



Emerging trends in infrastructure and transportation

2025 Global Report

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Foreword: Reset 2025

We are in the midst of a Global Reset. Protection of national interests are at the top of the agenda. Economies are being reshaped. Alliances and supply chains are being rewired. The frequency and severity of weather events are increasing. And social expectations and norms are being revised.



While these changes have been underway for some time, they are not incremental. We are facing changes that are massive, lasting and disruptive. And they require infrastructure and government leaders to think very differently about the future.

Some aspects of this Global Reset are fundamental. The world is facing impacts on assets due to weather patterns that increase the need for more resilient infrastructure, governments and corporates are focusing on energy security and alternative sources of energy, the digital revolution is impacting demand for new data centers and additional power generation, and geopolitical shifts create the need to rethink supply chains and transportation. Each will create new challenges and opportunities.

In the face of ongoing fundamental change, infrastructure executives, policymakers and investors will need to be clear-sighted and willing to take risks. Big decisions should be made — often quickly and on incomplete information. And those who stare too long at the problem will likely find themselves left out of the solution. Collaboration skills are becoming more important. Visionary leaders are needed.

This edition of *Emerging Trends in Infrastructure and Transportation* is intended to provoke debate to help infrastructure executives, policymakers and investors think through the future. To develop these trends, I asked 10 of our global infrastructure leaders to provide their perspectives on how a global reset is influencing the sector. Their views provide a compelling list of trends and predictions that we believe will impact the infrastructure sector over the coming year.

But our authors don't just stare at the problem; instead, they look forward to share their best predictions on how these trends will play out in the future and offer their views on how best to navigate them.

At KPMG, our globally connected organization of infrastructure and transportation professionals are dedicated to helping public and private sector organizations make confident decisions in the face of uncertainty and complexity. From strategy through to execution and implementation, our people work alongside our clients to help them achieve their objectives — efficiently and effectively.

The old status quo has been demolished. New norms and expectations are rapidly being formed. A Global Reset is upon us.

To learn more about the trends and topics raised in this report, or to discuss your organization's unique challenges and opportunities, I encourage you to contact your local KPMG member firm.



Richard Threlfall

Global Head of Infrastructure,
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¹ Annual 2024 Global Climate Report, National Centers for Environmental Information, 2024



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Trend 1

Funding: The Great Privatization



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Jamie is the national leader for the infrastructure advisory practice in Canada. In his 30 years of experience both in Canada and the UK, Jamie has led transactions in several sectors including power and utilities, transportation, energy and natural resources, and telecommunications and digital infrastructure. Jamie’s focus is on coordinating and providing transaction advisory services across many aspects of M&A including buy-side and sell-side due diligence, carve-outs, initial public offerings, private placements, transaction management, and financings.

The infrastructure funding gap is growing exponentially. Back in 2017, the G20 thought it might hit US\$15 trillion per year by 2040.² According to the World Bank, we likely reached that point in 2023.³

All signs suggest the gap is widening on both sides. Governments are trying to balance a range of funding priorities and that is reducing their fiscal capacity for infrastructure. At the same time, demand for new and more resilient infrastructure is climbing, driven by economic, environmental, technical and social pressures. Closing the gap will be a key priority for governments around the world.

Frustratingly, the solution to closing this gap has been obvious for some time. Governments are sitting on a treasure trove of assets. Indeed, a study of 38 countries by the IMF found more than US\$100 trillion worth of assets on government books, including key infrastructure such as bridges, roads and utilities. And institutional investors are sitting on a treasure trove of capital. The world’s top 500 asset managers collectively manage more than US\$128 trillion.⁴ The alignment is obvious.



Governments recognize the solution but are wary of pursuing it.

² Global Infrastructure Outlook, G20, July 2017
³ How can we ensure that “money in the bank” leads to “shovels in the ground?”, World Bank Blogs, May 25, 2023
⁴ <https://www.wtwco.com/en-ca/news/2024/10/worlds-largest-investment-managers-see-assets-hit-dollar-128-trillion-in-return-to-growth>



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What’s more, many of the world’s leading institutional investors are extraordinarily good at managing and even improving infrastructure assets. As sources of patient capital, their investment strategies align nicely with infrastructure lifecycles. And as fiduciaries of their clients’ retirement savings, they are keenly focused on stability across the asset lifecycle.

Yet — with a few notable exceptions — most governments remain reluctant to transfer assets to the private sector. They know they have built up unsustainable levels of public debt. But many consider infrastructure to be the remit of the public sector. And they worry about the impact of privatization on service quality, access and affordability. Simply put, governments recognize the solution but are wary of pursuing it.

Reset 2025

Much will change in 2025. In some countries, rising bond yields on government treasuries will increase the cost of capital for governments. At the same time, we are seeing the retreat of bilateral investment (particularly from China) and development aid which is further undermining emerging market fiscal capacity. For those making local currency investments, a rising US dollar is adding to financial woes.

At the same time, demand for new infrastructure will likely skyrocket this year as citizens put pressure on governments to deliver quick wins, more resilient infrastructure and more modernized services. For many countries, the ability to deliver on these expectations will likely be key to helping ensure social and economic stability going forward.



The good news is that perceptions and biases seem to be rapidly evolving.

The good news is that perceptions and biases seem to be rapidly evolving. Following national elections in more than 60 countries in 2024 (many of which saw incumbents ejected or weakened), we are seeing a change of political perspectives around the world. Many of those new governments are proving to be more commercial, more realist and more open to new ideas than their predecessors.

Citizen openness to the privatization of infrastructure is also on the rise. According to the most recent Edelman Trust Barometer, citizens globally are about 10 percentage points more likely to trust business versus government.⁵ This suggests that many citizens would now be more comfortable with some infrastructure assets moving into private hands and ownership.

Our prediction and advice

This year, we expect to see significant competition between states to attract and capture patient capital. Some countries will follow India’s lead by creating a National Asset Monetization Pipeline (NMP) alongside central bodies to accelerate growth and attract private investment within specific sectors (for example, the NHAI in the roads sector or the SECI in renewable energy).

Many will focus on creating clear and consistent pipelines of assets to bring to market, supported by clear regulatory regimes and transparent oversight that protects citizen outcomes while encouraging innovation, reinvestment and reasonable returns for private sector investors. Clear cost/benefit messaging to citizens — often by aligning the sale of a particular asset with the development of a new asset or service — will likely also be key.



