



Emerging trends in infrastructure

2023 edition



KPMG in Belgium

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Foreword

2023 may represent an epoch unlike any other. Future generations may look back at 2023 with deep admiration or deep scorn. They may praise leaders for their foresight or damn them for their inaction. Leaders today have a choice. The repercussions of these choices can resonate for future generations.

The risk is that leaders allow the worst of our human nature to rule decision-making during this period of massive social, political, economic and environmental change; collaboration could falter, globalization could fail, and society could fracture. The opportunity is that leaders allow the best of human nature to win the day. Society could unite in the face of danger, adapt to change, and innovate in adversity.

The willingness to let go of the past may largely dictate how societies move into the future. They won't make much progress if they are shackled to sunk investments and entrenched systems. They won't innovate if they can't open their minds to new ideas and approaches. They won't adapt if they aren't looking ahead. And they won't unite unless they believe in a better future.



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This is our eleventh year of predicting the *Emerging trends in infrastructure*. We've been wrong sometimes. But, more often than not, we've identified the topics that have shaped the world of infrastructure over the decade. We believe many of this year's trends can shape infrastructure over the next decade.

Territorialism, inflation, sustainability, digital transformation, supply chain disruptions — the challenges humanity faces this year are monumental and potentially pernicious. What is clear is that the world is in it together. Carbon emitted in one country raises sea levels in another. Interest rate increases here push up the cost of living there. Conflict in one region can lead to famine and death somewhere else. These issues cannot be solved in isolation. Humanity must pull together.

This edition of *Emerging trends in infrastructure* — like those of the past — is as much about inspiring a change in mindset as it is about predicting future trends. Rather than simply lament the state of the world, we look ahead to potential approaches and technological solutions, raise new ideas and explore the opportunities that are being created. That's because we strongly believe that the best of human nature will win out. Humanity can unite in the face of danger, adapt to change and innovate in adversity.

We hope this edition of *Emerging trends in infrastructure* helps you think differently about the challenges and opportunities facing the infrastructure sector this year. To learn more about the trends — or to share your own inspiration with us — we encourage you to contact your local KPMG member firm.



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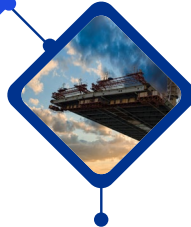


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Trend 1: Tilting towards territorialism and shifting allegiances





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Tilting towards territorialism and shifting allegiances

The foundations of globalization are eroding. Protectionism is rising. Populism is turning into unilateralism. And the ties that have bound the old geopolitical world are weakening. Political risk is everywhere, and sensitivities are high.

At a national and a regional level, we are seeing a pull away from global geopolitical consensus. Multiple fracture points are emerging — whether it be on regional lines, political lines, trade lines, environmental lines or economic lines — that are weakening the foundations of globalization. If we're not careful, we risk losing much of what society has achieved since WWII.

Where once we saw consensus-building, what we are now seeing emerge is a web of temporary unstable alliances. Relationships and allegiances shift depending on the agenda. Two countries may partner on regional defense, for example, yet still come to economic blows on a trade issue. To say a 'new world order' is emerging would be wrong — there is very little 'order' to it.

Yet the fractures are not just cracking along national borders. The tone of political discourse at the national and sub-national level has become perilously divided. Centrists seemingly have little place for common ground.

Infrastructure is one of the few places we hope that consensus can still be found. Everyone agrees on the need for new and improved infrastructure (in some markets, leaders joke that the fastest way to get a policy agenda passed is by putting the word 'infrastructure' into the headline somewhere). It is one of the few things, governments provide their citizens that they can actually see, touch and use. In a world of eroding trust, infrastructure can be the tissue that connects people with government.

For global infrastructure players — developers, investors, and operators in particular — this fracturing and shift to continuously shifting allegiances is creating complexity. Suddenly, traditional supply chains seem riskier. Costs and prices seem more uncertain. Regulation seems more fragmented, less consistent and less fit for purpose. The rules of international trade start to contradict. Work with the wrong parties, and you could find yourself blacklisted with other parties (see [trend 8](#) for more on this).

A big risk for 2023 is that all this complexity and uncertainty can slow the pace of decision-making to a crawl. Right now, however, action is needed, and lots of it. Populations need more infrastructure and more leadership, not less. Our advice to infrastructure players is to keep their new geopolitical and supply chain security lenses on a pivot. In a world ruled by unstable temporary alliances, awareness and agility may be key.



