



FEATURE

## Future-proofing cities in a post-pandemic world

### Four capabilities to build resiliency in cities

By Miguel Eiras Antunes, Mahesh Kelkar, Sushumna Agarwal



## A lesson in resiliency during the COVID-19 pandemic

In September 2020, when most of the world was grappling with COVID-19, life in Singapore seemed almost normal. Not only were businesses, workplaces, restaurants, and other public places fully open, limited air travel was also permitted. How was this possible when most countries were caught off-guard in dealing with a crisis that hit them out of nowhere? Turns out, much of it can be attributed to the implementation of the SG Clean initiative that required individuals and businesses to follow a set of good hygiene habits and rules.

Singapore was prepared. The SG Clean initiative wasn't a knee-jerk reaction to the COVID-19 pandemic. Its implementation can be traced all the way back to the systems put in place after 2009 H1N1 outbreaks. First, after the H1N1 outbreak, the government launched the Public Health Preparedness Clinic initiative (PHPC). The PHPC is a network of more than 900 clinics that help provide a consolidated primary care response in public health emergencies, such as the COVID-19 pandemic. In the early days of the pandemic, these clinics provided subsidized care to more than 70% of patients who had contracted the novel coronavirus within the first two days of the onset of symptoms.

Second, in 2014, the Ministry of Health in Singapore implemented the PPE national stockpile and rotation system. The public health system maintained a 3-6 month of PPE stockpile, and vendors resupplied PPEs whenever the stockpile fell below the 90% baseline stock. These stockpiles came in handy during the COVID-19 surge as they ensured adequate PPE availability for health care and frontline workers. Third, Singapore's years of investments in technology and digital infrastructure paid dividends during the current pandemic. This digital backbone allowed the city-state to launch a series of citizen-centric apps and portals that helped them find masks, get financial support, identify crowded places to avoid, and get accurate information via government chatbots. Singapore was able to respond to COVID-19 better than most countries, states, and cities due to a primary focus over the years on building resiliency. It hadn't seen

COVID-19 coming in a crystal ball; it had the physical and digital systems in place for such types of disruptions. After more than a year of the COVID-19 pandemic, cities are still recovering and adapting to the new normal. As the focus shifts from managing the public health crisis to strengthening the public health system and reinvigorating economic recovery, cities should be building long-term resiliency.

This article focuses on how cities can build resiliency in public health systems, government operations, and other city domains by focusing on four key capabilities—nimbleness, scalability, stability, and optionality. Our recommendations are informed by a global survey of 167 cities conducted by Deloitte and ESI ThoughtLab to identify challenges and track progress made by cities in each of the key capabilities of resiliency.

## Resiliency no longer a buzzword; it's time for action

Resilience has been a popular term in the management lexicon for years. But its relevance has rarely been this important. In simple terms, the Organization for Economic Co-operation and Development defines resilience as a city or an urban center's ability to prepare for, respond to, recover, and adapt from a disruptive event.

Singapore's experience in responding to the pandemic provides some important lessons on resiliency. One, it takes years of concerted efforts to build resiliency; it is primarily a capacity-building exercise with a strong focus on areas with the biggest gaps. In Singapore's case, some of the initiatives that have paid off today were implemented and improved over a 20 year period. Two, the efforts should be at scale and cover all city functions and domains. Singapore purposefully built capacity in public health systems, IT infrastructure, supply chain, and more, to build resiliency.

Deloitte's upcoming book *The Transformation Myth* defines four key capabilities found in resilient organizations—nimbleness, scalability, stability, and optionality. These four capabilities can be used in the city context to understand the progress cities have made in evolving long-term resiliency (figure 1).

- **Nimbleness:** The way a city acts and reacts to situations with speed, decisiveness, and changes direction as the situation demands.
- **Scalability:** A city's ability to respond to an unanticipated, and sometimes exponential, increase or decrease in demand in a short period.
- **Stability:** A city's ability to remain firm in the present with its operations while also experimenting and scaling solutions for the future.
- **Optionality:** The way a city can augment its operations and services by tapping into a broader ecosystem of players, including the private sector, start-ups, technology companies, academia, and nonprofit organizations, and in turn, allowing it to be even more nimble, scalable, and stable.