Tahis year, we expect to see significant competition between states to attract and capture patient capital.

In this environment, governments will need to start assessing their portfolios of assets to understand what can be brought to market, what assets require more support to become commercially viable and what assets must remain on the government books. And they will want to provide some guidance to investors around the types of assets they will bring to market and associated timelines. Messaging to citizens and to national pension funds and institutional investors will also be key.

For their part, institutional investors will need to become more proactive as a gradual increase of new assets comes to market, likely sector by sector. Given the complexity of the transactions and the quantum of investment required, institutional investors would be wise to start identifying targets and asset classes that align to their investment strategies and begin their due diligence, outreach and internal discussions as soon as possible.

The Great Privatization is coming. Preparation will be key.

⁵ 2025 Edelman Trust Barometer, Edelman Trust Institute, 2025



Trend 2

Supply chain: In search of standards

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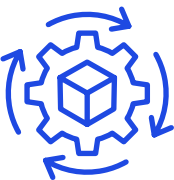
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A lack of supply chain standards is driving up costs, undermining efficiency and killing the environment.

In the era of next day delivery, one might imagine that global supply chains are tight, efficient and aligned. Yet that is not the case. In fact, the reality is that most elements of global supply chains are fractured, unstandardized and misaligned. And that is creating massive commercial and environmental challenges for companies, suppliers and customers around the world.

Looking across global supply chains, we see three key areas of misalignment. The first is infrastructure. It’s not just the quality and consistency of roads, rails and ports which differ significantly (and impact the efficiency of supply chains) across markets and regions, it’s also things like warehouses, trucks, pallets and operating systems. Every switch caused by inconsistent standards adds cost and carbon.

Regulation is another area of increasing friction. On the one hand, organizations need to comply with a myriad of different regulations related to transportation, logistics and trade. At the same time, governments are promulgating new regulations (like CBAM in the EU) to regulate supply chain sustainability. Even something as simple as different nomenclatures can add friction to the supply chain.



Most elements of global supply chains are fractured, unstandardized and misaligned.



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The third area of misalignment relates to processes – reporting processes, operational processes, supply chain processes and system processes, for example. These tend to be locally-derived, often tailored by customer and shipment, and contain significant variations. These can add cost, carbon and risk to the supply chain as vendors try to align to different processes across their customer pool.

What supply chain leaders are increasingly recognizing is that these friction points are creating massive challenges for their business operations. Friction and inconsistency can drive up costs, create more carbon, increase risks and reduce efficiency. It can make planning and investment more complex and challenging. It can reduce flexibility and agility. And it impacts supply chain transparency. Standardization would allow supply chain leaders to create more efficient and resilient operations.

The problem is that there are no central authorities responsible for supply chain standardization. In most cases, supply chain processes and operations are defined by customers. Big retailers, for example, often dictate the rules of engagement to their suppliers, both for commercial and sustainability reasons. Global industry bodies have been slow or reluctant to drive change. Regulators are moving at different speeds and, often, with different objectives. National governments are wary of overstepping their bounds.



Nobody is really focused on driving standardization across global supply chains.

Which means nobody is really focused on driving standardization across global supply chains.

Reset 2025

This year, expect to see supply chains come under massive pressure as trade wars start to heat up and new tariffs and regulations are imposed in key markets. Indeed, based on recent rhetoric from politicians globally, all signs suggest we are entering a dynamic period characterized by the implementation of tariffs and counter-tariffs. Agility will be key.

At the same time, expect to see rising demand on companies to assess and manage their Scope 3 emissions within their supply chain. In part, this will be driven by new (and likely inconsistent) regulations on supply chain sustainability. It will also be in response to growing demand for transparent carbon reporting from investors and customers. Supply chains will be under the microscope.

The combination should force supply chain efficiency up the corporate agenda as organizations seek to create more flexible, efficient and resilient supply chains. That, in turn, should encourage governments and industry bodies to more carefully study the issue and — in an ideal world — start collaborating with organizations to lead the charge towards supply chain standardization.

Our prediction and advice

To be clear, this trend is more about a change in mindsets rather than measurable action on the ground. It takes years for standards to be promulgated, socialized and finalized. It takes even longer for them to be implemented consistently around the world. Indeed, this will be a year of conviction versus action.



These friction points are creating massive challenges for their business operations

What we will see, however, is a clear recognition that something must be done. We expect to see much greater attention on this issue from regulators keen to create greater alignment across markets in order to reduce the burden on businesses and unlock new growth. Industry bodies, led by port, air and transportation groups, will likely start to build consensus around a case for change. OEMs and other giant purchasing organizations should jump on board recognizing the immense value that standardization can deliver.

For infrastructure owners, developers, operators and investors, the drive for standardization will likely bring significant long-term value. But the shift should happen fairly quickly (in relative terms). Infrastructure players should be seriously considering how they can start helping to shape and drive standards within their spheres of influence. And they should be carefully examining how the implementation of standards might influence their current plans, designs and investments.

Supply chain standardization will be a boon for companies, consumers and the climate. Infrastructure players should embrace it wholeheartedly.



Supply chain standardization will be a boon for companies, consumers and the climate.



Trend 3

Sustainability: Fixing the missing middle



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Janet Greenwood

Janet Greenwood is KPMG’s Global Lead for Sustainable Infrastructure. In 2024 Janet won The Times Consultant of the Year and Management Consultancies Association Experienced Leader Award. She is Chair of the Major Projects Associations Sustainability Ambassadors, a member of the Institution of Civil Engineer’s Inspiring Engineering Excellence Board and founder member of the Cambridge University Centre for Smart Infrastructure in Construction’s Carbon Code.

A Policy Fellow of the Institution of Civil Engineers, she has extensive experience in delivering sustainability, social value and carbon priorities in major construction projects and supporting built environment clients to deliver their most challenging programmes. She has over 30 years’ experience in the built environment, having worked across sectors such as water, wastewater, flood defense and transportation.

Sustainability has moved from a matter of principle into — simply — good business sense. Now the big challenge is in closing the missing middle between action and ambition.

Executives are recognizing that embedding sustainability considerations into decision-making is simply effective leadership. Who wouldn’t want to know where the risks are in the supply chain? What CFO would turn down the opportunity to identify where they can cut waste, costs (and, by the way, carbon)? Would any board not want to mitigate their exposure to rising commodity prices?

