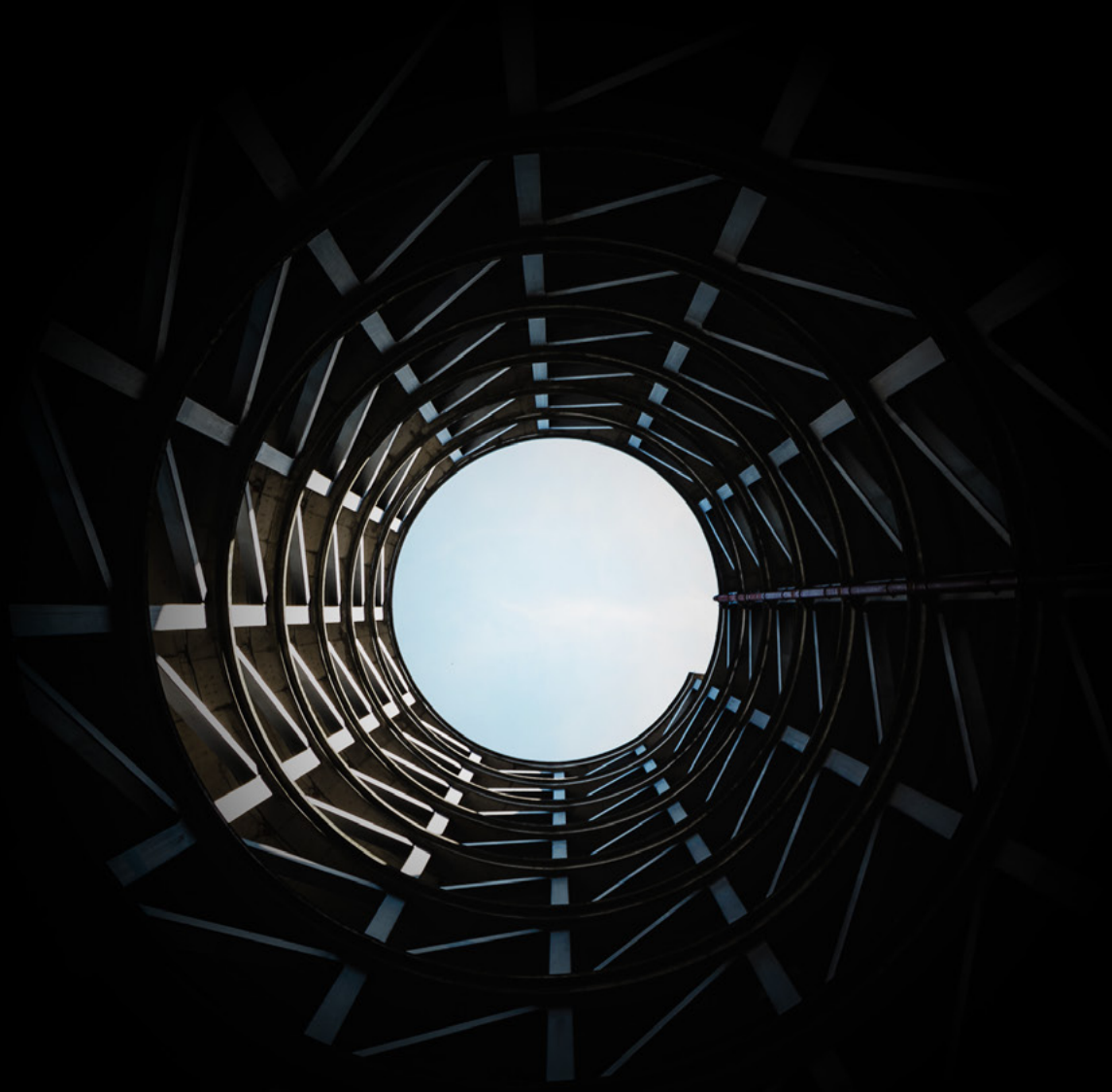


Ashurst

# Future Forces 2023:

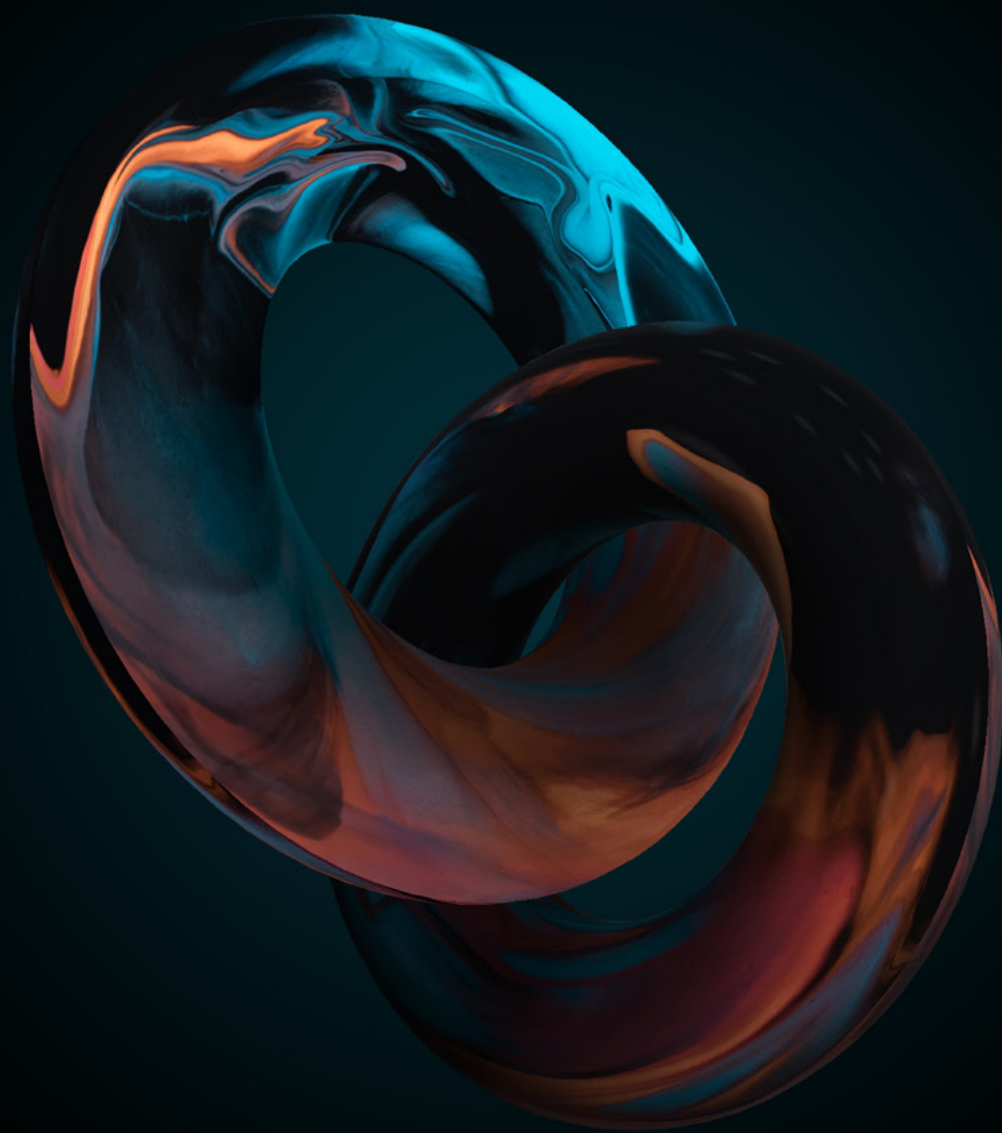
The megatrends shaping  
infrastructure businesses



Outpacing change

Based on research by

**ECONOMIST  
IMPACT**



# Key takeaways

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**Resilient cities:** meeting the needs for greener and smarter infrastructure in fast-changing cities is considered the top opportunity (48%) for infrastructure businesses in the survey.

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**Decarbonisation:** businesses in this sector see multiple opportunities from decarbonisation, including improving their attractiveness to customers (42%) and developing new products and services (37%).

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**Workforce:** infrastructure businesses will continue to face a talent crunch, with many (43%) citing difficulties meeting salary demands of skilled workforce in the next decade.

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**Technology:** advances such as artificial intelligence (AI) and augmented and virtual reality (AR and VR) will help address skills shortages and improve the sector's efficiency. While more than a third of businesses consider those the most attractive investment opportunities in technology, cybersecurity challenges will also need to be addressed.

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## Economic headwinds and geopolitical uncertainty notwithstanding, a sustained period ahead of infrastructure growth and innovation looks likely, thanks to a confluence of megatrends.

