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Public infrastructure

A once-in-a-generation opportunity

Public infrastructure—particularly transportation agencies—have a once-in-a-generation opportunity

To drive urgently needed growth in the pandemic era, governments across the world are committing to big investments in public infrastructure.

Building future-proof public infrastructures

New levels of funding for these projects provide unique opportunities to propel agencies into the digital age, developing infrastructures that are resident-focused, secure, sustainable and resilient. The keys to success will be employing innovative technologies and processes, digital transformation and initiatives that make projects not only more affordable but more efficient in the long term.

To explore this opportunity, Accenture conducted a survey backed by in-depth interviews with experts around the world.

We asked 490 public infrastructure leaders about their predictions for investments and action in a post-pandemic environment.

Nearly 80% expected a spending increase, suggesting that public infrastructure agencies globally are targeting big—and in some cases; long-overdue—infrastructure investments. This reflects the findings of the World Economic Forum (WEF) 2019 Global Risk Report, which identified underdeveloped infrastructure as a prominent long-term risk.[1]

What's required for agencies to take full advantage of this once-in-a-generation investment opportunity and momentum?

First, a holistic approach. Next, agencies need to reimagine how data and digital tools can be used to leverage as much value as possible.

And finally, they also need to engage collaboratively in ecosystems that enable them to securely share data and mitigate risk.

Harnessing efficiency from opportunity

Infrastructure has historically been underfunded by governments. Now, the anticipated surge in investments and focus on this space presents a significant opportunity. And it's not one to be overlooked.

According to the World Economic Forum, by 2040 the world will face a US$15 trillion gap between the funds required to provide adequate global public infrastructure and the amount being invested.[2]

It's a projected shortfall being driven by multiple factors:

- **Cities and populations are growing.**
- **Public transportation users expect increasing levels of responsiveness and service.[3]**
- **Climate change and natural disasters are putting more strain on aging infrastructures.**
- **Cybersecurity threats are on the rise.**

There is some good news. Governments are aware of the strain and making sizable investments to drive change.

Australia is investing AUD110 billion in the government's infrastructure pipeline (e.g., road and rail, road safety, community infrastructure) over the next decade to make progress closing infrastructure gaps.[4] The US recently passed a US$1 trillion infrastructure bill.[5] However, these additional funds won't be enough to plug the historical deficit.

It's vital that agencies find the most effective ways to maximize the impact of any funding they do receive. The aim? To use this influx of funding to do much more than help "catch up" on overdue infrastructure projects.

Instead, there is an unmissable opportunity to reimagine public infrastructure for the future powered by digital tools, platforms and approaches that make projects more efficient, more citizen-friendly and more sustainable in the long term.

New challenges, competing priorities...

Public infrastructure agencies sit within a complex landscape. From regulatory limitations to data availability to securing funding, each agency faces a unique mix of issues. And since the sector is so multifaceted, there's no "off-the-shelf" end-to-end solution for managing projects. This may be one of the reasons why nearly two-thirds of infrastructure leaders haven't deployed new technologies (such as Cloud PaaS) in the past three years.

Against this backdrop, it's no surprise that stalled adoption and cost overruns are so commonplace.

One study found that 85% of construction projects across 20 different countries over a 70-year timeperiod experienced cost overrun to some extent, with an average overrun of 28%.[6]

41%

of public infrastructure leaders list regulatory & compliance as a top-three pain point for their most recently completed infrastructure project.