We have started to see business and political leaders think more holistically about the impact of their decisions and actions — not just on carbon emissions, but also on ecosystems, biodiversity, societies and individuals. With this ‘whole system’ lens, leaders are not only forming a better view of their risks but also identifying clear opportunities for action.



Who wouldn’t want to know where the risks are in the supply chain?



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Business leaders are starting to realize that we are a part of, not apart from, nature. Consider the air you are breathing. One out of every two breaths you take uses oxygen produced by forests and trees. The other comes from tiny plankton feasting on whale and fish excrement in the oceans and seas.⁶ We know we are losing the fight to protect our forests — global tree cover has declined 12 percent since 2000.⁷ We are only now waking up to how much damage we’ve done to our oceans.

The impact on people, businesses and environments is already evident. Storms and climate emergencies are becoming more common. Business costs are rising as leaders grapple with new supply chain and financing risks. The natural environments on which so many businesses depend are under attack; since 1970, the monitored population of mammals, birds, amphibians, reptiles and fish have declined by an average of 73 percent.⁸

Thankfully, the recognition that we are reliant on nature is becoming mainstream, in part as a result of helpful initiatives like the Taskforce on Nature-related Financial Disclosures (TNFD), which has published recommendations and guidance aimed at helping organizations report on nature-related issues within their businesses and take action on them.



The impact on people, businesses and environments is already evident.



Many organizations — public and private — have made public commitments that they are not setting themselves up to meet.

Reset 2025

Which brings us back to the missing middle. The reality is that many organizations — public and private — have made public commitments that they are not setting themselves up to meet. They recognize the risks that lie ahead, yet the focus remains on cost-driven thinking rather than focusing on value protection or value creation.

Inspired by a more holistic view of the risks and opportunities, we believe 2025 will see governments and businesses start to focus on resetting that missing middle. It will be a year where leaders try to align ambition with action, intent with investment and objectives with outcomes.

Our prediction and advice

Driven by key regulations and motivated by prudent corporate supply chain management, we expect business and government leaders to start asking the right questions to enact sustainable change. Building owners will likely want to know the origins and footprint of the materials they use. Operators



It will be a year where leaders try to align ambition with action, intent with investment and objectives with outcomes.

should demand more transparent sustainability information from suppliers. Governments will likely leverage their spend to embed sustainability requirements (particularly in priority policy areas like housing).

That will require leaders to reassess their commitments and policies to help ensure that — on a day-to-day basis — their organizations are doing things that actually align with their objectives and ambitions. It can also require a clear understanding of what’s within their direct sphere of influence and what is not. For many, that will likely mean focusing more clearly on high quality data informing decision-making, and capital portfolio management to identify every asset, their operating condition, their performance and their value to the organization (and its objectives). Only then can the appropriate solutions and roadmaps start to become apparent.

We have entered a new era in the transition to a sustainable future. The way to try to successfully navigate it is by addressing the missing middle.

⁶ How much oxygen comes from the ocean? National Ocean Service, National Oceanic and Atmospheric Administration, June 16, 2024

⁷ Global Forest Watch Dashboard, accessed Jan 22, 2025

⁸ Living Planet Report, World Wildlife Fund, 2022



Trend 4

Digitization: Seeing value from digital twins



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David Smallbone

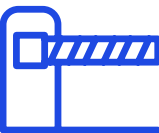
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People have been talking about digital twins for decades. Finally, the pieces are in place to turn models into value.

Vindication, at last. For more than 30 years, promoters of digital twins have been prophesying their ascendancy (regular readers of *Emerging Trends in Infrastructure and Transportation* will know we’re among the frustrated prophets). Yet uptake has been disappointingly slow, for good reasons.

Only a few years ago, the cost and complexity of developing a good digital twin was sky high. It took years just to collect the data, standardize it and drop it into a data lake. The software tended to be highly-technical and required legions of programmers and data scientists to set up. Even then, a lack of interoperability between systems often meant that scope was limited. As a result, there were few truly valuable use cases. The cost and complexity generally outweighed the benefit. Those who were able to build a business case often got bogged down trying to develop the ‘perfect’ twin.

Over the past few years, however, many of the barriers have fallen away. Technology has matured to a point where, generally speaking, data can be scooped up from almost any source and fed into the system in real-time. Coupled with new data centers, cloud computing, 5G technologies and increased processing speeds, many of the challenges organizations faced wrangling data have largely been solved.



Over the past few years, many of the barriers have fallen away.



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At the same time, the software and platforms have become much more user-friendly. Building a good digital twin no longer requires a PhD in Mathematics. Nor does using or operating one. More recently, we have seen an explosion of platforms that provide pre-built maps based on LIDAR, BIM, GIS and other existing data sources, enabling businesses and public sector leaders to roll out digital twins rapidly and cost-effectively. What is more, interoperability has vastly improved, in part thanks to greater standardization across devices, sensors and data.

Attitudes have also changed. Leaders are no longer preoccupied with creating a perfect and all-encompassing digital twin. Instead, they recognize that they can get an awful lot of value from an MVP (Minimal Viable Product). The consumerization of tech has also shifted decision-maker expectations. If I can watch my pizza travel from store to door in real-time, why can't I watch a truck leave my warehouse?

Reset 2025

Vindication should come quickly. Expect to see digital twin adoption moving both from the top down and the bottom up. On one side, a nice trifecta of lower cost, decreased complexity and increased demand for insights from executives will drive a greater level of enterprise adoption. At the same time, the democratization of digital twin technologies coupled with generative AI will allow desk jockeys to build their own library of assets. Both should be embraced.



If I can watch my pizza travel from store to door in real-time, why can't I watch a truck leave my warehouse?

Indeed, advancements in AI and machine learning will make digital twins even more predictive and autonomous, while the integration of IoT devices will further enhance real-time data collection, enabling organizations to monitor and optimize their operations with unprecedented precision.

Rapid uptake is already underway in complex, asset-heavy sectors like airports, ports and manufacturing plants. As suppliers and partners start to integrate their data into existing models, we should start to see adoption of digital twins diffuse down the supply chain.

We believe that — within the next three years — digital twins will be widely regarded as central to business decision-making. Digital twins will drive operational decisions (often autonomously) and will drive significant productivity gains through predictive maintenance. They will provide leaders with the organizational spatial awareness they need to make smart long-term decisions. They will enable better scenario planning, simulation and — as a result — capital investment planning. Digital twins will be the lens through which smart leaders view their organizations.