## Mapping cities' progress on resiliency

The four capabilities of resilient cities, while not exhaustive, provide a framework that can work as a starting point for cities. These capabilities are not mutually exclusive; they overlap at times and complement each other.

Below, we discuss the challenges cities face in building long-term resiliency in the light of these capabilities and how they are addressing them based on the insights gleaned from the survey. (See sidebar, "About the survey" to know more about the survey.)

FIGURE 1.

### Four capabilities of resilient cities



Source: Deloitte analysis

### About the survey

ESI Thoughtlab, in collaboration with a coalition of business, government, and academic leaders, including Deloitte, surveyed 167 cities globally to understand their progress on UN Sustainable Development Goals, how they coped with the pandemic, and how they are leveraging digital technologies, data, and other innovative solutions to drive progress in the post pandemic era. The survey was conducted between August and November 2020. It covered cities across 82 countries with varying income levels and population sizes. The survey also classified cities into three stages of smart city maturity—beginner, intermediate, and leader—based on their progress in harnessing technology and data across various urban domains and their ability to foster citizen and stakeholder engagement. Based on the survey results, 29% of cities were classified as beginner, 49% as intermediate, and 22% as smart city leaders.

## Nimbleness

Nimbleness focuses on longer-term flexibility and intentional change-making within a city. Cities should embrace nimbleness across various domains, including IT, workforce, and governance, to ensure services are not disrupted whenever there are changes in the external environment.

One of the biggest challenges cities often face in being nimbler are their internal policies and procedures. Nearly 52% of surveyed cities cited complex policies, regulations, and procurement procedures as their biggest challenge in achieving their social, environmental, and economic goals. Interestingly, cities that are more advanced on the smart maturity curve feel it's an even bigger challenge than others, with 62% of smart city leaders surveyed calling it out as a challenge compared to 56% of intermediate and 39%

of beginners. This shows that as cities become smarter, it can become more difficult to navigate legacy internal procedures and rules, hindering nimbleness.

Cities have attempted to make their operations more agile by focusing on multiple areas like easing procurement processes, improving compliance procedures, and evolving a talent model that allows moving resources based on needs and tasks. One way to get there is creating a "just-in-time" civil service model wherein employees' work isn't confined to one department but instead enables them to move between projects and tasks based on their skillsets. Survey findings suggest that cities have not made much progress in this area, with only 18% of cities surveyed having shifted to such a model. However, nearly 30% of surveyed smart city leaders have developed such a model compared to only 6% of beginner cities (figure 2).

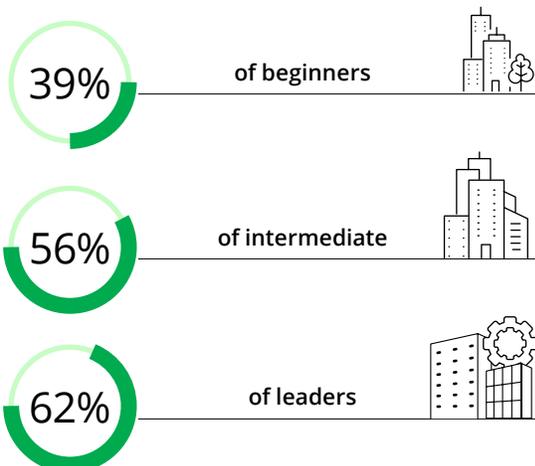
FIGURE 2.