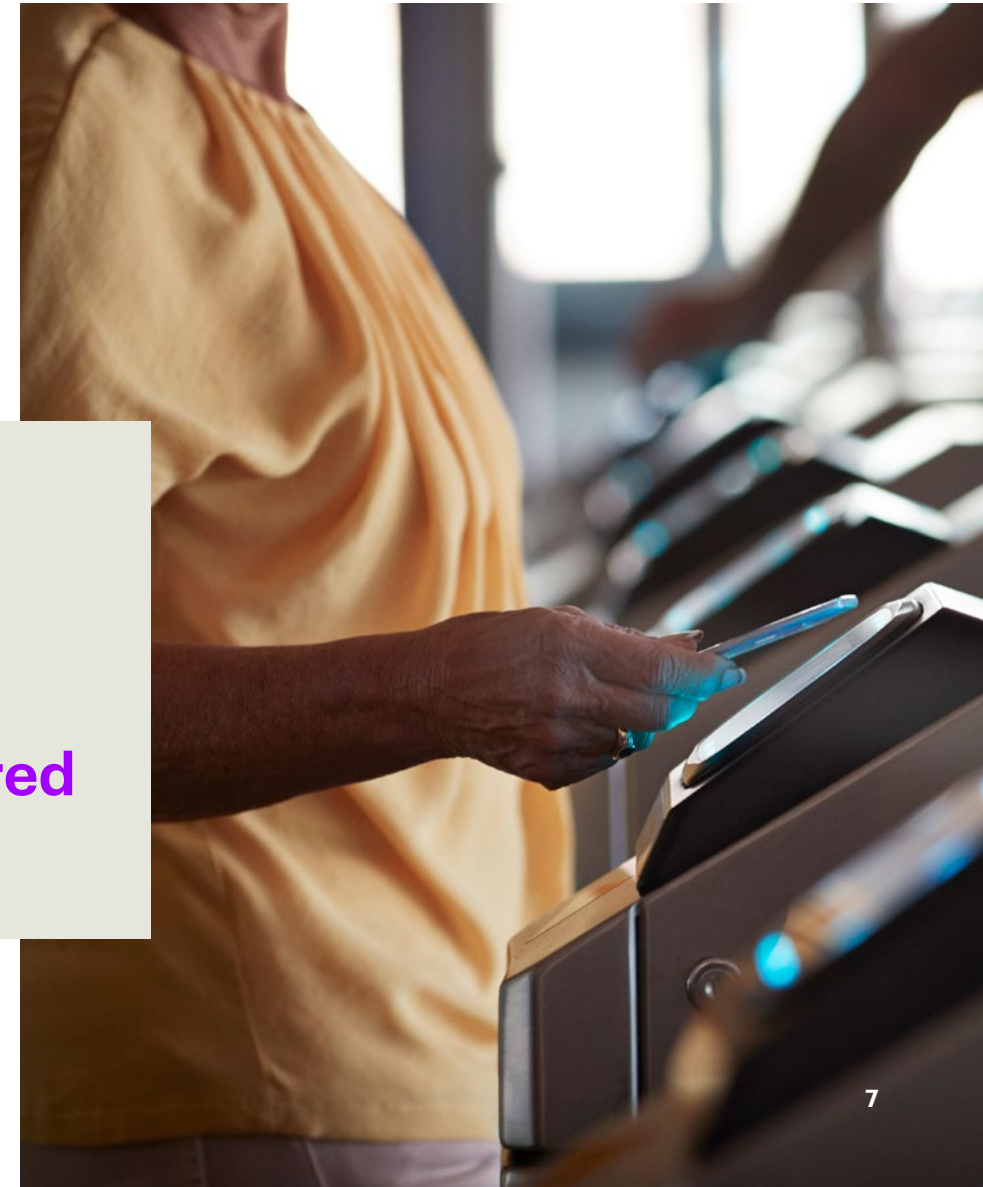
These are far from the only issues that infrastructure agencies must deal with.

Most of the public infrastructure professionals we talked to are planning to increase digital investment, there are several different investment strategies in scope. For instance, some agencies consider environmental, social and governance (ESG) goals to be main drivers behind digital investment decisions.

Less than half of public infrastructure agencies say that ESG considerations are a main driver behind digital investment decisions.

There are also big variations in how agencies are using technology and applications. Sometimes tasks are done manually because it's easier or because a tool hasn't yet been developed to carry out the task. Tools need to be adaptable to be effective at solving complex business issues.

Digital is a powerful multiplier. On average, investments in digital technologies deliver 6.7 times higher ROI compared to other investments.[7]



Moving forward: essential infrastructure investment

We're at a pivotal moment. As we emerge from the pandemic, there's a huge opportunity to decide what the future looks like and use this momentum to make it happen.

At the same time, agencies must seize the moment of reflection to act on sustainability. They should strive to make immediate, tangible infrastructure investments that will help support economic recovery from the pandemic but simultaneously make those moves a bold step towards a more sustainable future.

It's about turning bold visions into meaningful action that allows people, businesses and communities to thrive.

That’s why we believe that, however daunting it may seem, now is the right time to invest in digital platforms

Providing citizens with future-proof, sustainable and secure infrastructure

By adopting three key pillars, agencies can use the new influx of funding to create digital transformation momentum that fast-forwards progress to tomorrow's smart infrastructures:

Pillar 1

Develop a holistic strategy that balances short-term and long-term transformation

Have a 360° view that identifies current pain points while predicting future challenges and digital needs. The priority? Balancing "catch-up" projects with action on the long-term vision.