Those without digital twins of their core assets or operations will face questions about their control, governance and reporting.

“Advancements in AI and machine learning will make digital twins even more predictive and autonomous.”

Our prediction and advice

It won't be long before key stakeholders — regulators, investors, suppliers and customers, for example — will start to expect digital twins to be part of an organization's day-to-day decision-making. Those without digital twins of their core assets or operations will likely face questions about their control, governance and reporting. They should also expect to face competitive disadvantages as their peers move ahead with their models.

That being said, technology should never lead the business case. The digital twin journey should always start with a clear understanding of the challenge you need to solve. And it should be designed in cooperation with the end-users and operators to ensure it delivers on its objectives. With the end-user and business objective in mind, the choice of technologies, data sources, analytics engineers and visualization techniques can become much clearer.

While, in some cases, perfection is absolutely necessary (ask NASA), decision-makers should also take the time to decide what level of detail and certainty they actually require in order to achieve their objectives. Know what's 'good enough' and go for it.

For those of us who, for decades, have prophesied the impending rise of digital twins, the next few years will be truly vindicating.



Trend 5

New asset classes: Smarter infrastructure requires smarter strategies

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As infrastructure assets get smarter and new asset classes are integrated into the system, the need for a more dynamic approach to managing infrastructure is becoming clearer.

New technologies and asset classes are being added to our built infrastructure at an amazing pace. Sensors and IoT devices are being injected into existing hard assets like roads and water treatment plants. Renewable energy assets like wind farms, solar farms and battery solutions are being added to the grid. Data centers and 5G technologies are being developed and deployed in cities around the world. Robotics are being embedded well beyond production lines and into areas like routine maintenance.

Expect the integration of new asset classes to pick up pace over the coming years. In part, this will be driven by the inexorable pull of decarbonization and the energy transition, and the related impact on virtually every aspect of the economy and the way people live their lives. Entirely new industries will be created and new technologies developed. The pace of change will likely be rapid.

At the same time, the integration of new asset classes is expected to be driven by a desire to get more from existing investments. Given the deep demand for infrastructure, asset owners, operators and regulators are keen to sweat existing assets as long as possible. New technologies — like sensors and IoT devices, for example — can often provide fairly low-cost and simple ways to monitor end of life assets and extend an asset’s lifespan whilst managing risk. So expect appetite for integrating new technologies into existing assets to remain high.



Expect the integration of new asset classes to pick up pace over the coming years.



Traditional infrastructure asset management plans and strategies are no longer fit for purpose.

The problem is that new asset classes don’t always act like the traditional infrastructure they are embedded within. They will have different lifespans, maintenance requirements and replacement schedules. They will require different types of contracting terms, service level agreements and policies. Their business cases will be shorter-term with benefits realized while their implementers are still in their roles. Their management strategies will need to be more agile. Traditional infrastructure asset management strategies and plans are no longer fit for purpose. A fundamental shift in thinking is required.

Reset 2025

Say goodbye to the annual planning cycle. It’s simply too slow and cumbersome. By the time your strategy is approved and published, it’s out of date. Regardless, few (if any) tend to measure their progress to see if they hit their business case targets. More often than not, asset strategies sit in folders collecting virtual dust until the next planning cycle begins. Smarter assets require smarter strategies.

In their place, expect to see a much more dynamic approach of continuous strategy and planning development emerge. These will become living documents, evolving and updating as market demand, usage and asset conditions change. They will be informed by rich, timely and reliable data, allowing decision-makers to measure and manage performance and reassess business cases. They will provide for more dynamic governance, contracting, performance monitoring and management of assets across their various lifecycles and interdependencies.

More dynamic asset strategies and plans wouldn’t just help asset owners and operators improve their decision-making. They would also allow them to better plan and more rapidly adjust their investments as technologies, market conditions and definitions of value change. They would enable organizations to improve efficiency, performance and profitability. And they would help unlock transparent and robust reporting to key stakeholders and regulators. And it would unlock transparent and robust reporting to key stakeholders and regulators.



Expect to see many infrastructure owners and operators start to lay the foundations for a shift towards more dynamic asset management strategy and execution.

Our prediction and advice

This year, expect to see many infrastructure owners and operators start to lay the foundations for a shift towards more dynamic asset management strategy and execution. It will take some planning and effort.

For one, it likely will require leaders to develop a very clear picture of what value means for their organization, its stakeholders and its customers. And they should think about the leading indicators that feed into those value criteria and how they plan to measure and monitor them.

Technology will also be a key consideration, both at the asset level and for process automation. Robotics and drones with AI image recognition will be used to not just identify issues but to intelligently solve them. Sensors will need to be applied and visualization tools implemented (refer to trend 4). Data will need to be integrated, analyzed by Gen AI and surfaced to the right

people in a timely manner for human-in-the-loop decision making. New analytics tools like digital twins will need to be adopted and developed.

Operating models should also be assessed. New asset classes and technologies tend to lead to multi-organizational asset management models — an arm’s-length owner, a small management team, various more targeted outsourced operators and maintainers, technology service providers, and so on — that may require more sophisticated governance and operating models.

It will likely also require a shift in the talent and competencies of the organization, from top to bottom. Decision-makers should get comfortable with a much more dynamic, faster and more data-driven approach to strategic planning and execution. Data is not the new oil, it is the lifeblood of organizations, in a constant cycle of being used and renewed. At the same time, a new cohort of digitally-native talent will likely be needed to implement and operate the new technologies and approaches while being groomed for future leadership positions.

As new asset classes and technologies become more integrated into the infrastructure environment, we believe the reset from static strategic planning to a more dynamic form of continuous strategy development can unlock massive potential benefits for infrastructure owners, operators, users and regulators.

“The reset from static strategic planning to a more dynamic form of continuous strategy development can unlock massive potential benefits for infrastructure owners, operators, users and regulators.”



Trend 6

Construction: Innovation unlocked



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Clay leads the Major Projects Advisory practice at KPMG in the U.S. and has over 24 years of practical experience and research, giving him a deep understanding of how organizations can improve the performance of their construction portfolios, programs and projects by empowering their teams, enabling technology and rationalizing governance and oversight. He has been at the forefront of KPMG’s efforts to advance industry-leading methods and tools to objectively benchmark project management controls and overall project readiness.

Engineering and construction firms are under massive pressure to deliver more for less. Has the time finally come for the sector to start innovating?