Worldwide efforts to transition to net zero carbon emissions, cities' and regions' needs for smart, energy-efficient infrastructure, and accelerated digitalisation will present growth opportunities for construction, transport and IT companies well into the future.

Workforce and skills challenges, however, could limit the ability of many organisations to pursue and benefit from those opportunities. Difficulties securing digital skills could, for example, compromise infrastructure providers' ability to harness advances in technology. But securing them, allied to investments in automation and artificial intelligence (AI), can help these businesses to achieve cost reductions and much-needed efficiency improvements.

In the flagship report of this programme, *Future Forces 2023 Report: The megatrends shaping business over the next decade*,<sup>1</sup> we explored the opportunities and challenges that six megatrends pose to businesses in the decade to come, presented in the table below. This article presents the key insights provided by executives from the infrastructure sector, including within the construction, supply chain, transport and digital spheres.

Megatrend	Implications for business
<b>Changing global dynamics</b>	Organisations must develop their risk management capabilities and build resilience to adapt to the growing frequency of political, macroeconomic, public health and other shocks
<b>Net zero transition</b>	Organisations will need to decarbonise their operations and mitigate their climate risk
<b>Digitalisation</b>	Businesses will fall behind if they fail to derive greater value, efficiency and convenience from technological innovation and the digitalisation of their products and services
<b>Demographic change</b>	Remaining competitive requires businesses to adapt their products and services to meet the needs of diverse groups of customers while accommodating workforce ageing, the younger generations' changing preferences
<b>Skills for the future</b>	Amid workforce ageing and continued shortfalls of critical skills, organisations will need to prioritise reskilling and upskilling to fill their gaps
<b>Resilient cities</b>	When cities become denser, more congested and increasingly affected by climate change, organisations can help them remain productive and able to cater to the community's diverse needs



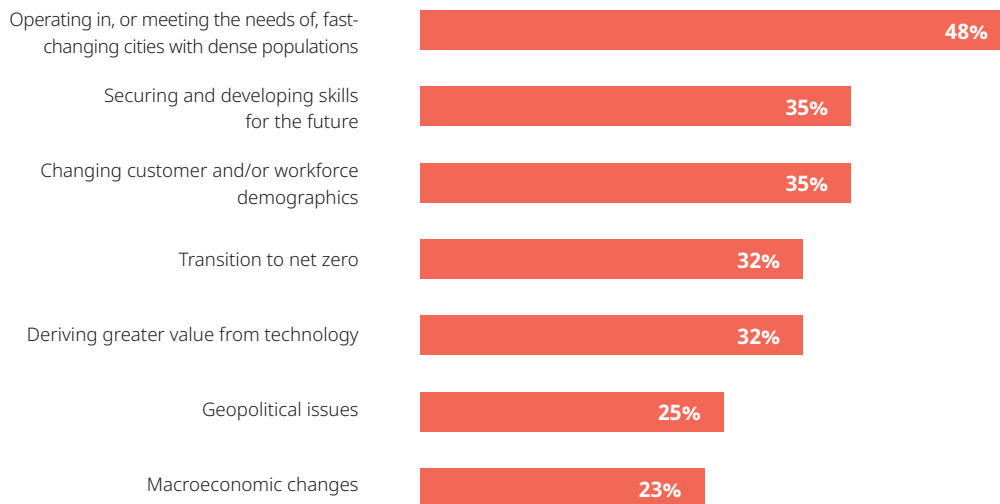
Worldwide efforts to transition to net zero carbon emissions, cities' and regions' needs for smart, energy-efficient infrastructure, and accelerated digitalisation will present growth opportunities for construction, transportation and IT companies well into the future.

# The modernisation agenda

Asked which of the six megatrends offer their businesses the most attractive opportunities in the decade ahead, almost half of our infrastructure respondents (48%) point to resilient cities. Ross Israel, Head of Global Infrastructure at Australia-based Queensland Investment Corporation agrees: “Resilience is the key word. Infrastructure providers must help cities and other entities build resilience into their energy, transport and communications networks to help them deal with climate change and transition to renewable energy sources.”


## Figure 1: Building resilience in cities

**The megatrends presenting the most attractive and realistic opportunities for infrastructure businesses in the decade ahead**



Source: Economist Impact survey

Accelerated digitalisation is integral to achieving these outcomes. Mr Israel provides the example of smart meters in homes that will increasingly incorporate artificial intelligence (AI). “Such technology will lead to the decentralisation of municipal grids, thus distributing power ownership and control to residents. This control will lead to greater energy- and cost-efficiency. It should also result in growing amounts of power being returned to the grid, and will help smooth the intermittency issues that currently exist with the use of renewables.”