Pillar 2

Reimagine the role of data and digital in infrastructure

Anticipate and architect the future role of data in your organization. Assess the quality and availability of current data to identify gaps and necessary governance. Explore innovative uses of digital tools to deliver real results.

Pillar 3

Bring together ecosystem partners to maximize impact and minimize risk

Infrastructure projects bring together multiple players and considerations. Break down industry silos with a collaborative approach designed to deliver on the end-user's needs in the long term.

Pillar 1

Develop a holistic strategy that balances short-term and long-term transformation

Many public infrastructure services are long overdue for updates. And the queue of projects is only getting longer as physical assets age, populations grow, lifestyles evolve and the climate changes. With mounting pressure to update physical infrastructures, it may seem counterintuitive to allocate investments towards long-term digital transformation initiatives.

In fact by investing not just in the improvement of infrastructure itself, but also in project support and processes, agencies can make projects both more efficient and more accountable both in the short and long term.

Investment in digital transformation is investment toward a better, smarter future of infrastructure. In research for Accenture's 2021 Technology Vision,[8] 96% of city transport and mobility leaders said that their organizations' business and technology strategies are becoming inseparable—even indistinguishable. With such close linkage between the two, a holistic approach is needed to develop solutions that work for the business and for society in the long term.

The direction of change is clear. A staggering 85% of public infrastructure leaders say their organization considers ESG in its digital investment decisions.

The challenge from here is to develop a strategy that can balance current needs with what future requirements are predicted to be.

This might mean, for example, updating legacy systems and infrastructure while considering anticipated issues in connectivity and cybersecurity.

Metro de Madrid, for example, used a self-learning AI-based ventilation system that minimizes costs and keeps commuters cool.[9]

When agencies prioritize investments, they must consider not just cost, but also longer-term metrics spanning sustainability, security and efficiency, along with citizen experience.

New intelligent platforms can enable public infrastructure agencies to simultaneously address their top-three pain points across ongoing projects:

- **Regulatory & compliance**
- **Operations & maintenance**
- **Prioritizing projects**

"If you look at, say a construction contract...spending $10 million dollars a month...[its important] to have the digital tools in place to be able to understand the value from money that we're getting from that. They're delivering on the outcomes we want and that could be tools than can help us in our safety performance...
I think the information to help quickly inform decisions around what you're going to do—are you on track for what you set out to do—is pretty important."

– Infrastructure Leader (Australia)

We know that agencies typically have three or more projects on the go simultaneously.

Imagine the time and cost savings that would be realized if issues arising from these projects could be managed in synch, all from a single platform.

The Illinois Department of Transportation has developed a new data-driven decision tool to prioritize investments that deliver the greatest benefits.[10]

Our interviews identified scoping, procurement and project design as areas of high opportunity for digital investment. AI-based analytics could be used to prioritize projects and ensure compliance by simultaneously optimizing for cost and ESG metrics.

With a one-stop-shop for project data, project assessment and reporting would become both more transparent and more accurate. And real-time data could be used to identify and predict maintenance needs. As a result, projects would be more efficient, faster and, ultimately, more successful over the short- and long-term.