## Challenges to nimbleness and progress on initiatives that could improve nimbleness

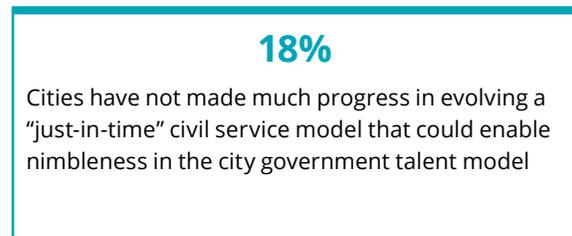
### Challenges to nimbleness



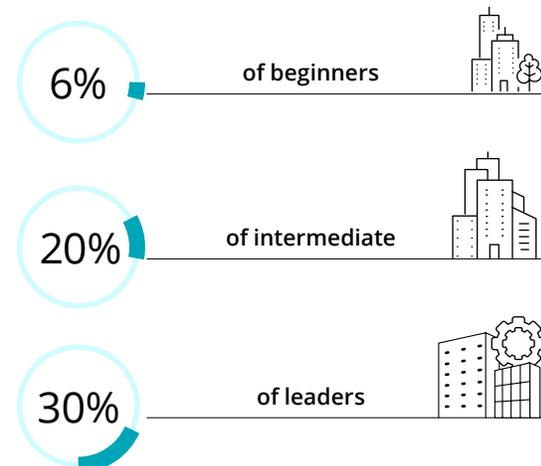
These internal processes and procedures become an even bigger challenge for more matured cities



### Cities addressing nimbleness



Cities more advanced on the smart city maturity curve are doing better than cities at lower maturity



Source: Smart city solutions for a riskier world survey 2021

## Scalability

COVID-19 was a tipping point for most organizations to shift to digital services and remote operations at scale—think telehealth, telework, or even virtual education. The pandemic elevated the status of digital from “nice to have” to “must-have.” As cities accelerate digitization efforts after the pandemic, having a scalable digital infrastructure becomes imperative.

In the last 20 years, cities have invested heavily in making their digital infrastructure and legacy systems more flexible and scalable. In fact, only 15% of cities surveyed chose digital infrastructure and legacy systems as a challenge in achieving their smart city goals. However, inadequate digital infrastructure and inflexible legacy systems continue to be a challenge for almost a third of beginner cities and a fourth of the cities

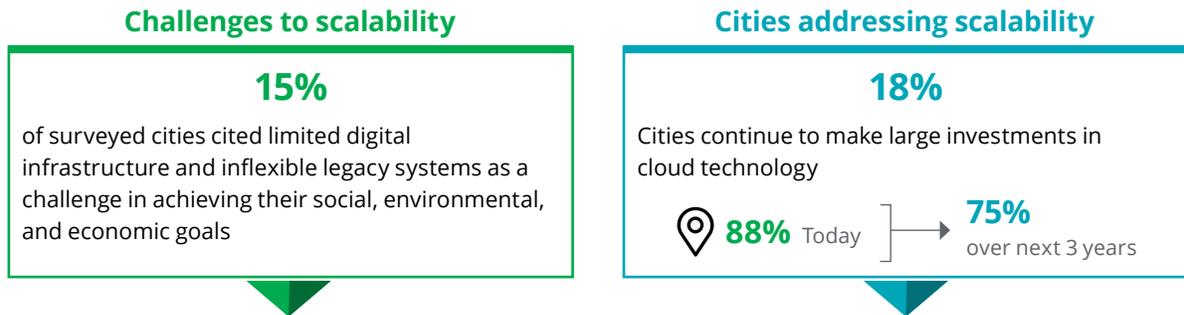
in emerging markets of Africa, Asia, and Latin America.

Cloud is the top digital technology investment, with nearly 88% of cities surveyed making large cloud infrastructure investments today. In the next three years, cloud is expected to continue to be a top technology investment area for cities. Here too, beginner cities are playing catch-up, with 69% of them making large investments in cloud technology today and almost three-fourths planning to make large investments in the next three years.