“Resilience is the key word. Infrastructure providers must help cities and other entities build resilience into their energy, transport and communications networks to help them deal with climate change and transition to renewable energy sources.”

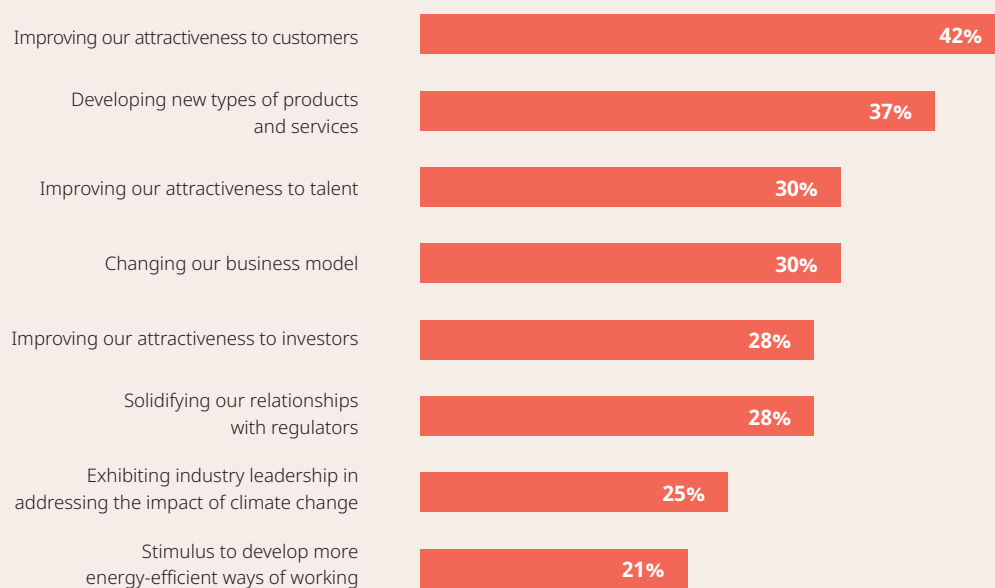
Ross Israel, Head of Global Infrastructure,  
Queensland Investment Corporation

Modernisation requirements differ between developed and developing-world cities, but Mr Israel sees the opportunities as equally attractive to infrastructure providers: "In developed cities, investment is focused on reducing the existing carbon footprint of infrastructure. This is driven by cities setting lofty net zero targets, for example, New York is aiming for carbon-free electricity by 2040. Achieving these targets in cities around the world would present difficult choices between upgrading existing vs building new infrastructure. For instance, new energy-efficiency standards for buildings in England and Wales could lead to 60% of offices becoming unusable by 2027.<sup>2</sup> Developing cities require similar solutions, but new infrastructure also needs to deliver a significant quality-of-life uplift to residents. If those needs are met, the outcomes will be net positive for all cities as well as for infrastructure providers."

Infrastructure businesses, like those in other industries, are under pressure from policymakers, regulators and shareholders to decarbonise their operations. And from doing so, many infrastructure respondents envision gaining a competitive advantage. For example, 42% believe such efforts will improve their standing with customers, while 37% believe that new types of products and services could be created. Examples of the latter in construction could include cement and concrete produced with low-carbon fuels. Infrastructure executives in our survey see opportunities in meeting the demand for transport infrastructure with smart roads and mobility solutions, which can ease congestion and limit or reduce carbon emissions. These could include AI-supported smart traffic-routing systems or IoT enabled vehicle-to-infrastructure systems that support autonomous vehicles.

## Figure 2: Many opportunities from decarbonisation

### Most attractive and realistic opportunities from pursuing net zero goals for infrastructure businesses



Source: Economist Impact survey



Infrastructure growth will go hand in hand with modernising processes. Global macroeconomic conditions, such as persistent inflationary pressures, as well as the net zero transition will continue to exert cost pressures on infrastructure businesses. Increased costs will be felt for years to come as the sector experiences project delays and cancellations, in turn deterring investors and impacting the infrastructure development pipeline.<sup>3</sup> However, the potential modernisation of financing for infrastructure has the scope to create new opportunities for the sector, including scaling up of climate resilient infrastructure. The financing processes for this could be modernised by streamlining public procurement processes, developing clear plans for investors and public private partnership contracts, integrating climate change risk screening into plans, and leveraging public finance and policies.<sup>4</sup>

In the next decade, the sector should look to decarbonise itself, provide the necessary climate infrastructure for other industries to decarbonise, streamline processes for cost savings, and leverage public finance to provide a positive social impact. One way of achieving these goals is to consider infrastructure as part of the broader ecosystem rather than in silos and leverage interlinkages between different sectors where possible.<sup>5</sup> For instance, adopting sustainable infrastructure can drive social good by creating jobs in the renewables sector.