Pillar 2

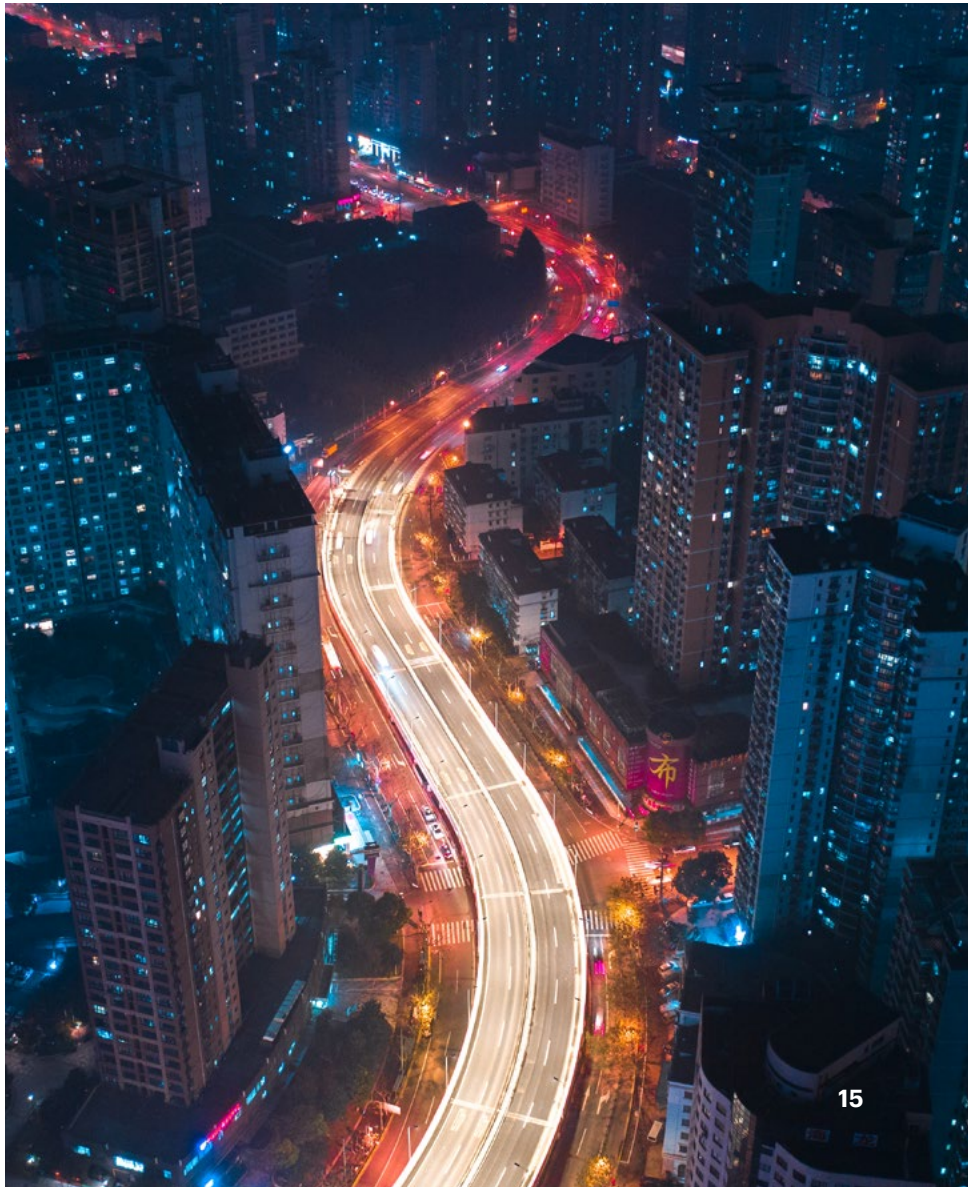
Reimagine the role of data and digital in infrastructure

Infrastructure agencies urgently need to identify innovative use cases for their existing data. Across all regions, companies are using data and analytics to achieve their business goals, from studying how automobiles will respond to incoming traffic data scenarios, to predicting human behavior in public transportation, to optimizing the location of CCTV cameras to reduce traffic accidents and improve road safety.

In spite of this progress, our survey found that, globally, in the past three years, 30% of public infrastructure agencies have deployed machine-learning solutions for project prioritization, selection and planning.

And despite the increased frequency of cyberattacks 19% have deployed machine-learning solutions for cybersecurity applications. Just one example of this trend: In December 2020 a Vancouver public transit agency was the victim of ransomware that rendered ticketing kiosks useless until the issue was resolved.[11]

As well as creating digital solutions and investing in platforms, agencies should consider their data flows, early and often. They must assess data availability and quality in the context of the agency's long-term vision.



Why is this so essential? In short, because data provides the digital fabric for future-proof, resilient infrastructure. The right data can improve project oversight, contract management and citizen experience. Digital solutions can enhance safety, optimize project schedules, enable transparent supply chains and provide insight into the sustainable performance of infrastructure throughout the full lifecycle.