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Trend 2: Backed into the sustainability corner





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Backed into the sustainability corner

At the COP27 meetings in Egypt, there seemed to be a tacit recognition that the 1.5-degree goal enshrined in the Paris Agreement had become unattainable. But that does not suggest the fight against climate change is now over. Rather, it means we now need to fight harder.

What is clear to everyone is that the timelines have shrunk. And the potential impacts of climate change are no longer someone else's problem. Outside of those who happened to live on an atoll, most people probably didn't really comprehend the big risk of slowly rising sea levels. Now they are seeing the realities of climate change on their own doorstep, manifesting as floods, hurricanes, extreme heat and cold events and drought. At the individual level, the risks of climate change have become personal, and the costs have become real. In many ways these risks allow the crisis to become real to more people.

This year, we expect to see individuals and organizations take serious steps to move from talk to action. Much focus will likely remain on mitigation (anything we can do to keep global warming and climate change to a minimum is welcome, even if humanity overshoots the 1.5-degree goal). But growing focus will likely be placed on adaptation as people come to terms with what it means to live in a climate-stressed world. There may also be multiple paths to adaptation, though some require a fundamental shift in mindset.

Much of the heavy lifting will likely fall on the shoulders of the energy and infrastructure sectors. The trick will be in coming up with approaches that help solve the trilemma of security, affordability and sustainability at pace. However, we also expect

to see a significant shift in investment towards research into cleaner fuels, carbon abatement and energy efficiency. And while these, along with innovations in new green technologies like green hydrogen, should not be used as an excuse to delay action — they do still offer hope that Scope 3 emissions can be rapidly eliminated, and the 1.5-degree goal can still be salvaged.

The problem is that governments — having stated lofty goals and attended high profile conferences — have been maddeningly slow to move their feet. Simply put, the search for perfection is becoming the enemy of progress. In part, this speaks to the enormity and complexity of the task. It reflects growing concerns about the cost of the transition and who is going to fund it (see [trend 7](#) for more on this). Government progress is also slowed by the concrete boots of an embedded cost mindset and sunk costs (as discussed in [trend 9](#)).

Our advice to governments and infrastructure players is to leave the old mindsets behind and factor sustainability into decision making now. Retrofitting using an old mindset is going to be more expensive, less effective and more disruptive. And history has proven you can't win this fight doing what you have done in the past.

This year, expect to see sustainability become more formalized as a basic pre-requisite for all new infrastructure development, with developers, owners and investors starting to think not just about financial budgets, but also about carbon allocation ones.

Now that society is backed into a corner on sustainability, people need to start thinking differently. And that means doing things smarter, quicker, better and faster.



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Trend 3: The Age of Mass Customization emerges





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The Age of Mass Customization emerges

The Industrial Age is over. Humanity is now in an age of mass customization. And the relics of the industrial system are losing relevance. In the past, infrastructure was all about building monolithic ‘factories’ where people could receive a standard service. Organizations and governments built massive ‘healthcare factories’ where people could go when they were sick. ‘Education factories’ where students could learn a set curriculum. Even ‘mass transit factories’ in the form of set-piece systems with rigid structures that moved people along the most common routes.

In their place, customized solutions are emerging. We are seeing the emergence of specialized health providers focused on unique conditions. We are seeing the wide-spread adoption of ride-share and mobility options that take people from door-to-door. We are seeing the development of individual educational journeys, tailored around the unique need of each person (some school districts already use AI to identify students with special needs, often far faster than their human teachers can, so learning programs can be personalized).

In many respects, this shift is good news for consumers. It means users are able to get more value from their infrastructure. It reduces the waste of providing services people don’t actually need or use. Perhaps most importantly, it offers an opportunity to make infrastructure more inclusive and accessible.

The Age of Mass Customization is about personalizing infrastructure to the user — both in its physical manifestation and in the way we use it. And that will require a step change in digitization (see [trend 5](#)), new business and services models. Focus can be placed on creating unique experiences for users while protecting their data, their privacy and their interests. Infrastructure value chains will likely need to be adapted to

achieve better response times and higher value. Enabling technologies (like 5G) and emerging approaches (like the metaverse) should be integrated.

