sustainable Public Procurement (SPP), which includes economic and social factors in addition to environmental considerations.³

A key challenge with monitoring green public purchasing is collecting spend data from disparate public units. But having this aggregated purchase data enables assessing how much of total spending is on green products, services, and works. Digital procurement platforms can help with this data collection. Electronic purchase reporting may be particularly helpful when it comes to green purchase monitoring. It relies on software that logs purchases as they happen. When public units use a single purchase reporting system or an interoperable set of reporting tools, aggregating purchases can be as simple as downloading an automatically generated dataset, which can then be analyzed.⁴

Enhanced economic opportunity and SMB inclusion

Entrepreneurs can find public tendering processes inscrutable and think government agencies are closed-minded regarding new solutions. For their part, public servants often feel in the dark when it comes to public-purpose innovation. In a recent survey, half of 167 cities globally described difficulty in identifying partners and suppliers as one of the greatest obstacles to achieving the Sustainable Development Goals.⁵ While procurement reform may sometimes be needed, there are myriad examples of currently existing procurement vehicles, including challenge-led approaches, that can be deployed.

Beyond picking appropriate procurement processes, platforms matter too. Digital procurement can unlock efficiencies for both cities and vendors. **Digital procurement platforms provide cities with significant opportunities to drive local economic growth and promote equity and inclusion.** By streamlining procurement processes on digital platforms and e-marketplaces, SMBs and local providers are more easily able to access and compete for government contracts. Digital procurement platforms and marketplaces can also integrate tools and resources to support smaller suppliers in navigating the complexities of procurement processes and compliance requirements, helping to level the playing field. For example, alongside opportunities for businesses to access current bids, the supplier portal for Baltimore, USA, also provides educational resources such as How-To Guides and FAQs, as well as providing training sessions to help suppliers understand the procurement process and compliance requirements.

¹ *Cities that Thrive survey data (2024).*

² Janeway, W. 2021. *A Greentech Bubble?*. Project Syndicate. www.project-syndicate.org/commentary/greentech-boom-needs-state-follow-through-by-william-janeway-2021-03

³ StateUp 2024. *States Regenerate*. <https://stateup.co/nebula/product/states-regenerate/>

⁴ Ibid.

⁵ Makiela, Z, Stuss, M, Mucha-Kuś, K, Kinelski, G, Budziński, M & Michalek, J 2022. 'Smart City 4.0: Sustainable Urban Development in the Metropolis GZM'. *Sustainability*, 14(6), p.3516.

*“Governments are increasingly interested in engaging public procurement both to contribute to mitigating harmful climate impacts and to enable more diverse, robust supply chains. **Digitalizing public procurement has a key role to play in enabling these different forms of resilience.** Environmental criteria such as emissions must be weighed against non-environmental criteria, such as perceived reliability or vendor inclusivity. These criteria may not always align with each other. Here, digital marketplaces can facilitate huge process improvements. For example, they can engage AI to match suppliers to assessment criteria, by means of online learning algorithms.”*

Prof. Paolo Turrini, AI for Social Good, Warwick University



CITY STORIES

Seattle's development of a digital procurement system that fosters inclusion and equity

Municipal procurement is often inaccessible to small businesses

The city of Seattle spends US \$724 million a year on procurement from the private sector. While public-sector procurement is a large market (spending US \$16 trillion/year globally), it is often inaccessible to small businesses, which are not equipped to compete for and land large government contracts.¹

Meanwhile, public-sector organizations often have difficulty finding small-business vendors and carrying out small purchases without having to go through cumbersome bureaucratic procedures.

When the Covid-19 lockdowns began in 2020, small businesses – particularly Women-owned or Minority-owned Business Enterprises (WMBEs) – were particularly hard hit, and many went out of business. Seattle set out to support WMBEs through its procurement process, while empowering city departments to make small purchases without going through the usual procurement process.²

Streamlining a cumbersome process for sourcing vendors

The city decided to streamline the procurement process for sourcing small purchases of goods and services. It set up an online portal for city departments to use, with a user-friendly interface designed like an e-commerce platform, enabling easy point-and-click transactions.³

This replaced a process in which city officials were compelled to search for vendors in multiple directories, reach out to potential vendors individually for information, and navigate lengthy PDF contract documents. The process also made more small businesses and WMBEs visible to city officials.

Thus far, the project's biggest challenge has been getting the word out about the platform to the city's various departments. By engaging directly with officials on a one-to-one basis, the city is making progress in shifting smaller purchases to the new portal by demonstrating the possible time and cost savings that can be had, as well as the benefits to local businesses.⁴

¹ OECD 2023. Government Marketplaces for Government Procurement Teams. OECD. <https://oecd-opsi.org/innovations/government-marketplaces-for-government-procurement-teams/>

² City of Seattle 2024. Women- and Minority-Owned Businesses. <https://www.seattle.gov/purchasing-and-contracting/social-equity/wmbe>

³ OECD 2023. Government Marketplaces for Government Procurement Teams. OECD. <https://oecd-opsi.org/innovations/government-marketplaces-for-government-procurement-teams/>

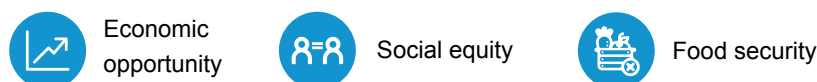
⁴ Ibid.