## Harnessing digital

To meet the above needs, infrastructure products and services need to be digitalised. It is no surprise, then, that the top technology investment priorities among the surveyed infrastructure businesses are AI (35%) and AR and VR (37%). “AI is already playing an important role in reducing maintenance costs, moving us from time-based to condition-based maintenance, and it’s also helping to increase workforce safety,” says Mr Israel.

Going forward, buildings, materials and equipment will increasingly incorporate and eventually rely on Internet of Things (IoT) sensors<sup>6</sup>, which, with the help of AI, enable capabilities such as remote diagnostics and automated maintenance scheduling. The use of digital twins, a virtual model representing a physical object, supported by AR and VR will make faster and more accurate project design possible. Meanwhile, automating on-site processes such as brick or asphalt laying will reduce costs and relieve in-demand construction workers from laborious tasks (although automation is likely to displace humans from some construction roles in the future). Mr Israel also points out that AR and VR, including digital twins, are playing a growing role in the design and construction of physical assets. Such solutions are also being deployed to alter experiences during live events such as in the design of sports stadiums.<sup>7</sup>

“AI is already playing an important role in reducing maintenance costs, moving us from time-based to condition-based maintenance, and it’s also helping to increase workforce safety.”

Ross Israel, Head of Global Infrastructure, Queensland Investment Corporation

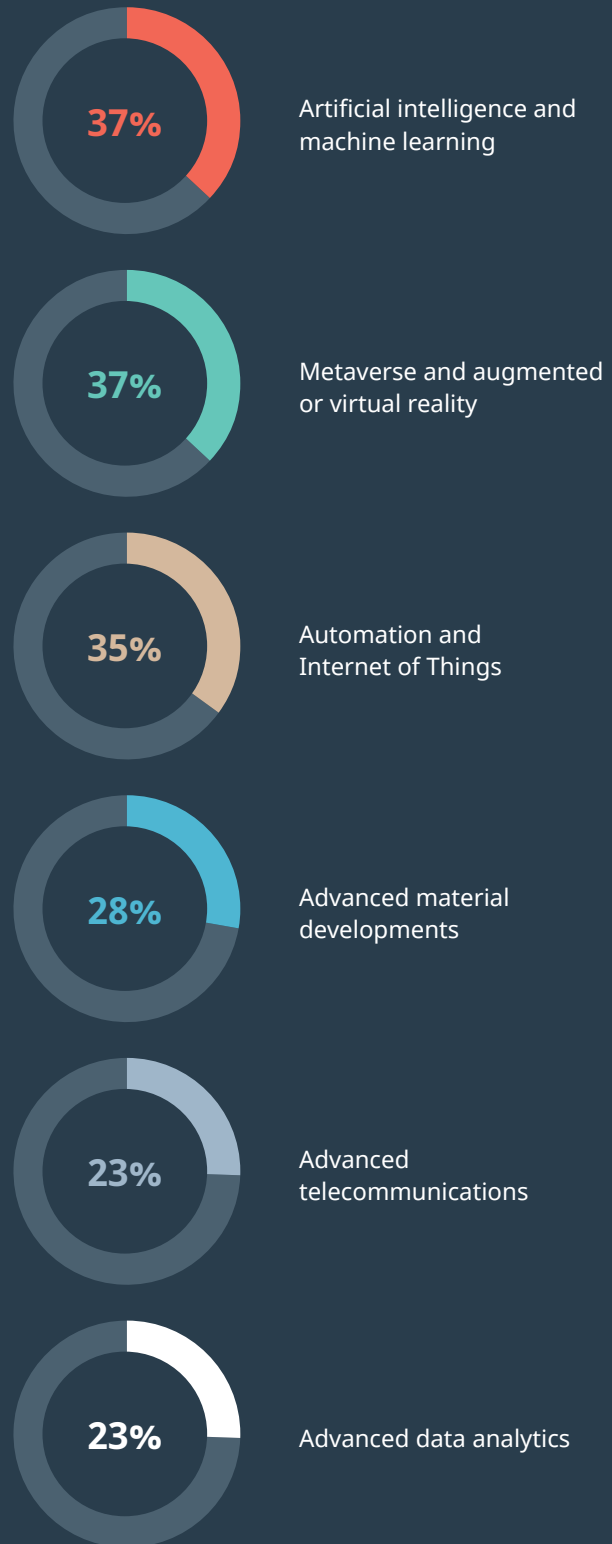
Similarly, the market developments that respondents expect to impact their businesses most heavily in the coming decade are further advances in the digitalisation of physical assets (38%), as well as advances in AI and related fields (33%).