1. Future mobility: A vehicle for innovation

Combining diverse expertise with Ottawa's telecom and cybersecurity strengths, Area X.0 fuels the creation, commercialization and adoption of breakthrough innovations in mobility, autonomy and connectivity. These applications span telecom, smart agriculture, defense, security, public safety, unmanned aerial vehicles and smart cities.[12]

2. CNH Industrial

CNH Industrial is creating connected vehicles that will provide customers with new services and functionalities in a variety of areas, including computer-aided farming, predictive maintenance, enhanced fleet management and green transportation. They also plan to develop a broad set of data-driven digital services to help clients drive sustainability, such as yield improvement in agriculture and more efficient vehicles and improved fleet management in the transportation industry.[13]

3. Free2Move eSolutions

In a Europe-wide, multi-year effort designed to accelerate sustainable mobility, Free2Move eSolutions is working toward the goal of helping to lead the transition toward electric mobility with a mission to solve complex issues and contribute to a more sustainable future.[14]

Of course, data-driven insights are only as helpful as the data behind them

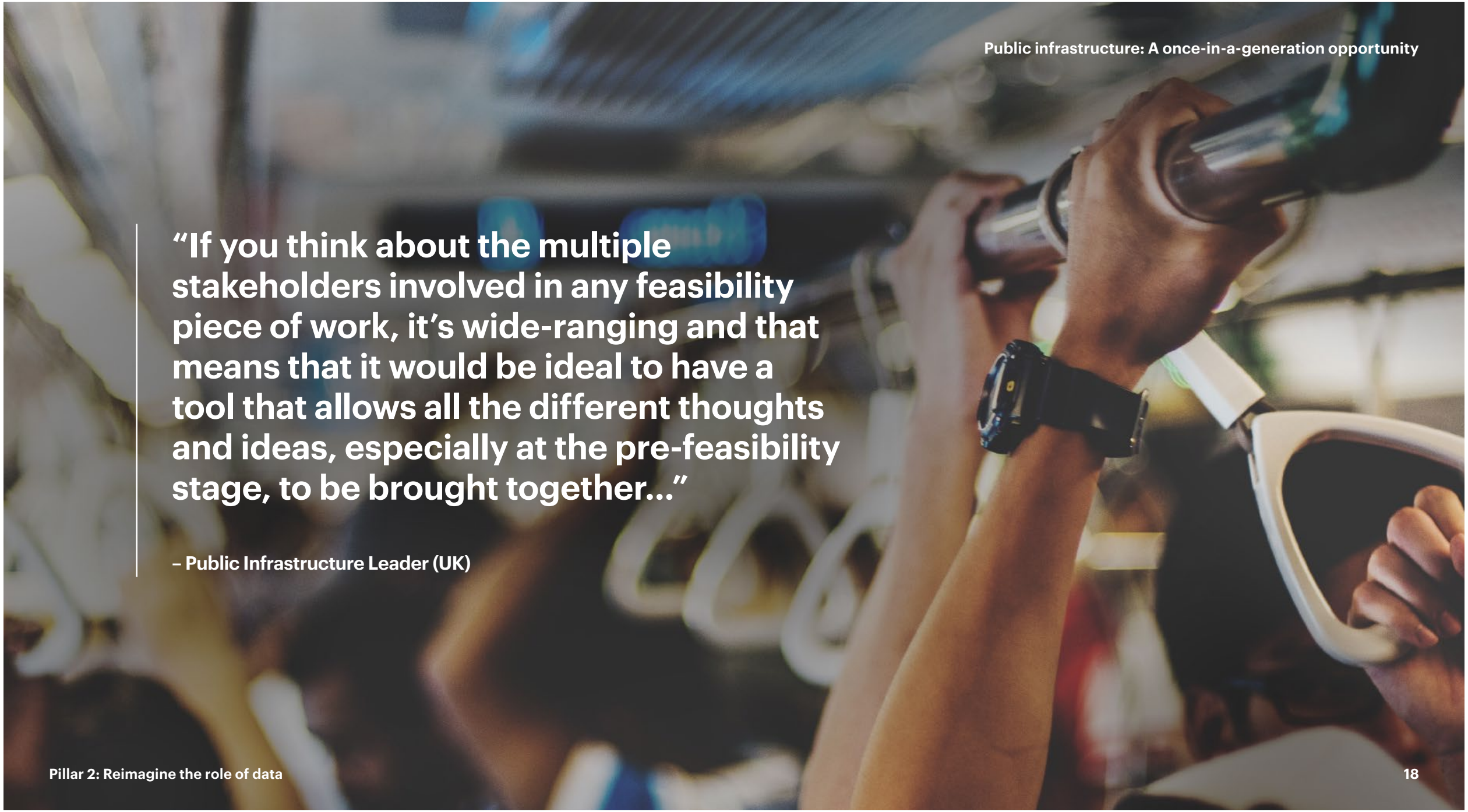
Nearly a quarter of survey respondents stated that poor data quality for operational insights was a primary challenge during recent infrastructure projects. Agencies particularly struggle to capture high-quality data on contractor performance and contract compliance.