DIGITAL FINANCIAL SMB SUPPORT AND ENABLEMENT: HELPING LOCAL ECONOMIES FLOURISH

Status



Resilience outcomes explored here



Digital financial enablement and support of SMBs: For many SMBs, thriving today requires participation in the digital economy, both to serve local customers and access broader markets. Digital financial enablement of SMBs comprises digital and financial education and resources to enhance SMBs’ understanding, access to, and use of digital financial solutions and innovations.

SMBs make up 90% of global businesses and generate over half of all jobs.¹ These businesses, critical to city economies and local employment, are also often among the most vulnerable to crisis and economic disruptions.² This vulnerability can stem from challenges such as limited digital connectivity, disruptions in supply chains, and constraints in accessing digital financial services.

City governments can support SMBs to participate in the digital economy, for example, through facilitating SMBs digital payments’ acceptance solutions and enabling SMB loans and credit lines to strengthen cities’ economic and innovation ecosystems.

Key Opportunities

Incentivize or fund digital and financial literacy initiatives

There is strong evidence that digital literacy can improve business processes and productivity to enhance company performance and encourage local economic prosperity.³ To support this outcome, cities can incentivize or fund digital upskilling programs, on topics from e-commerce to digital marketing. Digital literacy should be paired with financial literacy. For many SMBs, business decisions can be challenging to make if they are not equipped to pinpoint key financial metrics to measure performance, or access financial tools to boost their delivery, sales, and accounting.

The Covid-19 pandemic provided a catalyst for many cities to begin championing local uptake of digital payments’ acceptance by running consumer incentive campaigns and supporting SMB digital transformation activities. Singapore’s [SG DigitalOffice](#) initiative and New York City’s [Business Express Service](#) both provide local businesses with digital and financial education and support. Faced with a large informal labor market and severe impacts from the Covid-19 pandemic, Salvador, Brazil, collaborated with the Resilient Cities Network and Visa to launch two key initiatives, the Digital School and Talent Booster, to empower small business owners and workers with digital skills and tools.⁴ The Digital School aimed to equip small firms with digital knowledge, while the Talent Booster program provided individuals with training courses for programmers and market agents— allowing SMBs to upgrade and adopt digital solutions.⁵

¹ World Bank 2019. *SME Finance*. World Bank. <https://www.worldbank.org/en/topic/sme/finance>

² Visa & AT Kearney 2022. *Digital enablement of small and medium-sized businesses*. <https://usa.visa.com/content/dam/VCOM/global/run-your-business/documents/visa-kearney-digital-enablement-of-small-and-medium-sized-businesses.pdf>

³ World Bank 2023. *Digital Development: Global Practice*. World Bank. <https://www.worldbank.org/en/topic/digitaldevelopment/overview>

⁴ Visa & Resilient Cities Network 2021. *Digital Solutions for Urban Resilience in Latin America: Case Studies*. <https://resilientcitiesnetwork.org/downloadable-resources/Programs/Digital-Solutions-For-Urban-Resilience-In-Latin-America.pdf>

⁵ Visa & AT Kearney 2022. *Digital enablement of small and medium-sized businesses*. <https://usa.visa.com/content/dam/VCOM/global/run-your-business/documents/visa-kearney-digital-enablement-of-small-and-medium-sized-businesses.pdf>

Support small business payments' acceptance

Enabling payments' acceptance online and at physical locations through point-of-sales' terminals can help businesses generate revenue and improve the experience of their customers. It also offers an opportunity to bring more businesses into the formal financial economy, reducing the VAT gap and shadow economy that many cities face. Panama City has digitalized local market payments, providing access and security for merchants and customers alike.¹ In Quito, Ecuador, 89% of the city's businesses are classified as microbusinesses. These entities and their workforces are particularly susceptible to economic disruptions.² In the face of the Covid-19 pandemic, the city deployed digital payments' acceptance, as well as connecting local producers and SMBs to strengthen local agricultural supply chains and streamline finances.³ The initiative, co-designed with local businesses, fostered the establishment of local agricultural centers and markets that allowed for local sales of excess products.⁴

DIGITAL FINANCIAL AND PAYMENTS DATA INSIGHTS: IMPROVING RESILIENCE POLICY, PLANNING, AND DELIVERY

Status



Resilience outcomes explored here



Economic opportunity



Economic fluctuations

Digital financial and payments data is information gathered when consumers use card payment and other remittance methods to complete transactions. Utilized on an aggregated and anonymized basis, data from payment transactions can provide cities with granular information about their economies and communities to support urban planning, policy development, and program delivery, and enable analysis of trends in different geographies, economic sectors, and consumer segments.

Cities are beginning to experiment with using payments data, but only 40% of cities surveyed are currently engaging payments data to inform any aspect of decision-making. Less than 35% of cities surveyed report having a plan or priority to use payments data for strategy work such as economic planning and forecasting. The group that is using spend data is often engaged in small-scale pilot use. This represents a major untapped opportunity for city governments to bolster their strategic planning and resilience efforts.