Harnessing those assets will require meeting several challenges—and prime among these are cyberattacks. According to Microsoft, there was a sharp increase in cyberattacks on critical infrastructure by government entities in 2022, accounting for 40% of all cyber attacks, up from 20% in 2021.<sup>8</sup> This risk is likely to rise further, as organisations are projected to own over 41 billion IoT devices by 2025<sup>9</sup> (rising from 15bn at present<sup>10</sup>), providing an even larger surface area for attacks. In tandem, there is a severe shortfall of cybersecurity professionals, expected to reach 3.5 million by 2025, preventing the preparation of necessary defences.

Addressing the cybersecurity vulnerabilities that come with increasingly interconnected assets is a major challenge, as is acquiring or developing the skilled talent that can work with such technologies (see below). Another is customer education: “The industry needs to build awareness among customers about what these technologies can do for them,” says Mr Israel. “It’s only just begun to do this.”

### Figure 3: The big upgrade

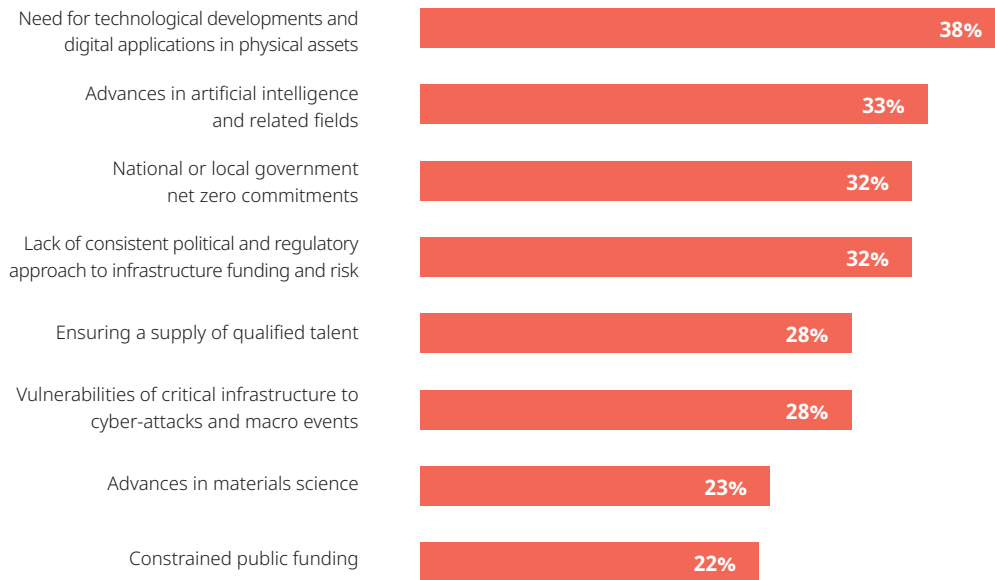
Technology investments likely to make the biggest positive difference to infrastructure respondents’ businesses in the next decade



Source: Economist Impact survey

## Figure 4: All eyes on digital

Share of infrastructure industry respondents citing the market developments likely to have the biggest impact on their business over the next decade