The problem is that this move towards customization is happening despite existing infrastructure and policy, not because of it. In fact, more often than not, the shift is being driven by private players who — having spotted a need in the market — took advantage by appealing to the individual consumer rather than the faceless taxpayer. Just consider how community-driven navigation map apps, absent government support, have rerouted the way people travel. Or how private specialist health providers are rerouting patient pathways.

The challenge facing infrastructure providers and governments is two-fold. The first big challenge is how to remain relevant in an age where technologies and private players are already disrupting the service delivery model. Governments may need to rethink where and how they will play (or perhaps, just intervene) in the provision of infrastructure. In part, this requires new ideas and models that eschew the industrial age and embody the age of mass customization. It will likely also require some tough decisions about what to do with existing industrial age assets (as discussed in [trend 9](#)).

This year, we expect to see infrastructure players and governments start to focus more on what they deliver rather than how they deliver it. Instead of providing assets or services, they can focus on generating outcomes. Instead of adding more capacity, they can focus on adding more options. Instead of building monolithic temples, they can start thinking about how to create tailored, customized services that help meet the needs of tomorrow’s individual citizens.



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Trend 4: Inflation, pricing and supply elevates the risk



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Inflation, pricing and supply elevates the risk

A health pandemic, followed by a supply chain pandemic, leading to an inflationary pandemic. The big worry for infrastructure players is that the next stop is a bankruptcy pandemic.

The continued volatility and financial disruption of the past few months have certainly not been easy for infrastructure players. We are seeing infrastructure planners and owners struggling to budget for projects that will take years to deliver and decades to finance. As costs rise, return on investment equations rapidly change. As inflation bites, so does affordability.

What's worrying infrastructure owners and investors is that, more often than not, the price risk in today's contracts flow down to the developers and contractors. For years, costs had remained fairly stable and price risk was generally considered a symptom of poor cost management. It only made sense that those with the greatest control over cost discipline should also hold the cost risk.

But, today, the link between risk and discipline has become unhinged. No amount of cost or price discipline can protect margins during times of inflationary shocks, supply constraints and volatile commodity price fluctuations. And few contractors understand how to properly price inflation and cost volatility into their contracts. US consumer price inflation hasn't topped 4 percent in more than 30 years¹ which means few developers have any real experience dealing with the issue. Not surprisingly, many infrastructure planners, owners and investors are dreadfully worried that their supply chain is about to go bust.

Yet this is not the first time the world has experienced inflation and supply issues. Some markets — such as Turkey and Venezuela have been suffering through high inflation for years.

Any Baby Boomer reading this article will likely remember running dozens of different price scenarios, based on different inflation assumptions, across their investments (business and personal) in the early 80's. In those days, US inflation topped out at 13.5 percent. Yet, still, things were built, investments were made, and infrastructure was delivered. The trick now is to remember how uncertainty was factored in historically.

Over the coming year, we expect to see owners and investors start to rethink who should actually own the cost and price risk on their assets and investments. Strong trust and cooperation between public and private sectors, owners and contractors, developers and operators, and buyers and suppliers will be key. For some, that may lead to a style of contracting that more closely resembles 'open book' than in the past, while still maintaining a level of price discipline between the contractor and the owner. The challenge will likely be to maintain price discipline while allowing for prudent risk sharing.

At the same time, global supply chains are shifting in response to geopolitical risk and pressure (see [trend 8](#)). Contractors and developers may need to start rebuilding their strategic procurement functions, led by a greater focus on price and cost discipline and robust scenario planning capabilities. Governments may need to find the fiscal space to invest in infrastructure in order to boost economic activity (frankly, they may have no other choice).

To be sure, supply chain bankruptcy would be a worst-case scenario this year. But the risk of not building anything at all would be much, much more dangerous over the long-term.

¹ <https://data.worldbank.org/indicator/FRCPI.TOTL.ZG?locations=US>



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Trend 5: Getting the most from digital





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Getting the most from digital

Nobody denies that digital transformation can deliver massive potential benefits for infrastructure owners, operators and users. The use cases are manifold. The value is quantifiable. The capabilities are plentiful. So why is it taking so long for infrastructure to actually embrace digital?

Part of the challenge is that brownfield infrastructure is notoriously difficult to digitize. And the business case doesn't always stack up. Data quality is often a challenge. Many older assets also struggle with investment timelines, resource commitments and legacy system integration. They also need to be able to quantify the potential benefits which can include better information, more efficient operational management and more effective planning.