38%

of public infrastructure leaders indicate that they collected good-quality data on contractor performance and contract compliance while digitally executing their most recent infrastructure project. Around half describe contractor performance and contract compliance data as "average" and around 12% characterize the data as "poor."

23%

of public infrastructure leaders cite poor data quality for generating critical operational insights as a key challenge to the digital element of recently completed infrastructure projects.



> "If you think about the multiple stakeholders involved in any feasibility piece of work, it's wide-ranging and that means that it would be ideal to have a tool that allows all the different thoughts and ideas, especially at the pre-feasibility stage, to be brought together..."
>
> – Public Infrastructure Leader (UK)

Pillar 3

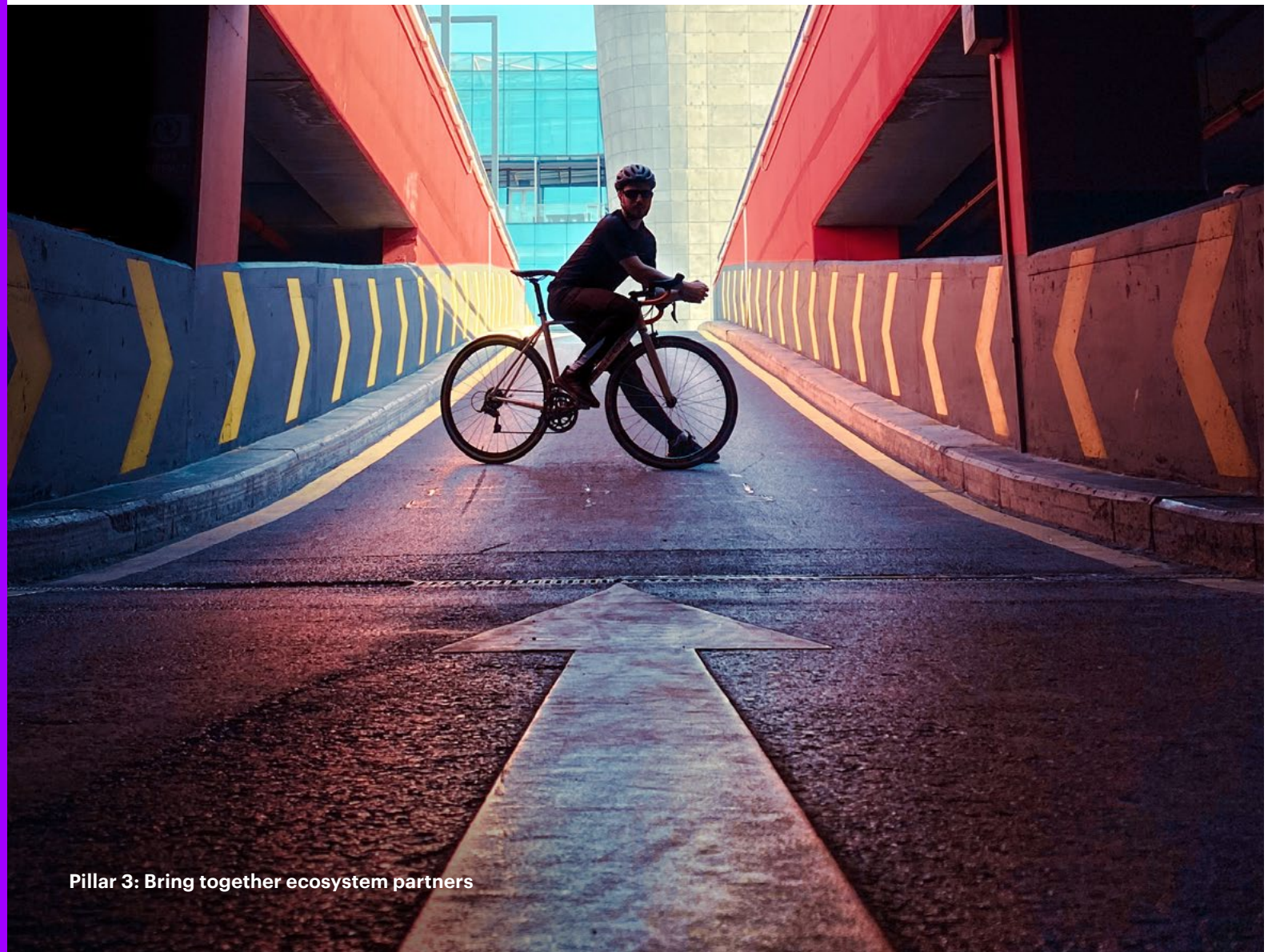
Bring together ecosystem partners to maximize impact and minimize risk