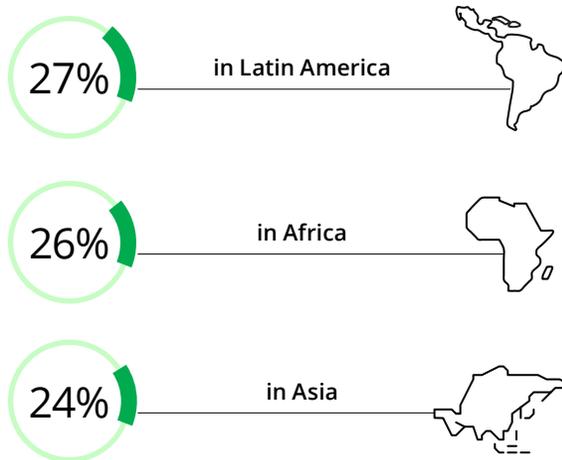
As cities focus on building scalable digital models, many of those surveyed are making large technology investments in areas that can enable digital payments systems (84%), process automation (78%), and digital services and experiences for constituents (56%) (figure 3).

FIGURE 3.

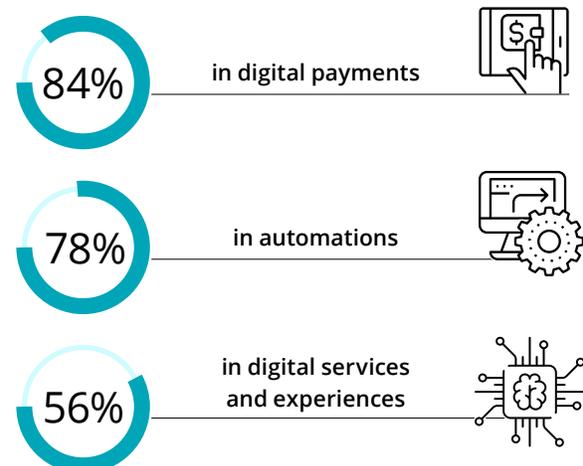
## Challenges to scalability and progress on initiatives that could improve scalability



However, the challenge is more prominent in emerging markets with nearly a fourth of cities calling it out as a challenge



Big technology investments by cities to enable scalable infrastructure and services



Source: Smart city solutions for a riskier world survey 2021

## Stability

Stability refers to a city working in two gears at once: ensuring that the city is on a firm footing right now while also working on the transformations and innovations needed to build resiliency for the future. To achieve this, cities will have to divide their resources, managing existing operations while also exploring and investing in ways to improve future responses.

One of the biggest problem areas cited by cities is the lack of timely access to data and advanced analytics to drive city operations. Nearly 40% of cities in the survey have identified this as a big lesson they've learned from the pandemic.

By investing in technologies such as data analytics, artificial intelligence (AI), machine learning, and scenario planning and simulations, cities can build "anticipatory" capabilities. These can allow city officials to target likely problems before they erupt and shift the focus from cleaning up problems to preventing them. Also, they can enable cities to quickly reassess their resource allocations and shift resources per