In many cases, the ability to optimize existing assets is limited by regulatory constraints that were in place when the asset was planned and designed. However, many brownfield owners are still finding opportunities to vastly improve their asset management through the effective use of data analytics tools and the adoption of newer technologies such as smart meters, predictive maintenance systems and optimization tools.

There is no excuse on the greenfield side. Here, digital should be embedded into every aspect and phase of infrastructure development — from design and planning right the way through to operation and eventual closure. It should connect every player in the value chain and in the ecosystem together around reliable

sources of data. It should drive performance, monitoring and reporting. It should be the *de facto* foundation stone of every physical asset.

This is clearly what many owners, operators and investors are looking for. Those responsible for driving long-term efficiency and performance from infrastructure assets want to use AI to enhance decision-making, IoT to enable predictive maintenance, and digital dashboards to drive monitoring and reporting. But that requires data to be flowing across the asset lifecycle, between operational siloes and through every node of the value chain. And that requires designers, contractors and developers to get on board.

The big question is whether infrastructure owners, procuring authorities, investors and operators are willing to pay for it and whether they can offer the right incentives into their supply chain to encourage digital design and cooperation. The next big question is whether they will have the right skills and experience to translate their digital capabilities into actual insight and value creation.

This year, we expect to see significant pressure on contractors and developers to up their digital capabilities and integrate into the wider value chain. We also expect to see more infrastructure players work to overlay data with experience — applying human capabilities to drive real value from data. Yet progress will likely remain slower than most owners and operators hope. Finding the accelerator will be key.



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Trend 6: Cities look for purpose



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Cities look for purpose

If you thought cities would return to normal after the pandemic, prepare to be disappointed. Too much has changed. Hybrid and remote work models are here to stay. Retail patterns have changed indelibly. Citizen expectations and needs have rapidly evolved. And the way people interact with their infrastructure has been transformed.

Even before the pandemic struck, city leaders knew they were in tight competition for resources, investment and talent. They recognized that the ‘magnetism’ of cities had changed polarity. Rather than drawing in the best and brightest, some cities had become synonymous with urban blight, decay and broken dreams. The pandemic made it clear that cities could no longer rely on their network effect alone.

In established cities, we are seeing new technologies and concepts radically disrupt the character of the CBD. The most obvious have been the shift to remote work (which moved commercial workers out of office buildings and into suburbs) and the rapid adoption of e-commerce (which shifted retail workers out of stores and into distribution centers). But new ideas and technologies are rapidly taking shape. Some cities are considering building underground distribution systems to get delivery trucks off local roads. Others are already in pilots to see if drones can do the same thing. Less futuristic ideas are also taking hold — such as the ‘space-time shifting’ of city activities to balance out resource usage and congestion.

Here, the developing and emerging markets have the upper hand. With less legacy and fewer sunk costs to worry about, we are seeing a range of new concepts floated (and occasionally financed) that could radically reshape the city as we know it. From Saudi Arabia’s proposed mega-city, The Line, through to Hong Kong’s new metropolis, we are seeing new cities being designed and developed as role models of the shared economy where work, play and live agendas overlap. Existing cities have to sprint to keep up. Some will, some won’t.

Every city and every population is unique. And so each government will need to create a vision for their city that is consistent with the norms and customs of their own society. Radically different concepts will likely emerge, thrive and peacefully coexist. Policy makers will need to be able to translate these expectations and demands into the design of their cities — particularly when it comes to housing, transport and commercial infrastructure. Each city and society will evolve in line with their unique attributes. One size doesn’t fit all and there will be an infinite number of adaptation pathways. There may be massive opportunities for the private sector to play a key role in driving the economic engines that cities represent.

This year, expect to see city, regional and national governments start to engage in real and collaborative debates on what value cities can deliver. And, with that, expect to see a much greater focus on bringing together the essential ingredients to drive the work, play and live agenda.



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Trend 7: Institutional players drive the climate agenda





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Institutional players drive the climate agenda

Governments have big ambitions on climate change. But they also know that the cost of the required structural changes will likely be enormous — some estimates suggest upwards of 7 percent of global GDP between now and 2050. This, at a time of massive pressure on government pocketbooks, rising inflation and justifiable debates on who holds the costs and reaps the benefits of climate change.

Perhaps not surprisingly, governments are looking to institutional investors to help finance the costs. In many ways, this makes a lot of sense. Institutional investors command some US\$100 trillion in assets under management.² That's more than the world's total annual GDP combined.³ From a pure capital perspective, it's clear the money is there.