The status quo in the construction industry is unsustainable. Engineering and construction companies are under mounting pressure to do more with less, to be more innovative and to become more efficient. Yet costs and complexity are rising, risks are poorly aligned and capabilities are becoming outdated. The need for change is clear. The path to change is somewhat less so.

Start with the demand pressures. Governments and businesses are under incredible pressure to deliver new infrastructure and transform existing assets. But they only have so much capital available. And it’s not enough to cover everything. So project owners are looking to cut costs, drive efficiency and get more for less. They do not have the elasticity for cost overruns or delays. Which means they are looking for construction partners to become much more efficient, innovative and reliable.



The need for change is clear. The path to change is somewhat less so.



Trend	Trend	Trend	Trend	Trend	Trend	Trend	Trend	Trend	Trend
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Pressure is also coming from the workforce. In order to attract the talent of the future, engineering and construction companies need to be experimenting, piloting and adopting new methods and ways of working. Digital natives are not looking to spend their careers conducting boring manual processes. They want new technologies, better visualization, greater innovation and more digitally-enabled workplaces. As older employees start to retire, the pressure will be on to transfer knowledge and ways of working to these newer generations of employees.

The problem is that — generally speaking — the construction industry is going backwards on innovation. Whereas many companies in other non-tech sectors tend to spend 2 to 3 percent of revenues on innovation, many construction and engineering companies don’t spend anything at all. According to KPMG’s Global Construction Survey 2023, less than half of E&C sector organizations have invested in PMIS (Project Management Information System) or basic data analytics technologies.⁹ Fewer still have adopted BIM, mobile platforms or drone technologies.

To be fair, most construction companies are facing significant challenges to innovation. Margins remain razor thin. Few have the available capital to invest into transformational technologies, particularly if there is no clear path to recouping the cost over a series of projects. Since most projects today are structured as fixed-price turnkey contracts, much of the technology and innovation risk falls onto the construction company — which is fine for well-understood projects like office buildings, but more challenging when it comes to more complex projects in, for example, the energy sector.

Most E&C companies are also ill-prepared to take on new technologies and drive innovation. Construction companies have historically struggled to attract digitally-savvy talent capable of transforming the organization and sustaining innovation. Many of the foundational elements required to enable new technologies — like cloud computing, data analytics and digitized processes — are lacking. Even if construction companies had the capital to invest in innovation, they would still struggle to transform.

Reset 2025

For a variety of reasons — economic, political and social — we expect the pressure on construction companies to grow exponentially this year, particularly within sectors where public demand is exploding. Construction companies serving the energy and infrastructure sectors will likely come under the greatest pressure to innovate. So, too, will those operating in markets with very scarce resources.

On the plus side, we see a rapid democratization of technology helping drive adoption across the construction sector. Software solutions are becoming more affordable and accessible with leading vendors now offering ‘light’ versions of their core solutions, supported by key adoption tools such as check lists and startup guides that make the solutions more accessible to more employees. Similarly, access to new AI tools and functionality is rising rapidly as these technologies become embedded into existing solutions and tools.

There have also been positive developments on the contracting and risk side with a growing number of owners now opting for cost reimbursement contracts that allow them to properly understand, assess and allocate risks in a more transparent and effective way. And that is encouraging construction leaders to explore and propose new approaches and technologies as they build their bid.



We expect the pressure on construction companies to grow exponentially this year, particularly within sectors where public demand is exploding.



Our advice is to start building the foundations that will be required to drive value from your technology investments.

Our prediction and advice

We expect this trend to start slowly within key sectors but then accelerate rapidly across industries and markets as value is proven, owner awareness increases and competition heats up. In some markets, the pace of change will likely be driven by the bigger E&C General Contractors who will work with their suppliers and subs to implement new technologies that enable better collaboration and project management. Adoption will also be driven by the structuring and uptake of new contracting models that provide appropriate incentives for innovation.

With this in mind, our advice is to start building the foundations that will be required to drive value from your technology investments. Get control of your data. Recruit new talent and build key capabilities. Assess and enhance your supply chain with a focus on suppliers who share your quest for innovation. And consider whether your operating models are still fit to drive the innovation you require.

The reality is that innovation is one of the only sustainable ways construction companies can start to do more with less (without eating into their already meager margins). It’s time to start innovating.

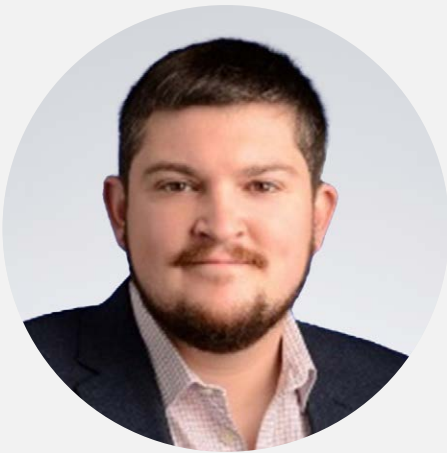
⁹ 2023 Global Construction Survey, KPMG International, April 2024



Trend 7

Resilience: Complacency will likely lead to catastrophe

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Assets are increasingly being pushed beyond their design specifications. The risk of failure — and the financial impact on asset owners — is growing.

The world is filled with infrastructure that pre-dates modern design specifications. Buildings, bridges, airports, power stations — you name it. Take a look inside most public or private infrastructure portfolios, and you’ll probably find at least half of the assets were built sometime before the turn of the century.

That’s not necessarily a bad thing. It’s not unusual to find bridges, roads — even power plants — with design lives of 50 or even 100 years. And well-built and maintained assets often exceed their design lives while continuing to deliver both financial and societal value. Why would you replace something that is still operating effectively, efficiently and safely?

Yet design specifications have changed. And for good reason. Climate events are becoming more frequent and severe. Every year we are seeing record weather events across the globe. From floods to fires, unprecedented snowfalls to extreme heat — for an asset built in the early years of this century, the conditions in which it must operate are vastly different than when it was designed just 25 years ago, and potentially only 25 percent into its lifespan.



Why would you replace something that is still operating effectively, efficiently and safely?



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In some cases, maintenance is not funded appropriately. According to the New Zealand Infrastructure Commission (and endorsed by the Institution of Civil Engineers in the UK), systems should generally reserve 60 percent of their funding for maintenance.¹⁰ At the same time, many asset owners are looking to extend the operational life of their assets as a result of short-term financial pressures.