Cities are already using payments data to detect fraud, enhance tax compliance, and boost revenue collection, but few cities have developed systematic approaches to using payments data. Success stories exist. Between 2009 and 2014, New York City improved fraud detection in tax returns by 40% by analyzing tax and business license data to identify underpaying businesses.⁵ Between 2015 and 2019, Charlotte, North Carolina, in partnership with Visa, used insights into city visitor behavior and spending habits, derived from depersonalized spend data, to inform a successful tourism campaign.⁶ However, systematic use of payments data to inform city decision-making, remains rare.

Payments data can uncover detailed insights into the preferences and habits of residents and visitors, which can be used to tailor service delivery and inform the design and evaluation of policies and programs. There is also significant potential for cities to use public financial technologies data more extensively for modeling, and to inform policy and planning aimed at improving city resilience.

1 Visa & Resilient Cities Network 2023. *Panama City is digitalizing the payment systems of local markets to strengthen businesses and increase the resilience of Panama City's commercial systems.*

2 Visa & AT Kearney 2022. 'Digital enablement of small and medium-sized businesses.' <https://usa.visa.com/content/dam/VCOM/global/run-your-business/documents/visa-kearney-digital-enablement-of-small-and-medium-sized-businesses.pdf>

3 Ibid.

4 Ibid.

5 Wiseman, J & Goldsmith, S 2017. *Ten Great Ways Data Can Make Government Better.* Data-Smart City Solutions. <https://datasmart.hks.harvard.edu/news/article/ten-great-ways-data-can-make-government-better-1041>

6 Visa 2022. *Charlotte Case Study - Visa Destination Insights.* Visa. <https://usa.visa.com/content/dam/VCOM/regional/na/us/products/documents/vdi-crva-case-study.pdf>

KEY OPPORTUNITIES

Using payments data to support city crisis response and management

1

Crisis prediction and prevention

By monitoring payments data for unusual patterns, cities may be better equipped to predict and prevent crises. For example, a sudden drop in consumer spending could indicate an impending economic downturn, allowing city officials to take preemptive measures. Combining data on healthcare-related purchasing patterns with search data analysis could enable cities to accurately predict near-future outbreaks of diseases, including pandemics.¹

[Switzerland's Monitoring Consumption Switzerland \(MCS\) project](#) demonstrates how payments data insights can enhance resilience and crisis management. During the Covid-19 pandemic, MCS provided real-time insights into consumer behavior changes in response to various policy measures. For instance, MCS data helped assess the impact of lockdowns on consumer spending, revealing shifts in economic activity across different sectors and regions in Switzerland.²

2

Disaster response and recovery

During and after disasters such as earthquakes or conflict, payments data can help in assessing the impact on local economies and identify the most affected sectors, businesses, or locations within a city. This data can inform the allocation of resources and financial support to the most affected areas, speeding up recovery efforts.

[In the wake of Hurricane Odile](#), which impacted the Mexican state of Baja California Sur in late 2014, a project examined financial transaction data to determine the impacts of the natural disaster on local livelihoods. The initiative, which analyzed daily point-of-sale transactions and ATM withdrawals, allowed analysis of the way people prepared for, and recovered from, the disaster, with meaningful insights for local emergency response efforts, and for evaluating urban economic loss following natural disasters.³

3

Public health crises

During public health emergencies, like pandemics, payments data can offer insights into how people's spending on health-related goods and services changes over time and place. This can help in directing resources to where they are most critically needed, enhancing the city's capacity to respond to health crises.

"[The] Covid [pandemic] was a really expansive point in that [data insights] journey where we started to look at epidemiological models, trying to bring those in to monitor our [city's] response [and] our response programs in relation to [...] epidemiological models. [...] We're also looking at things like economic data, social economic conditions, etcetera, and bringing that in to really start bolstering our internal [insights, informing] what we are doing programmatically and how we're aligning [and creating] our own data".

City Official, Cape Town

Using payments data to support a thriving economy

1

Economic monitoring

Data of real-time consumer spending behavior can greatly improve our knowledge on the state of city economies. Payments data of real-time behavior can provide insights into the economic health of different sectors within a city. By analyzing spending patterns, city planners and policymakers can identify industries that are thriving and those that are struggling, enabling targeted interventions to support economic resilience.

1 Lamos, V, Majumder, M, Yom-Tov, E, Edelstein, M, Moura, S, Hamada, Y, Rangaka, M, McKendry, R & Cox, I 2021. 'Tracking COVID-19 using online search'. *NPJ digital medicine*, 4(1), p.17.

2 Brown, M, Fengler, M, Huwyler, J, Koeniger, W, Lalive, R & Rohrkemper, R 2023. 'Monitoring consumption Switzerland: data, background, and use cases'. *Swiss Journal of Economics and Statistics*, 159(1), p.4.