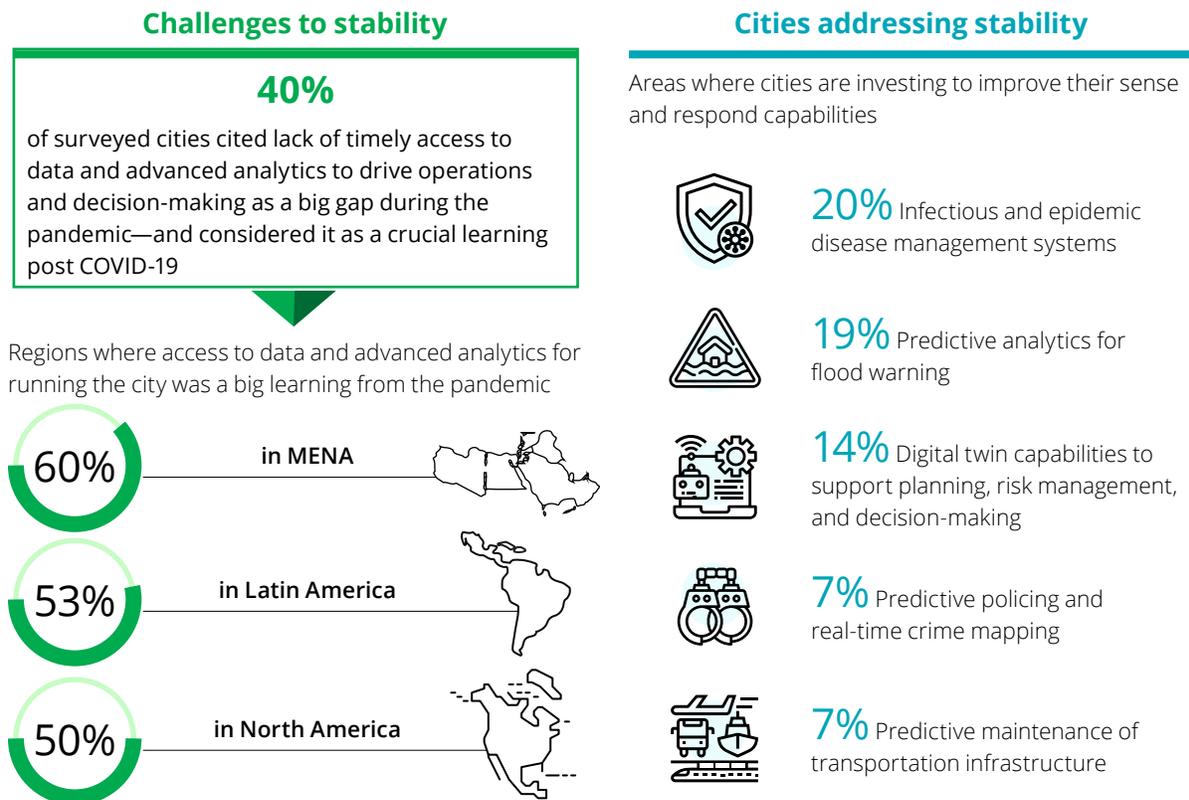
requirements, thus enabling a more nimble and scalable response to disruptions.

The progress on this capability can be tracked through investments cities are making in technologies that can enable them to respond better. Survey findings indicate that more and more cities plan to invest in such technologies over the next three years. However, the application of these technologies shows where cities plan to build out these capabilities. (Figure 4).

For example, the city of Porto in Portugal uses a digital twin technology called H2Porto to improve water management. It combines data from multiple sources, including geospatial information systems, network sensors, and house meters. This gives the city the ability to predict flooding and other water-related problems. The technology also allows the city government to manage its water systems in real time and share important updates with citizens, such as service interruptions or maintenance activities. It has enabled the city to reduce water service interruptions by 23%, and sewer collapses by 54%, thereby reducing operating costs.

FIGURE 4.

## Challenges to stability and progress on initiatives that could improve stability



## Optionality

Optionality focuses on how cities can augment their capabilities by collaborating with other organizations. During the COVID-19 crisis, cities tapped into a broad network of players to accelerate the availability of COVID-19 testing kits and ventilators, deliver essential goods to citizens, and scale their services rapidly.

However, building such an ecosystem of partners and problem-solvers can be an arduous task for cities. In the survey, about 50% of cities stated that finding the right suppliers, partners, and consultants was one of the biggest challenges in achieving their smart city goals.

Survey findings indicate that collaborating with the national government or regional agencies remains a top priority for cities. However, nearly 50% of surveyed cities plan to prioritize partnerships with start-ups, consultants, and multilateral organizations (figure 5).