Regardless of the reason, a failure of an infrastructure asset could be catastrophic. On the human side, power failures across a grid during a flood, or a water system during a fire, will likely lead to increased damage, disruption and most importantly, an increased risk to life and nature. The risk is also very relevant for the private sector, where the loss or disruption of business-critical assets will impact productivity, market presence and brand reputation, in the worst cases leading to insolvency.

Places once considered prepared are finding themselves exposed to significant risk. For example, despite ever-increasing preparation and preparedness for weather events, weather-related deaths in the US have increased by 20 percent since 2019, with a 120 percent increase in injuries over the same period.¹¹

Reset 2025

In just the first month of 2025, we saw devastating wildfires in California (causing damages estimated at US\$135 billion),¹² record floods in Australia (causing the collapse of a major bridge) and unprecedented winds



A failure of an infrastructure asset could be catastrophic.

¹⁰ Build or maintain? New Zealand Infrastructure Commission, February 2024

¹¹ Weather-related deaths and injuries, National Safety Council, 2024

¹² LA wildfire damages set to cost record \$135bn, BBC World News, 9 January 2025

¹³ More action needed to protect future water resources, UK Government Press Releases, 7 October 2024



This year, expect the business case for resetting our understanding of our assets to become perfectly clear.

hit Ireland and the UK (leaving over a million homes without power). Unfortunately, we are likely to see more events this year that impact critical infrastructure across the globe. Each will spark introspection and difficult questions from those affected.

Critical infrastructure is being impacted due to age, condition, lack of investment, maintenance and possibly underlying design issues. The Genoa bridge collapse, the Orville dam spillway failure, the Flint water crisis, power instability in South Africa, and the loss of 19 percent of the UK’s clean water during distribution,¹³ are just a few examples highlighting the issue. Some assets will have been pushed beyond all the reasonable principles of their original design, are no longer economically viable to maintain, and ultimately are at risk of failure.

The problem is that the world is primarily engaged in reactive measures, where risk mitigation only occurs after risks have been realized, the damage is done, and the unplanned (and often significant) costs are pushed onto a combination of shareholders, insurers and taxpayers. This year, expect the business case for resetting our understanding of our assets to become perfectly clear. And that will encourage asset owners to ensure they understand the capabilities and limitations across their portfolios today and are effectively prepared for the challenges of tomorrow.

Where asset degradation leads to the erosion of service levels, pressure to renew and protect assets will rise. This should encourage both public and private infrastructure portfolio managers to reassess their risk across their assets. Particular focus should be placed on assets commissioned prior to

the turn of the century and those deemed critical to service delivery. That will likely lead many to reassess the timing of their replacement plans and end-of-life schedules to prioritize those assets that face the greatest risk. Investment plans should be updated and new developments sequenced accordingly.

Our predictions and advice

KPMG professionals suggest asset owners should perform a pulse check across their current portfolio to assess and understand their risks and define their ambition for operational resilience. This would set the foundation for a change program articulating the case for change and defining where transformation or targeted interventions are needed. This can be used to develop a future state blueprint and change requirements to both develop asset resilience and unlock value from assets in parallel, summarized into an actionable and achievable plan.

With a clear understanding of the change requirements, a strategic delivery partner can help you transform to a resilient and sustainable asset base and safeguard your value. A strategic delivery partner framework provides a complete strategic delivery system, methodically designed and optimized to meet the needs of your organization. Focus on using a connected structure of best practice, innovation and cutting edge thinking to deliver complex projects and programs, sequenced appropriately to help ensure optimal value and resilience across your asset base, and fully integrated into your supply chain.

What is clear is that complacency and reliance on previous assumptions about your assets could lead to catastrophic events significantly impacting your organization. Is your asset portfolio resilient enough?



Perform a pulse check across their current portfolio to assess and understand their risks and define their ambition for operational resilience.





Trend 8

Capacity: Delivering the pipeline

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By 2040, nearly US\$100 trillion should be going towards infrastructure each year. Even if all that money can be found, the big question is whether the world will have the capacity to deliver it.

Demand for new infrastructure continues to grow. So, too, does demand for other construction — new housing, offices, distribution centers, data centers — the list goes on. The problem is that they are all competing for the same resources and capacity. And they are finding there is not enough capacity to go around.

Globally, we are seeing two trends converging. On the one side, there’s a talent gap. Infrastructure owners and contractors are having a difficult time finding and developing talent, particularly roles where the time to competence is long — overhead line workers, for example, or commissioning engineers.

On the other side are supply chain challenges. Volatility in the price of key raw materials is causing problems while supplies of specialist kit are increasingly hard to find. For high-demand items, particularly things like electricity cables, generators and transformers, lead times have shifted from months to years. The supply of experienced contractors is also drying up as demand shifts the power from the buyer to the seller, with many contractors becoming more selective about the jobs they choose to bid.



We are working with owners to conduct some rigorous long-term supply chain planning, mapping their needs on a range of key components out 10 years or more to better understand their future pinch points.



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The impact of these two trends converging is already creating waves across the infrastructure and construction sectors. In some cases, project owners are putting out tenders but are getting few, or even no, bids. Many job roles are taking a long time to fill. Some supplies simply aren’t showing up on time. Increasingly, we are seeing projects get delayed for lack of capacity.

Reset 2025

This year, expect to see public and private infrastructure portfolio owners really start to focus in on their supply chains. Facing growing capacity restrictions and pinch points, many leaders will likely feel compelled to get much closer to their suppliers, both to better understand their capacity and to build stronger relationships. And not just their top-tier suppliers; we’re helping owners build long-term relationships with second and third tier suppliers in their network, particularly those supplying scarce goods or services.

At the same time, we are working with owners to conduct some rigorous long-term supply chain planning, mapping their needs on a range of key components out 10 years or more to better understand their future pinch points. That is helping them schedule and sequence their ordering of key materials and understand where they need to diversify their supply network. It is also allowing their suppliers to build 10-year investment plans that align to their client’s future needs.

Talent has also become a key pinch point for owners. A growing number are trying to get much closer to talent and talent development. Where possible, they are looking for opportunities to retrain existing talent from

other functions or companies. Upskilling and development of existing talent is ongoing and we are working with many organizations to implement technology to augment their teams and automate routine activities.