Source: Economist Impact survey



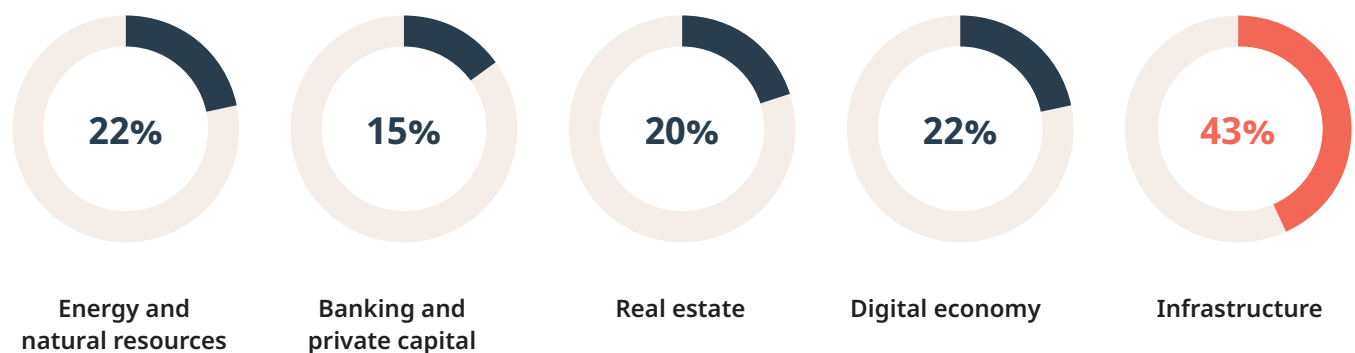
## Evolving workforce challenges

Many infrastructure businesses—particularly in the construction sector—struggle to replace engineers and other skilled staff who are retiring. In the US alone, 25,000 new civil engineers are needed every year in this decade. On top of this, new infrastructure investments are expected to create 883,600 jobs by 2030.<sup>11</sup> The same challenge is arising in developing countries like India, which has seen a decline of admissions into civil engineering education since 2019.<sup>12</sup> Their struggles are likely to persist, particularly as ongoing digitalisation increasingly requires workers with skills in different technology areas.

The talent crunch helps explain why infrastructure respondents see demographic change as posing especially tough challenges to their businesses over the next decade. Prominent among their specific concerns, cited by 43% of respondents in the infrastructure sector and highest among all industries surveyed, are their firms' ability to meet the salary demands of existing skilled staff and prospective hires.

### Figure 5: The challenge to secure skills

**Over the next decade, would your business face difficulty in meeting salary demands of skilled employees? (Responses split by industry)**



Source: Economist Impact survey

Deploying technologies such as AI, AR and VR can help businesses adapt to workforce change, says Mr Israel. "As workforces age and employee skill sets diminish in certain fields, these technology capabilities can help maintain or increase productivity levels and reduce operational costs."

Many executives also believe they'll need to be more accommodating to workers' requests for flexible schedules—involving, for example, part-time contracts or shorter working weeks. And as advanced technologies are deployed more widely in the industry, companies will need to devise proactive approaches to upskilling and reskilling existing staff, particularly older workers. As one example of this, the US government launched an initiative to develop the workforce for infrastructure jobs in three critical infrastructure sectors: broadband, construction and "electrification".<sup>13</sup> Another example is #GetReadySG, a public-private initiative in Singapore that aims to train over 1,000 unemployed people, 40% of which will be mid-career workers. Over the span of a year, they will be taught digital skills like business intelligence and data analytics which is identified as the second most needed skill in the industry (27%).<sup>14</sup>



The need to replace existing workers calls for 25,000 new civil engineers in the US every year in this decade. On top of which, new infrastructure investments are expected to create 883,600 jobs by 2030 alone.





# Conclusion

## **Decarbonisation will continue to influence the outlook of infrastructure businesses in the coming decade.**

In addition to achieving its own net zero goals, the sector's success will depend on effectively driving climate resilience into energy, transport and communication networks for other entities such as those of cities. However, the demands for infrastructure will vary, for instance, depending on the development priorities as well as net zero goals of cities.

For many infrastructure businesses, digitalising their products and services—a necessity to help them, and cities, meet their net zero ambitions—will be a challenge. It requires organisations to have reached a high level of digital maturity themselves in their internal operations. This is something that few businesses in this industry can currently claim.

Achieving such maturity entails more investment in advanced technologies and ensuring that employees have the requisite digital skills required for effective technological deployment. More importantly, successful infrastructure businesses will redesign their processes, which accompanies new technology adoption. This requires changes in culture and mindsets, from senior management all the way down to front-line staff, to help spark greater innovation and entrepreneurialism with the help of digital technologies.

Should infrastructure businesses achieve this, most of the megatrends shaping this sector should work in their favour.