3 Minges, M 2019. *Disruptive technologies and their use in disaster risk reduction and management*. ITU. https://www.itu.int/en/ITU-D/Emergency-Telecommunications/Documents/2019/GET_2019/Disruptive-Technologies.pdf

2

Fostering innovation and entrepreneurship

Payments data can be valuable for entrepreneurs and innovators, revealing gaps in the economy and local needs that have not been met. By facilitating access to this data, in a secure, privacy-protecting way, cities can encourage the development of new businesses and technologies that address urban challenges, contributing to economic diversification and resilience.

3

Supporting small businesses

Small businesses are crucial to urban resilience, providing employment and services that keep cities flourishing. Payments data can identify trends in residents' behavior that impact these businesses - including footfall in different areas at different times of day, and surges in demand for different services. With these insights, appropriate support schemes can be designed to help small businesses thrive and adapt to changing economic conditions.

The [impact of Kitchener, Canada's 'Downtown Kitchener Patio Program'](#), designed to assist local businesses recover from the Covid-19 pandemic, was assessed by the Canadian Urban Institute, utilizing credit card and payments data alongside footfall data. The study revealed that the program significantly influenced local economic activity, with downtown evening foot traffic increasing by nearly 40% during the summers of 2021 and 2022, when compared to 2020. Additionally, businesses in Kitchener generated an estimated CAD \$37 million in sales, with CAD \$3.2 million directly attributed to the program.

Using payments data to bolster urban planning and public service provision

1

Infrastructure investment and urban planning

Analysis of payments data can reveal patterns in how people use urban spaces and infrastructure. Urban planners can use this data to inform decisions on where to invest in public transport, parks, or other community facilities. By understanding the flow of economic activity, cities can plan infrastructure projects that best support the needs of their communities.

2

Improving public services

Payments data can also support the planning and delivery of public services. For instance, analyzing payments' data at public facilities (like recreational facilities, green spaces, or public transport systems) can help optimize operational hours and resource allocation to meet demand more effectively.

[Singapore's Land Transport Authority \(LTA\)](#) collects anonymized data from the city's commuters' fare cards to manage their bus fleet, using these insights to identify commuter hotspots and inform decision-making. The LTA has reported that these insights have supported a 92% decrease in the number of bus services experiencing crowding issues, despite a year-on-year rise in average bus ridership, along with a reduction of 3 to 7 minutes in the average waiting time on the most crowded bus routes.¹

3

Fostering social equity and inclusion

By examining payments data through the lens of social equity, cities can identify disparities in economic activity and access to services among different communities. This enables tailored actions to address inequalities, helping to ensure that resilience-building efforts benefit all segments of the population, including vulnerable groups.

[Colombia's Ingreso Solidario program](#), initiated in response to the Covid-19 pandemic, distributed emergency relief to nearly 3 million households through an unconditional emergency payment transfer, distributed through multiple channels, including mobile wallets. The program reached 1 million previously unbanked households, with over 60% of these households headed by women. The digital emergency transfer both facilitated the real-time provision of financial aid to residents in need, and enabled ongoing monitoring and assessment of the program's impact through anonymized spend data collection.²

¹ Smart Nation Singapore 2024. *Enhancing Public Transport Using Data*. <https://www.smartnation.gov.sg/initiatives/transport/open-data-analytics/>

² OECD 2021. *Development Co-operation Report 2021: Shaping a Just Digital Transformation*. <https://doi.org/10.1787/ce08832f-en>; Davico-Thaler, G & Tellez-Merchan, C 2021. *Colombia's Ingreso Solidario: Public-private Collaboration In Covid-19 Emergency Payments Response*. Better Than Cash Alliance. <https://www.betterthancash.org/news/learning-series-covid-colombia>



CITY STORIES

Singapore: Analyzing payments data to revitalize tourism post-pandemic

Singapore is one example of a city that has engaged payments data with the specific aim of boosting its resilience. To help the rejuvenation of businesses in the tourism sector in the post-pandemic recovery, the Singapore Tourism Board (STB) and Visa engaged payments data to help businesses better target their consumer product offerings and navigate challenging times.¹ Using the data helped to identify and support the most impacted business with tailored approaches to doing business against a backdrop of changed consumer expectations and industry operations.

1

Orchard Road and Marina Bay were the hardest hit precincts.

Visitors frequented Orchard Road and Marina Bay for their shopping needs - A significant proportion (76%) of their retail spend during their stay in Singapore occurred in the Orchard Road and Marina Bay precincts.

2

Diversity of spend varies across top tourism precincts

Orchard Road enjoyed the widest retail spend diversity with fashion, watches and department stores comprising 74% of retail spend by visitors shopping in the precinct.

Marina Bay precinct appealed to visitors with its retail mix of high-end luxury fashion boutiques. Bugis precinct stood out for electronic goods spend, which was not a common category of spend at other precincts.

3

Visitors spent a considerable amount of time within 1km of their hotel.

With visitors spending at least 40% of their waking hours within 1km of their hotel, they are most likely to explore and spend more in places within their vicinities. Due to the lack of visitors in the current climate, tourism-related businesses such as retail, restaurants and attractions around the hotel were directly impacted, especially in the key tourism precincts.