For some roles, like Project Managers or Finance Clerks where skills can often be transferable, that strategy may help bridge the gap. But other roles, particularly in high demand areas like renewables, require much more time to competence and formal, focused training. Training Academies have been around for some time in places like the UK; expect to see them proliferate as sectors and governments come together to build national capacity.

Our predictions and advice

The days when you could just put out a tender and get a handful of bids are over. Leaders will need to become much more active in the management of their supply chains. That means a lot more work on understanding it and collecting data around it. It means building long-term relationships and long-term order books. It means focusing on the resilience of your supply chain and monitoring the right indicators to identify risks early.

The first step should be to understand your bank of work and identify what you are going to need both from a skills and a components and materials perspective. Then sit down with your suppliers to see what they can commit to (taking the time to verify their capacity with some smart market analysis). That should allow you to identify where your future pinch points will be so you can start developing an action plan to widen them.

“Leaders will need to become much more active in the management of their supply chains.”

Digitization and technology-enablement can help create significant value, both by helping broaden and deepen the relationship with suppliers through data-sharing and integration, as well as by helping to make supply chain operations more efficient overall. It will help reduce the need to hire as many FTEs as some of the more manual and mundane tasks can be automated.

Throughout, creativity will be important. Rather than simply building more redundancy into your supply chain, think about the outcomes you are trying to achieve and whether there might be more creative ways to go about delivering them. New ideas and approaches will likely be key.

One thing is clear: delivering the future infrastructure pipeline will require a complete reset of global construction and delivery capabilities. Until that happens, be prepared for disruption.



Trend 9

Energy transition: Prioritizing pragmatism



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The energy transition is entering a new phase driven by economic pragmatism. Maintaining momentum will likely require significant collaboration and new financing mechanisms.

Energy transition is an important climate imperative. As the source of about 75 percent of global greenhouse gas emissions, the energy sector holds the key to responding to the world’s climate challenge.¹⁴ Given the criticality of this sector as an economic engine, the transition needs to be looked at from the lens of supply security, affordability and sustainability.

Economic viability has always underpinned investments in sustainable technology. Just look at the uptake of solar and wind, for example. It wasn’t until the cost of these technologies became comparative to traditional fossil fuel generation in the late 2010s that uptake really took off. That sparked a frenzy of capacity installation — Vietnam, for example, installed some 16.6 GW of solar between 2018 and 2020 alone¹⁵ — driven primarily by economic feasibility.

Now, however, we have largely plucked the low-hanging fruit. Sectors that were able to make clear business cases for electrification — transportation, for example — have done so and are nearing the limits of their ability to transform. Until grids are strengthened and supported by energy storage options, renewables have also started to reach their limits in many markets, given the intermittent nature of their generation.



The focus is now shifting to harder-to-abate sectors and harder-to-finance projects.

¹⁴ IEA - <https://www.iea.org/spotlights/the-energy-sector-is-central-to-efforts-to-combat-climate-change>
¹⁵ Renewable Capacity Statistics 2024, International Renewable Energy Agency, 2024



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The focus is now shifting to harder-to-abate sectors and harder-to-finance projects. In some cases, these are initiatives that are either too small (a rural electrification project in Africa, for example) or too big (the commercialization of green hydrogen) for traditional finance models and investors to manage. Others may be projects that deliver massive carbon benefits but little economic return, or where the risks are prohibitive to investors.

For the energy transition to continue, therefore, leaders must take a much more pragmatic view that balances economic realities (security and affordability) against environmental outcomes (sustainability).



This year, expect pragmatism to drive greater focus on two key areas — collaboration and financing models.

Reset 2025

This year, expect pragmatism to drive greater focus on two key areas — collaboration and financing models. Start with collaboration. Despite recent rhetoric that suggests some markets might be backtracking on their energy transition goals, we expect to see most markets, particularly in Europe and Asia, come together to get ideas commercialized and get pilot projects into development.

We also expect to see greater collaboration across public and private sectors, bringing together technology companies, industry, academia and government to collaborate around innovative mechanisms and creative approaches to help unlock financing. Matchmaking tools (like DigiLeap by SEAS in Singapore) can help connect projects with technology and financing. Sharing best practices can help reduce risks by standardizing some of the contractual approaches and risk mitigation measures.

One area where we expect to see particularly strong activity is in the development of blended finance instruments. As we predicted in last year’s *Emerging Trends in Infrastructure*, there has been a significant rise in the amount of available philanthropic capital over the past year.

This year, expect to see that capital start to get allocated towards marginal projects that have high societal and environmental impact. Innovative risk mitigation models like first loss debt, guarantees and carbon credits have provided the tools to create the right financing environment to attract philanthropic and foundation capital by blending with commercial capital.

Better data and quantification around project benefits will be key to unlocking finance. Philanthropic capital wants to know that their capital is making a measurable impact, helping achieve the UN’s Sustainable Development Goals and facilitate energy transition. Measuring and reporting this data will be key to crowding in all investors, philanthropic in particular.

At the same time, capital market pressure — inspired both by investors and by carbon taxes and the like — will likely start to change the business case behind some investments which, in turn, should unlock some capital, particularly from institutional investors and asset managers eager to achieve some value creation by derisking their investments.

Climate risk models and assessment tools can continue to highlight the risk of maintaining the status quo. Irrespective of regulatory initiatives, most



We expect to see greater collaboration across public and private sectors, bringing together technology companies, industry, academia and government to collaborate around innovative mechanisms and creative approaches to help unlock financing.



Pragmatism doesn’t make the energy transition easier. But it does provide a more transparent path to achieving energy transition outcomes.

asset managers and financial institutions will realize they are staring at stranded assets and large economic losses imposed by climate events unless a deliberate mitigation and adaptation project pipeline is developed to drive the transition over the next decade.

Our prediction and advice

Pragmatism doesn’t make the energy transition easier. But it does provide a more transparent path to achieving energy transition outcomes. Expect to see significant work go into creating blended finance models (such as the US\$5 billion platform created by the Singapore Government to support the Financing Asia’s Transition Partnership (FAST-P) last year),¹⁶ supported by concession capital.

On the project and portfolio side, we also expect to see owners start to put much more focus on capturing and reporting the data required to demonstrate the expected social and environmental benefits of their projects. In part driven by companies eager to quantify their Scope 3 carbon emissions, we expect to see some standardization and improved technologies deliver an important step change in the way environmental impact is measured.