# Partner Perspective



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**As we support our clients to develop, invest in and finance infrastructure across the globe, we are very much seeing the impact of the megatrends highlighted by Economist Impact affecting our clients' objectives, plans and processes.**

Ranging from the establishment of new objectives to reduce carbon footprints and enhance climate resilience through to new strategies to build skillsets and using digital applications to enhance solutions and outcomes, the leading infrastructure players are adapting their business models to meet the challenges of a fast-changing world.

On its own, this may not be enough. A point flagged in the report but cannot be overstated is the burden on Governments to take the lead in developing infrastructure policies and programmes that are fit for the future world. There are inherent tensions between, for example:

- the cost of delivering net zero, the affordability of solutions and the willingness of users and taxpayers to bear the cost;
- between economic models based on continuing growth and the sustainability of ever increasing production and consumption; and
- between increasing nationalism and populism in countries that desperately need increased flexibility in population movement and education to address the challenges of their ageing populations.

These tensions can only be resolved by smart and joined up thinking and action at Government levels.

Technological advances and AI are clearly potential game changers, provided we can train sufficient numbers of our population to maximise the benefits. But these in turn give rise to a set of new challenges and risks ranging from cyber security and data control through to potential challenges to the manner in which we govern and control our societies.

As the article highlights, there are not only challenges but also opportunities for those entities that understand and adapt quicker than others. First mover status still confers significant upside opportunities.

At Ashurst, we in turn are evolving and refining our models to support our clients to meet these challenges and take full advantage of the opportunities. With direct insight and involvement in trends and solutions across the globe, and with an increasing range of products harnessing the incremental skills of Ashurst Risk Advisory and Ashurst Advance, we are ideally placed to help our clients remain at the forefront of infrastructure developments and solutions.

We are in a fast moving world and the pace at which issues develop and their potential impact is constantly evolving. The views reflected by our megatrends survey are today's answers. As far as infrastructure solutions are concerned, today's answers may not be enough for the challenges of tomorrow. Ashurst can not only help you ask the right questions but also guide you to find resilient and sustainable solutions for the future.





# Endnotes

- <sup>1</sup> See [Future Forces 2023 Report: The megatrends shaping business over the next decade](#)
- <sup>2</sup> <https://www.economist.com/finance-and-economics/2022/06/15/the-construction-industry-remains-horribly-climate-unfriendly>
- <sup>3</sup> <https://www.ice.org.uk/media/skjdxvjc/pres-rt-write-up-inflation-may-22.pdf>
- <sup>4</sup> <https://www.oecd.org/environment/cc/policy-perspectives-climate-resilient-infrastructure.pdf>
- <sup>5</sup> <https://impact.economist.com/projects/infrastructure-for-good/key-findings/>
- <sup>6</sup> IoT devices are objects embedded with technologies such as sensors that communicate with computing systems via wired or wireless networks.
- <sup>7</sup> <https://populous.com/innovation-pushing-boundaries-stadia-design-even-better-fan-experience>
- <sup>8</sup> <https://query.prod.cms.rt.microsoft.com/cms/api/am/binary/RE5bUw?culture=en-us&country=us>
- <sup>9</sup> <https://news.microsoft.com/en-ccc/2023/06/26/cyber-risks-to-critical-infrastructure-are-on-the-rise/>
- <sup>10</sup> [https://techinformed.com/iot-in-2023-and-beyond/#:~:text=According%20to%20Statista%2C%20there%20are,people%20worldwide%20\(eight%20billion\)](https://techinformed.com/iot-in-2023-and-beyond/#:~:text=According%20to%20Statista%2C%20there%20are,people%20worldwide%20(eight%20billion))
- <sup>11</sup> <https://www.asce.org/publications-and-news/civil-engineering-source/civil-engineering-magazine/issues/magazine-issue/article/2022/09/civil-engineers-declining-numbers-and-increasing-need>
- <sup>12</sup> <https://timesofindia.indiatimes.com/blogs/voices/the-future-of-civil-engineering-education-where-are-we-heading/>
- <sup>13</sup> <https://www.whitehouse.gov/briefing-room/statements-releases/2022/06/17/fact-sheet-the-biden-harris-administration-launches-the-talent-pipeline-challenge-supporting-employer-investments-in-equitable-workforce-development-for-infrastructure-jobs/>
- <sup>14</sup> <https://www.mckinsey.com/about-us/new-at-mckinsey-blog/reskilling-older-workers-for-new-careers-in-tech>



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