4

Local brands lacked online presence.

Due to the lack of online presence, local brands were more vulnerable to the adverse economic impact of the pandemic. Unable to capture the growth of online spend, local brands experienced a double-digit decline in revenue. On the other hand, non-local brands experienced an increased demand on their e-commerce platforms.

5

More local consumers are spending online.

85% of Singaporean consumers intend to continue or increase their online purchases. There is significant growth in online spend across the top five merchant categories including restaurant, commercial, healthcare, entertainment and retail. Consumers' online spend was particularly pronounced in the restaurant category.

¹ Singapore Tourism Board & Visa, 2020. Impact of Covid-19 on tourism in Singapore and the road to recovery. www.stb.gov.sg/content/dam/stb/documents/mediareleases/Impact%20of%20Covid-19%20on%20tourism%20in%20Singapore%20and%20the%20road%20to%20recovery%20and%20transformation%20by%20STB%20and%20Visa.pdf



CITY STORIES_

Cape Town: Using data for resilience in the face of drought and pandemic

A key goal of Cape Town’s resilience strategy is to “deploy smart technology and predictive analytics to inform pre- and post- disaster planning.”

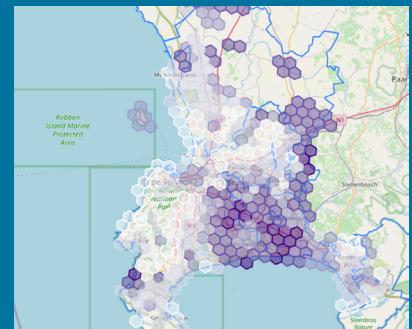
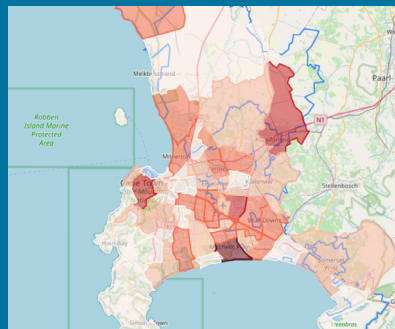
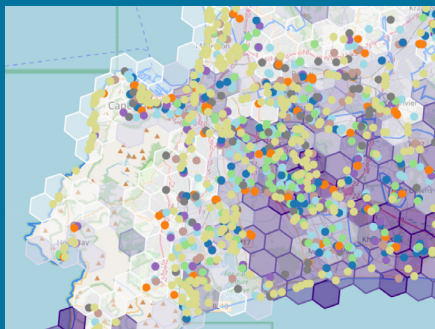
A lack of aggregated data to support crisis management

One of the lessons of the Covid-19 pandemic for resilience officials was the need to aggregate data on the vulnerability of communities, especially health and socioeconomic data, as a means towards better understanding the city’s capacity to deliver services to bolster community wellbeing in times of crisis.

Addressing the challenge with Vulnerability Viewer

To address this challenge, city officials decided to create a real-time, location-based interface for assessing how shocks and stresses were affecting local health and economic outcomes, in order to guide the city’s response during a crisis.

This became the “**Vulnerability Viewer**,” a map-based interface which aggregates multiple municipal datasets, which serves as an internal tool for city officials. While still in beta version, the tool is continually evolving, with city officials regularly updating the underlying datasets.



Screenshots from Cape Town’s Vulnerability Viewer (beta version). Courtesy of the City of Cape Town.

The role of payments data

During public health emergencies, like pandemics, payments data can offer insights into how people's spending on basic goods and health-related services changes over time and varies from place to place. One aim for future development of the project is to integrate anonymized retail data from local businesses, so the city can track changes in purchasing patterns and potential shortages of critical goods, such as groceries and medicines, in real time, and respond accordingly.

“If we start seeing that people’s buying patterns change - for instance that their regular basket of purchases downgrades, that they buy lower-quality products - then we can start to get a preemptive understanding of how vulnerable people are or what level of stress they are under.”

Daniel Sullivan, the city’s Director of Risk and Resilience

The city also has plans to overlay anonymized, aggregated data on payments made by residents for various city services, to provide a more comprehensive picture of economic resilience across the city.

Challenges

- High level of informality in both housing and business sectors
- Gaps in municipal data infrastructure
- Challenges related to data protection and privacy, both individual and corporate

Key Outcomes

- Increased visibility into community wellbeing metrics in real time
- Enhanced capacity to direct resources and bolster response capacity during crises
- Trust-building among city departments and between the city and communities



PART 3: BARRIERS TO ADOPTION AND WAYS FORWARD

KEY MESSAGES



Public financial technologies can enhance city resilience, though adoption remains limited by key barriers. Innovation must also be pursued with a constant focus on ensuring the security and privacy of residents' information and data.

Organizational silos within city governments create a divide, where digital and resilience teams operate without sufficient collaboration. This issue is highlighted by the lack of a unified mandate among digital teams to address key resilience issues, and by city resilience teams' limited involvement in digital projects.



Knowledge gaps further hinder the growth of public-purpose technology ecosystems, as cities struggle with identifying and engaging diverse suppliers and inclusive community involvement.