Institutional investors are also long-term investors. This isn't just about patient capital. It's about investors who understand the long-term effects of climate change and are invested enough to want to do something about it. And over the past few years, many have become much more active in their management of their assets, working with their investments to deliver real and measurable decarbonization goals.

We are certainly seeing institutional investors wield the power of their capital to drive climate outcomes. Some asset managers have already stated they will raise the cost of capital for those

not currently actively decarbonizing.⁴ Others suggest they will pull back long-term financing altogether. Some large insurers and reinsurers, for example, are saying they will no longer invest in or insure most oil and gas projects as of next year.⁵ That will be a rude awakening for anyone seeking long-term capital for less-than-clean projects.

Whether or not the new economic realities will dampen their ambition is an open question. Urgent issues around energy security and the rising costs of energy in many markets may force some owners to keep their assets running longer or to continue investing into assets they had once disavowed. Current market volatility is also forcing some asset managers (particularly those more mature pension funds with rising obligations and shrinking contributions) to rebalance their portfolio of liquid and illiquid assets to achieve their objectives.

Over the coming year, we can expect institutional investors, governments and owners to become much more comfortable allowing the power of capital to drive climate outcomes. In part, this may stem from a maturation of global standards (led by organizations like the Climate Change Task Force and the International Sustainability Standards Board). But it may also be driven by a sense of desperation as citizens, governments and policymakers grasp for any help they can get on the climate agenda.

² <https://www.statista.com/statistics/323928/global-assets-under-management/>

³ <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD>

⁴ <https://www.bloomberg.com/news/articles/2021-11-09/cost-of-capital-widens-for-fossil-fuel-producers-green-insight>

⁵ <https://www.munichre.com/en/company/media-relations/statements/2022/new-oil-and-gas-investment-underwriting-guidelines.html>



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Trend 8: Globalization gets buffeted by security





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Globalization gets buffeted by security

Did Janet Yellen ring the death knell on globalization? Standing in an industrial park in South Korea last summer, the US Treasury Secretary called on companies and governments to rethink their global supply chains and trade flows to prioritize allies and trusted partners. Since then, the idea of ‘friend-shoring’ has been espoused by politicians, trade organizations and policymakers as geo-political risks change the dynamics of supply chain strategy.

“Working with allies and partners through friend-shoring is an important element of strengthening economic resilience while sustaining the dynamism and productivity growth that comes with economic integration,” Yellen argued.

Supply chain managers shuddered. For years, the mantra of supply chains had been lowest-cost and lowest-inventory. Private equity had wicked every drop of capital out of the process. Just-in-time was all about keeping supply chains and inventory as tight as possible.

And then COVID-19 happened. And Trump’s trade wars. The Russian government invaded Ukraine. Cracks started to appear in global trade agreements. And companies scrambled to secure their sources of supply, build up inventory and develop new redundancies. Investing into ‘friendly’ markets and suppliers suddenly seems like a smart idea.

This isn’t just about securing supply chains. It’s also about securing infrastructure. Governments increasingly recognize that their assets could be vulnerable to insecure supply. And they are taking a heavier hand in helping infrastructure owners decide where they can source key bits of kit from, and who they can work with to operate them.

The implications for global infrastructure players are potentially massive. Given the fractures now shattering the old-world order and the growing shift to temporary, issue-specific flexible alliances (see [trend 1](#) for more on this), many may find it increasingly difficult to stay on the right side of their customers. With a raft of new supply chain transparency regulations being promulgated, secrets (trade or reputational) will likely be hard to keep.

As most supply chain managers know, it takes significant time, effort and investment to rework supply chains. Organizing around cost was fairly straight forward; organizing around the strength of one market’s relationship to another is more challenging. There may be no simple decisions.

This year, expect to see infrastructure players start to rework their supply chains into more dynamic supply webs that form around security of supply. And don’t be surprised to see some significant fallout as less-friendly markets and companies get dropped.



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Trend 9: Dealing with sunk costs and abandoned assets





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Dealing with sunk costs and abandoned assets

Infrastructure assets are expensive. And they are made to last decades. So, there is an obvious reluctance to abandon them early. Yet society's needs and expectations have changed. Climate change has rewritten the value equation in many markets. And technological change has upped the risk of obsolescence.