We also expect to see significant competition start to build as markets and investors vie to attract philanthropic capital and other concessional finance players like multilateral banks to their projects. Creating robust economic business cases supported by clear evidence of environmental benefits will likely be key.

We believe 2025 is the tipping point where, irrespective of populist governments and economic nationalism in some leading countries, the momentum may only increase for energy sector decarbonization. The energy transition is entering a new phase where environmental outcomes must be carefully balanced against economic pragmatism. And a new phase requires new thinking.

¹⁶ [https://www.mas.gov.sg/news/media-releases/2024/singapore-commits-us\\$500-million-in-matching-concessional-funding-to-support-decarbonisation-in-asia](https://www.mas.gov.sg/news/media-releases/2024/singapore-commits-us$500-million-in-matching-concessional-funding-to-support-decarbonisation-in-asia)



Trend 10

Shipping: Has the party ended?

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The past four years have been a bonanza for global shipping lines and their investors. Are they ready for the trade and supply chain disruptions that will be unleashed in 2025?

For years, shipping was in the doldrums. The Global Financial Crisis of 2008 hit shipping rates hard. Growth remained anemic until the pandemic. For a few months, it seemed the industry would collapse. Investors faced capital calls. Ships were idled and capacity was retired. Just as suddenly, the industry found their fortunes on the rise. Rates hit historic highs and kept climbing. Even in the face of high interest rates, demand for shipping continued to grow.

Big shipping organizations and their shareholders have been enjoying the bonanza. Many have been using the windfall to reward their investors through share buybacks and dividends. They have been ploughing profits into capital market instruments and bonds, likely as a hedge against future down-markets. And they have been ordering new capacity, filling shipbuilder’s orderbooks and pipelines.

Now, however, it seems the global trade environment is about to see significant disruption as the opening salvos of trade wars are fired in multiple directions around the world. Tariffs and trade barriers tend to reduce global demand for shipping. At the very least, they add to the complexity and friction of global trade. Volume growth may no longer be a given for shipping lines.



It seems the global trade environment is about to see significant disruption as the opening salvos of trade wars are fired in multiple directions around the world.



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For the most part, global shipping lines have done a good job analyzing the trends, running scenarios and conducting strategic planning. Unlike the fleets they operate, shipping line decision-making has been relatively agile versus other sectors. But most of it happens behind closed doors. And questions are emerging about whether that approach will allow them to remain agile in the complex environment ahead.

Reset 2025

Maybe cooler heads will prevail and markets will step back from trade wars. The more likely scenario for 2025 is one of tariffs and counter-tariffs, lower trade volumes, disrupted demand patterns and widespread stagflation (where markets are fighting stagnant growth and high inflation at the same time). The pace of change will likely also be staggering — tariffs are being announced and applied in the space of days — staying ahead may be nearly impossible.



Against a backdrop of demand instability, growing capacity, increasing pressure for carbon reduction and shifting trade patterns, we expect to see shipping rates become much more volatile in 2025.

One might also anticipate that global supply chains are about to become significantly disrupted as companies rewire their value chains to address new tariff risks and costs. For some, that will mean significant near-shoring to their largest customer bases. Others may look to new export markets, causing shipping lanes to be redrawn and demand for new ports and operators to grow.

In 2025, we expect sustainability to remain at the top of many customers’ agendas, creating competing pressures for global shipping lines. Do you retire older ships as new capacity comes online? Or do you keep sweating your assets in order to drive market share? Do you invest into alternative fuels now in order to be part of the solution? Or do you wait until a proven technology emerges?

Against a backdrop of demand instability, growing capacity, increasing pressure for carbon reduction and shifting trade patterns, we expect to see shipping rates become much more volatile in 2025. Some niche players may struggle to survive. Larger players will need to remain agile and aware in order to maintain margins.

Our prediction and advice

We believe this period of disruption and margin volatility will force many shipping lines to rethink their investment strategies. Far too little has been invested in collaboration, digitization and sustainability since the good

“Far too little has been invested in collaboration, digitization and sustainability since the good times got underway.”

times got underway. In this uncertain environment, shipping executives would be well advised to start reinvesting their windfalls into areas that will deliver longer-term efficiency and competitive advantage.

At the same time, we expect many shipping line leaders to start to expand the number of voices they bring into the room on scenario planning and strategy development. In this environment, leaders need to be able to tap into global tax and regulatory networks. They need the council of technology experts and sustainability professionals. They need to understand what’s working and what’s not working in other industry sectors.

And should disasters be averted and threats of tariff wars faded into the background, this period should still remind shipping line leaders that the world is an uncertain place. The good times were fun. But the party has ended. It’s time for shipping line leaders to refocus on the future.



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How KPMG can help

The KPMG global organization of infrastructure and transportation professionals see the bigger picture. Our people think holistically. They can leverage the organization’s multidisciplinary capabilities. They can tap into new technologies and alliance partners to help deliver outcomes. And they focus on the future to help ensure clients are enhancing their opportunities and managing their risks.

As public and private sector organizations pick up the pace of action on the energy transition, service modernization and economic growth, our people bring the insights, tools and capabilities organizations need to help create, quantify and execute their strategies more efficiently and effectively.

Global infrastructure and transportation insights with local experience

Our strength lies in harmonizing local experience with a vast global perspective. We understand the nuances of local markets, so we can tailor approaches that resonate with specific regional needs while drawing upon international best practices from our extensive operational footprint. This helps ensure that the advice provided is both locally relevant and global in scope, allowing organizations to navigate their unique challenges while staying on top of global trends.

A world of capabilities

With more than 2,500 infrastructure and transportation professionals in 120 countries providing deep sector expertise across critical projects like digital infrastructure, roads, rail, ports and energy infrastructure, KPMG member firms can help you overcome challenges at each stage of the asset lifecycle for both new and existing infrastructure.

Whether planning, procuring, delivering, operating or transitioning, our infrastructure professionals take an connected approach with strategic, commercial and technical capabilities to help deliver projects that are environmentally sustainable, socially impactful and can help drive lasting economic growth.



We’re ready to help

At KPMG, our multidisciplinary teams of infrastructure and transportation professionals are dedicated to helping public and private sector organizations deliver the outcomes they are seeking, as efficiently and effectively as possible. We thrive on helping solve some of the world’s biggest challenges. And we are eager to share our insights and knowledge as we move towards a transformed infrastructure sector.

To learn more about the trends and topics raised in this report, we encourage you to contact your local KPMG member firm.

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