Infrastructure challenges are also notable, with many cities, especially in Low and Middle Income Countries, lacking the necessary digital infrastructure to support resilience-oriented innovations.





Regulatory frameworks often do not align with current technological needs, stifling public-purpose innovation by not accommodating new technologies and practices.

Additionally, **a culture of risk aversion** within city administrations discourages experimentation and innovative approaches, impacting the adoption of new solutions.



To overcome these barriers, we suggest a collective approach involving city government, residents, and the private sector, emphasizing targeted actions based on roles and responsibilities. We place particular emphasis on actions that teams and leaders within City Hall can take. These actions are designed to tackle multiple barriers simultaneously, potentially leading to significant improvements in the adoption and effectiveness of public financial technologies for city resilience.

BARRIERS

Cities that Thrive demonstrates the opportunities for public financial technologies to bolster many types of city resilience. Despite this potential, the use of these technologies remains nascent, and there are clear barriers to their adoption and implementation.

Our survey and interview research make clear that city governments face five key barriers to adopting public financial technologies to support city resilience efforts:

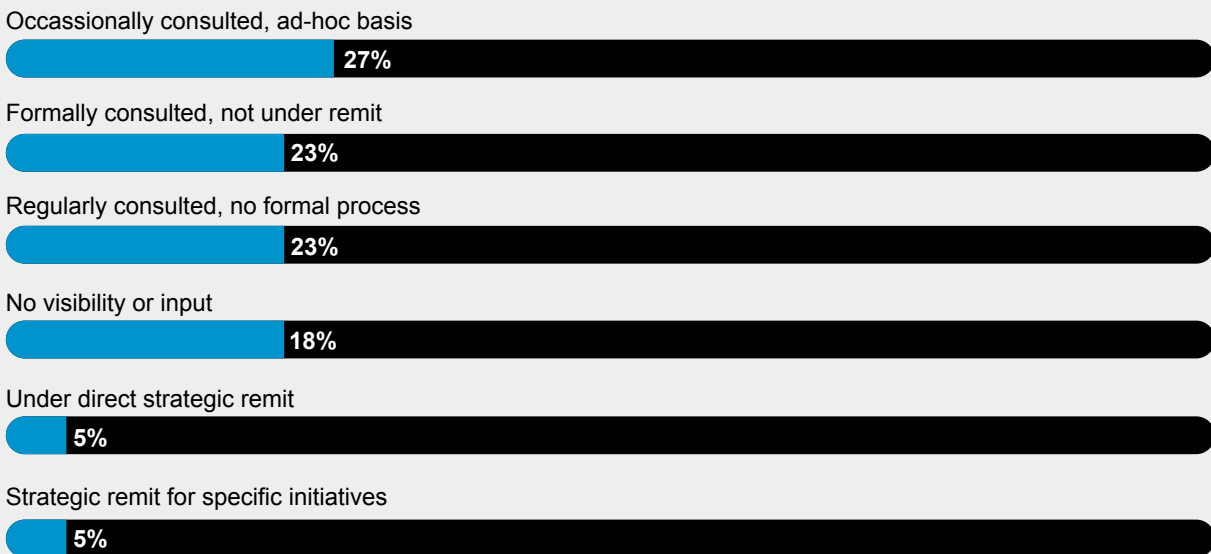
1. Organization: A digital-resilience divide within municipal governments

City digital and resilience teams typically sit in different government departments, can lack awareness of each other's work, and often do not have clear ways to collaborate even when they would like to work more closely. 53% of cities surveyed cited organizational silos as a key barrier in preventing the development and implementation of resilience-focused digital initiatives.

Both city resilience and digital teams independently identified this organizational barrier. **Most digital teams that we surveyed reported no mandate to work on solutions to support social equity, economic opportunity, water security, food security, and resilience to natural hazards. For their part, 45% of city resilience teams said they had no visibility or input into digital projects**, or were only occasionally consulted. In our interview research, city resilience and digital teams reported divisions in organizational structure, including unaligned strategy and budgeting, as hindering collaboration.

As a result of this divide, cities are failing to harness the full potential of digital solutions to address pressing resilience challenges, leaving significant gaps in their capacity to respond to, and recover from, shocks and stresses.

FIGURE 13: How Resilience Offices are engaged as part of city digital strategies and initiatives



2. Knowledge: City public-purpose innovation ecosystems are still emerging and knowledge gaps thwart their development

In many cities, public-purpose technology ecosystems are not yet developed and in some cases lack key stakeholders that would enable the open flows of knowledge, ideas, and transactions between the different groups and individuals that comprise them.