Humans are sentimental creatures. We don't like to throw things away. Doubly so if we have put equity (financial or emotional) into it in some way. The problem is that an obsession with sunk costs is slowing the ability to transform. Some hold on to assets that no longer meet value equations. Others formalize processes that no longer work. Many cling to models that no longer reflect reality and subscribe to schools of thought that only reinforce the past.

The potential risks of trying to solve new problems within an old context and mindset are huge. It limits the imagination. It stifles innovation. It slows investment from flowing into new ideas and technologies. It increases costs, encourages waste and creates redundancy. If society is to move peacefully and confidently from the industrial age to the age of mass customization (see [trend 2](#)), it should become much more willing to abandon the status quo and encourage greenfield thinking.

The transition may be the tricky bit. Rather than trying to replace the current kit with lower-carbon alternatives, people should be asking "what we are actually trying to achieve" and then come up with low (or no) carbon ways to do that. And carbon is only one of the important variables. Electric cars offer a good case in point. There may be a point where the damage caused by manufacturing

the electric car outweighs the damage being done by the combustion engine it is replacing. Perhaps a better question is do we all still need to own cars to move around? But few are asking if we still need cars. The sunk costs embedded in road systems, fuel stations, traffic technologies and vehicles force us to cling to cars.

Even if people were to give up on traditional thinking tomorrow, we would still have to contend with a mountain of sunk costs and abandoned assets. What do you do with a coal plant that no longer meets sustainability expectations? Do we simply put out a closed sign, board up the door and walk away? That would leave a lot of investors holding the bag. Do we instead let it be sold down to an operator with fewer scruples or transparency requirements? That would only transfer the problem, not solve it. So is there an alternative that sees investors pour more capital into it, incrementally improving its footprint until it does fall within parameters? We hope so. But that will require new ways of thinking and new approaches to financing, funding, and regulation.

We suspect there will be multiple paths to adaptation and evolution for systems, assets and individuals. Some may lead to dead ends. But we must continue to explore each avenue as we search out a way forward. Scenario planning will be key in this regard.

This year, expect to see infrastructure planners and investors start to think more creatively about the problems they face and the outcomes they hope to achieve. Continuously polishing the status quo will not get us where we need to be. Infrastructure owners and investors need to be willing to walk away from our sunk costs and assets in order to find a better way.



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Trend 10: The definition of infrastructure evolves





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The definition of infrastructure evolves

What is infrastructure really? In the past, it was pretty easy to identify. Infrastructure was stuff that governments built in order to deliver on citizens needs and policy agendas. Now those lines are blurring. Infrastructure is no longer the remit of government alone. It does not always deliver on citizen needs or policy agendas. In many cases, the lines between sectors are rapidly blurring.

Many of the traditional energy majors, for example, now see themselves as technology, mobility, energy and infrastructure players.⁶ Big tech firms are positioning themselves as connectivity providers and — in the metaverse — service providers.⁷ Even old school infrastructure is getting in on the game. Fiber, power lines and other pieces of kit are being integrated into roads. Schools are doubling as community centers, cooling stations and flood protection. The concept of ‘infrastructure’ is broadening to be much more about serving the needs of society than delivering a specific asset. This is good.

Instead of an increasingly centralized and overlapped future reality, we also see another option where infrastructure investors, operators and owners shift towards collaborative, evolving partnerships and ecosystems — flexible federations of

organizations working together on clear outcomes and use cases. Partnerships tend to see two parties working together to achieve a specific outcome. These federations can instead prioritize fluidly combining capabilities in order to better respond to citizen needs.

Given all of the trends we have raised in this report — the shift to issue-specific alliances, changing supply chain expectations, rising economic uncertainty, unsolved questions about existing assets, digitization and the shift to the age of mass customization, encouraging this type of flexible federation of capabilities may prove to be the only way that governments may be able to execute on their agendas. They certainly can’t do it alone. And jumping into bed with one big partner to the exclusion of others has proven to be unpopular with citizens who worry about who is controlling their infrastructure.

What is clear is that the definition of infrastructure is evolving. The competitive landscape is rapidly changing. Governments are no longer the sole purveyor of infrastructure. There will likely be implications for everyone in the sector.

⁶ <https://autovista24.autovistagroup.com/news/why-big-oil-companies-are-investing-in-electromobility/>

⁷ <https://edition.cnn.com/2022/10/30/tech/meta-metaverse-transition/index.html>

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