The best way to accelerate digital transformation is to break down silos and engage with a collaborative ecosystem. Agencies can avoid common pitfalls by partnering with organizations that have implemented similar solutions before. Access to knowledge, talent and data can make or break digital initiatives.

Within project teams, limited interest in and patience with data-driven digital transformation was a key trouble spot for survey respondents.

Key trouble spot for survey respondents—23% said this represented a major challenge during their most recent project.

More than 20% of respondents cited lack of quality data for drawing critical and operational insights as another primary challenge. Meanwhile, the absence of a strategy and skills to build and deploy actionable insights from digital technologies was a major challenge for 22% of respondents.

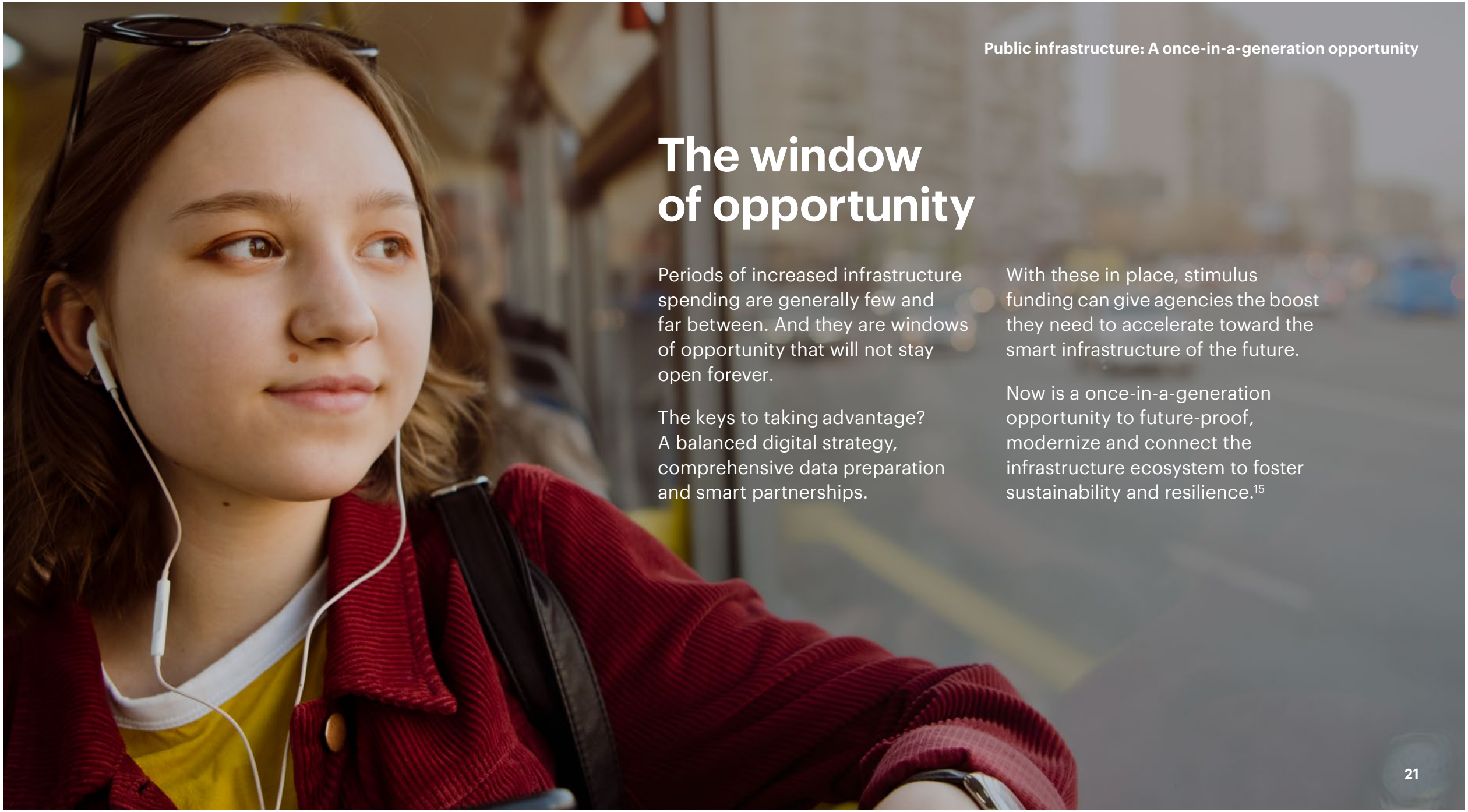


Pillar 3: Bring together ecosystem partners

Working alongside partners collaboratively allows the whole ecosystem to develop solutions in a fraction of the time it would otherwise take, while putting citizen needs and sustainability at the heart of all design decisions.

Ecosystems enabled by mutually beneficial data-sharing platorms improve collaboration between owners, contractors and suppliers, by helping them share information in a more timely and accurate manner.

Transparency and ongoing discussion ensure that solutions are not just flashy uses of cutting-edge technology. Instead, they are functional implementations that benefit both public infrastructure employees and citizens.



The window of opportunity

Periods of increased infrastructure spending are generally few and far between. And they are windows of opportunity that will not stay open forever.

The keys to taking advantage? A balanced digital strategy, comprehensive data preparation and smart partnerships.

With these in place, stimulus funding can give agencies the boost they need to accelerate toward the smart infrastructure of the future.

Now is a once-in-a-generation opportunity to future-proof, modernize and connect the infrastructure ecosystem to foster sustainability and resilience.[15]

About this research

Accenture Research surveyed 490 infrastructure leaders globally during June and July 2021. Respondents included leaders at the federal, provincial and municipal levels from seven different countries (Singapore, Australia, Canada, Japan, Spain, UK, US).