City governments often struggle to identify a diverse range of suppliers with whom to work.¹ Suppliers, in turn, can find procurement processes inscrutable and decisionmakers inaccessible, leading to avoidance of the city government market.² Local people and communities often continue to feel excluded from contributing to the ecosystem, whether to share their needs or suggest solutions.³

3. Infrastructure: Current digital infrastructures and resources allocated to support them do not allow cities to meet their resilience goals

Digital financial innovation is contingent on a set of supportive infrastructure, from good internet connectivity to foundational digital government platforms. For many cities, particularly in Low and Middle Income Countries, this infrastructure is missing. Other cities are dependent on legacy infrastructure that can no longer support the types of innovations and platform-based approaches required to unleash digital financial innovation. 63% of survey respondents indicated that a lack of financial resources or difficulty identifying external partners as one of their most significant barriers to deploying digital infrastructure for resilience. Increasing financial pressures often constrain the extent to which cities develop, invest in, and maintain digital infrastructures.

4. Regulation: Missing or unsuited governance and regulation to encourage public-purpose Innovation

Cities aiming to foster public-purpose innovation frequently encounter regulatory frameworks and governance arrangements that are misaligned with the current technological landscape. 80% of survey respondents identified procurement processes or legal frameworks as one of the top five barriers they face in integrating digital solutions to meet resilience goals.

This disconnect results in a regulatory environment that stifles innovation. To cultivate an ecosystem where public-purpose innovation thrives, while also ensuring the security and privacy of residents' information and data, cities need policies and regulations that better support and leverage innovations - in both technologies and ways of working - and allow successful pilots to scale into broader applications.

5. Culture: Institutional cultures

83% of survey respondents identified a culture or risk aversion and institutional habits, hierarchical decision-making or established 'ways of working' as one of the top five barriers to engaging digital innovation to meet resilience goals. This finding tracks with broader research into cultural norms and change within public sector organizations.⁴ Cultures within city administrations can disincentivize experimentation and new ways of working. There can be a fear of public perceptions of failure when experimenting, lowering risk appetites across teams and within city leadership. Teams who seek to serve vulnerable populations can hold concerns that experimentation will destabilize current service delivery, however imperfect a current service is, or cause harmful interruptions to local communities. There can also be divergent organizational cultures between innovators outside government and staff within city hall, for example, with different expectations surrounding timelines to action. All of these cultural factors can present challenges to fully embracing the possibilities of public-purpose innovation to achieve resilience goals.

¹ Filer, T 2021. 'How governments can turn procurement into a climate innovation tool'. Brookings. <https://www.brookings.edu/articles/how-governments-can-turn-procurement-into-a-climate-innovation-tool/>

² Ibid.

³ CitizenLab 2024. *Using Community Engagement to Co-Create Mobility Plans*. <https://www.citizenlab.co/ebooks-en/using-community-engagement-to-co-create-mobility-plans>.

⁴ Filer, T 2019. *Thinking about GovTech: A brief guide for policymakers*. Bennett Institute for Public Policy.

THE PATH FORWARD: TARGETED ACTIONS TO UNLOCK CITY RESILIENCE

Our proposed path forward outlines key actions that can be taken to lift barriers to public financial innovation, based on our findings and on industry knowledge. We consider which groups and individuals are best placed to lead on each action, based on their roles, responsibilities, and the levers that they have available, and we identify the level at which each action will have initial impact. These ideas are intended to provide inspiration from which cities can embrace the opportunities that public financial technologies present for resilience. They will necessarily take different forms in practice depending on many factors, such as the size, demographics, levels of digital connectivity, and resilience risks of individual cities. While there are many actions that can help to achieve positive change, we focus here on individual actions that hold the potential to have outsized impacts, often through tackling more than one barrier.

While stakeholders inside and beyond City Hall have important roles to play, our recommendations make clear, in particular, the role of urban resilience teams and city leadership. City leaders are already highly supportive of resilience initiatives, understanding it as core to their work. 85% of cities who responded to the 2023 R-Cities CRO survey¹ noted that their city leaders are engaged in the advancement of the resilience agenda. These actions equip CROs and city leaders with a joint roadmap to further the engagement of all stakeholders towards the enhancement of resilience for the city and beyond.

Barriers overview



1. Organization: Silos and fragmentation often prevail within city government



2. Knowledge: City public-purpose technology ecosystems are still emerging



3. Infrastructure: Financial and resource stress constrains the capacity of cities to meet their resilience needs and goals



4. Regulation: Missing or unsuited governance and regulation impedes public-purpose innovation



5. Culture: Institutional cultures prevent experimentation

¹ *Cities that Thrive survey data (2024).*

Level of Action: City Hall

Assess the city's current digital financial infrastructure to map gaps and needs, as a basis from which to create a roadmap for resilience-focused public financial innovation.

Example: Adapt Digital-Readiness Assessment (DRA) methodologies for public financial technologies.

Key stakeholder(s) responsible:



City and financial leadership

Primary barriers addressed:



Infrastructure

Identify and establish mechanisms to align digital and resilience-focused priorities and incentives, including through digital and resilience strategies.

Example: City leadership working with resilience and digital teams to identify and advocate for opportunities and mechanisms for increased efficiencies and joined-up ways of working based on aligned digital and resilience priorities and incentives.

Key stakeholder(s) responsible:



City leadership

Primary barriers addressed:



Infrastructure



Organization



Culture

Establish or expand the remit of city data and digital teams, to formalize ways of working with city resilience teams.