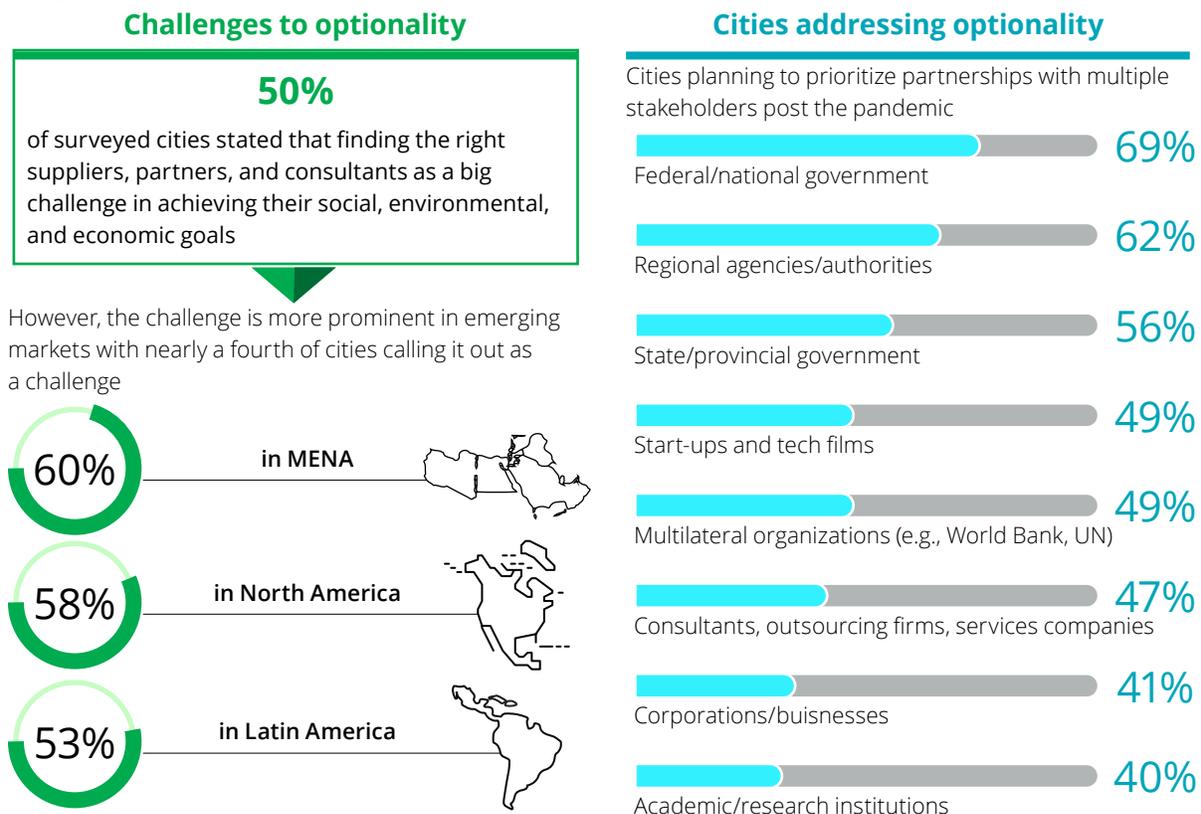
Working with such a diverse set of ecosystem players will require most cities to change their traditional approach to partnerships. It requires governments to

take a more proactive approach to building ecosystems and play multiple roles, including that of conveners, enablers, motivators, and integrators. This needs a new set of skills in the civil service and city leaders acknowledge the need to develop such skillsets in the government. About 44% of city leaders surveyed said they want to develop skills, capabilities, and the culture to work more effectively with external ecosystem players.

The COVID-19 crisis saw such ecosystems emerge across the globe during the early days in the fight against the virus. For instance, the city of Bengaluru, India, worked closely with the Indian Institute of Science and other locally based organizations to set up the COVID-19 war room in a matter of days. These command-and-control centers provided the city with a single platform to bring together civil society members, local businesses, and others to collaborate on multiple activities. They focused on information dissemination and citizen outreach, contact tracing, managing local lockdowns, organizing doorstep delivery of essentials, providing support to vulnerable populations, and providing emergency services.

FIGURE 5.

## Challenges to optionality and progress on initiatives that could improve optionality



Source: Smart city solutions for a riskier world survey 2021

## Conclusion

Cities have an opportunity to learn from the COVID-19 crisis to build resiliency in their systems, operations, and infrastructure. Just like the COVID-19 pandemic, the next disruptive event could blindside many. But it will be unfortunate if our cities are not prepared for it. The four capabilities explored in this article could be crucial for cities to build resiliency, help withstand future shocks, and bounce back quickly.

## Endnotes

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