The survey sample predominantly came from the transportation sector, but also included some respondents from public buildings (excluding hospitals and schools), utilities, public works, etc.

To supplement these survey results, Accenture also conducted six interviews with agency leaders to gain more detailed insights into the challenges and outcomes of digitally enabled infrastructure projects.

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References

1 https://www.weforum.org/agenda/2019/01/infrastructure-around-the-world-failing-heres-how-to-make-it-more-resilient/

2 https://www.weforum.org/agenda/2019/04/infrastructure-gap-heres-how-to-solve-it/

3 https://www.accenture.com/us-en/insights/automotive/public-transit-rebuild-ridership-rebuilding-trust

4 https://www.accenture.com/us-en/insights/public-service/economic-growth-resilience

5 https://www.nytimes.com/2021/11/05/us/politics/house-infrastructure-reconciliation.html

6 http://www.ijimt.org/index.php?m=content&c=index&a=show&catid=83&id=1056

7 https://www.accenture.com/us-en/insights/public-service/economic-growth-resilience

8 https://www.accenture.com/us-en/insights/public-service/technology-trend-2021-public-service

9 https://www.accenture.com/gb-en/case-studies/industrial/metro-de-madrid?src=BADV&

10 https://www.metroplanning.org/news/10229/How-does-Illinois-decide-which-transportation-projects-to-invest-in-A-new-tool-will-help-IDOT-evaluate-projects-comprehensively?utm_source=Metropolitan+Planning+Council&utm_campaign=3a5326903a-2020+08+26+REG_COPY_01&utm_medium=email&utm_term=0_ff723d8fb6-3a5326903a-46479953&mc_cid=3a5326903a&mc_eid=207fd1b763

11 https://www.zdnet.com/article/ransomware-attack-cripples-vancouver-public-transportation-agency/

12 https://www.accenture.com/ca-en/case-studies/public-service/future-mobility-smart-cities

13 https://newsroom.accenture.com/news/cnh-industrial-accenture-and-microsoft-collaborate-to-develop-connected-industrial-vehicles.htm

14 https://newsroom.accenture.com/subjects/technology/free2move-esolutions-and-accenture-join-together-to-accelerate-energy-transition-towards-net-zero.htm

15 https://www.accenture.com/us-en/insights/public-service/economic-growth-resilience