Example: Establish a 'surge' data & digital profession that is able to provide strategic advice to resilient teams on a regular basis / on particular initiatives.

Key stakeholder(s) responsible:



City leadership



City digital team

Primary barriers addressed:



Organization



Culture

Collaborate with Measurement, Evaluation, and Learning (MEL) and behavior change colleagues to design ways to experiment, measure, and evaluate the resilience outcomes of digital projects. This can enable a culture of responsible experimentation, where trying new approaches leads to learning and improved decision making.

Examples: Set up regular opportunities to share early results across government and with the broader ecosystem to enable learning and improvement; Create open datasets based on project results; Embed resilience measures into other performance measures (i.e. budgeting).

Key stakeholder(s) responsible:



City resilience team



City digital team

Primary barriers addressed:



Organization



Culture

Identify data and digital capabilities' needs within the city resilience team, in close partnership with other departments, to inform resilience planning and implementation.

Example: Invite colleagues from digital and data teams to co-map team challenges for which additional digital and data literacy is required.

Key stakeholder(s) responsible:



City resilience team

Primary barriers addressed:



Organization

Promote a clear, innovation-friendly governance and regulation framework, enabling a fair, competitive marketplace that can produce necessary innovations.

Example: Map emerging technologies, including public financial innovations, for which regulation does not currently provide; invite innovators to discuss potential regulatory challenges and blind spots.

Key stakeholder(s) responsible:



City leadership

Primary barriers addressed:



Regulation



Organization

Evaluate adoption of a single, secure online digital platform that can serve as a hub for all payments to and from the government.

Key stakeholder(s) responsible:



City leadership



City digital team

Primary barriers addressed:



Infrastructure

Tender resilience challenges, rather than prescribed solutions.

Example: Identify and define targeted resilience problems for which a challenge-based procurement method can help identify and unlock new public financial innovations - rather than procuring a fixed solution.

Key stakeholder(s) responsible:



City resilience team

Primary barriers addressed:



Regulation



Organization

Level of Action: City

Create conditions for trust and communications between ecosystem stakeholders through nurturing and catalyzing specific opportunities for ecosystem stakeholders to gather, trade, collaborate, critique, share ideas, and create a common language.

Example: Host or co-host Meetups; community-government co-design workshops, early-market engagement events before procurement processes.

Key stakeholder(s) responsible:



City leadership

Primary barriers addressed:



Organization



Culture

Collaborate across government, and with vendors, infrastructure operators, and other governmental entities to create unified standards and strengthen data security to ensure that digital devices and services across the city or region can seamlessly connect and operate together, with guardrails in place.

Example: Collaborate at a regional level on AI standards.

Key stakeholder(s) responsible:



City digital team

Primary barriers addressed:



Infrastructure



Regulation

Map the current local ecosystem and supply chain to understand what public financial technologies are currently available and which partners to collaborate with.

Examples: Host local engagement events to discuss city challenges; Engage curated data sources that identify the public financial technologies landscape.

Key stakeholder(s) responsible:



City leadership



City digital team

Primary barriers addressed:



Infrastructure



Regulation

Level of Action: Regional, National and International

Ensure cities are equipped with the resources, data, and skills for place-based decision-making to enhance local resilience, including for digital initiatives.

Examples: Offer revenue-raising support to generate funds for initiatives; facilitate access to data-driven decision-making tools.

Key stakeholder(s) responsible:



Regional and national governments

Primary barriers addressed:



Infrastructure

Establish or join peer-to-peer networks for knowledge exchange and idea sharing.

Networks of different levels (regional, national, international) can provide efficiency around learning and capability development activities, and provide a nexus to fork projects and code, adapt ideas, and generate new ones.

Examples: Formal and informal networks with other cities and private-sector partners; communities of practice.

Key stakeholder(s) responsible:



City resilience team

Primary barriers addressed:



Organization



Culture



Knowledge

“Seeing where the ‘fast leaders’ have implemented solutions is useful when you are positioned to be a ‘fast follower’”

City Official



CONCLUSION_

Cities that Thrive started from the premise of listening to teams in City Hall to understand their needs and the ways in which they are seeking to serve their local communities. We learned that in an era defined by climate change, rapid urbanization, and digital transformations, cities around the globe face mounting resilience challenges.

As urban populations grow, the imperative for robust innovations is urgent. Central to enhancing urban resilience is the strategic embrace of digital tools and technologies, which have the potential to make urban governance better and easier for people and the planet.

Public financial technologies stand out as important resources. These technologies not only foster governmental operational efficiency and enhance service delivery, but also promote inclusivity and can serve as vehicles for supporting important resilience goals, such as social equity and climate-change mitigation and adaptation. With the necessary standards and guardrails in place, they can help to bridge critical gaps between potential and practice in advancing resilience-focused initiatives.

Cities are starting to find innovative ways to adopt public financial technologies and overcome adoption barriers. Success stories reveal a common theme: action should be collective, involving members from across the public financial ecosystem, including city government, residents, and the private sector.

The ecosystem-based approach proposed in *Cities that Thrive* can help to create a path that sets a foundation for thriving, sustainable urban futures.



VISA



StateUp