GLOBAL INFRASTRUCTURE INITIATIVE
By McKinsey & Company

2021 GII Summit: Project of the future

Outcomes Report
May 2021

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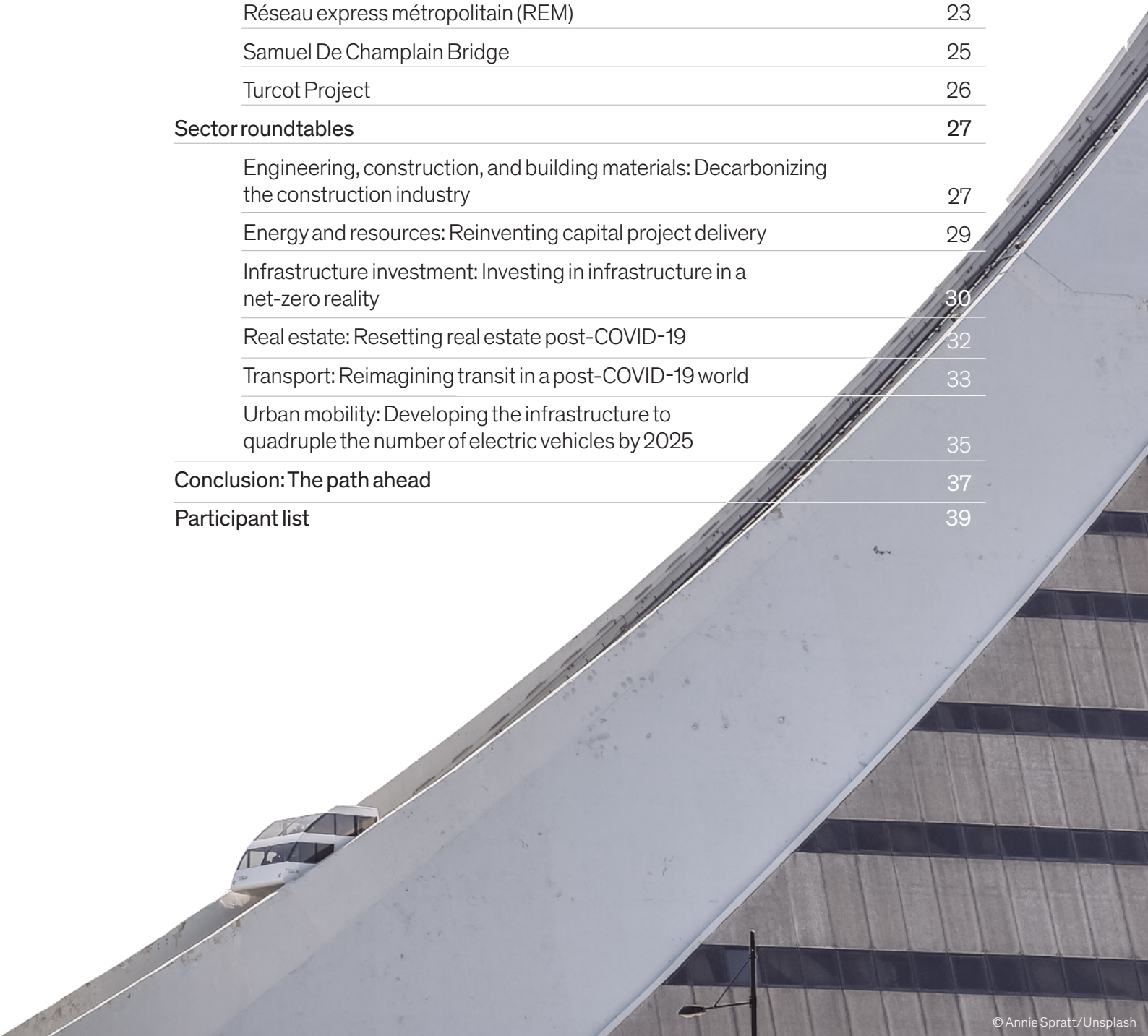
Table of contents



Introduction

Capital projects and infrastructure have always played a critical role as a foundation for a competitive and healthy business and living environment. Given the economic and public-health impacts of COVID-19, the importance of collaborating to deliver quality projects on time and on budget has only increased.

In 2012, the Global Infrastructure Initiative (GII) was established as a forum for global leaders to collectively tackle the challenges facing the industry. In the nine years since our inception, GII has grown from our first 150-person Summit in Istanbul to a thriving community of more than 6,000 global leaders engaging from across sectors and the entire value chain.

In April 2021, GII convened its seventh global Summit, bringing together more than 500 leaders from 18 of the G20 nations, which collectively represent 87 percent of global GDP. Attendees' organizations are representative of the broadly defined $11.6 trillion global infrastructure industry, including those who plan, finance, build, and operate capital projects and infrastructure from sectors such as transportation, energy, and real estate. This assemblage strives to shape the future of infrastructure and capital projects.

This year's Summit put four pillars front and center: digital and analytics transformation, collaborative project delivery, leadership and workforce development, and future-proofing infrastructure (see sidebar, "The four pillars of the 2021 GII Summit"). This report recaps the best ideas of the 2021 GII Summit and shares the voices and perspectives of leaders from across geographies and sectors.

We wish to acknowledge our 2021 GII Summit partner organizations, who have been instrumental in contributing to the content and development of the GII community over the past two years: our strategic partner Caisse de dépôt et placement du Québec (CDPQ); our pillar partners, Bentley Systems, Clifford Chance, Spencer Stuart, Trimble, and WSP; and our institutional partner, Canada Infrastructure Bank.

Steffen Fuchs
Co-chair, GII

Shannon Peloquin
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The four pillars of the 2021 GII Summit

Digital and analytics transformation

The industry has recognized the significant productivity gains that can stem from digitization and analytics applications. To move beyond pilot projects and experimentation, organizations must undertake comprehensive transformation efforts at both the enterprise and project levels. This pillar focuses on how to create change at both levels while embracing the most promising use cases across digitization, automation, IoT, and analytics.

Collaborative project delivery

Major capital projects come with built-in tensions that often discourage trust-based cooperation and can result in claims and variations that bust budgets and deadlines and compromise productivity. Increased collaboration can help align stakeholders, inspire innovation, and establish outcome-focused measures of progress. This pillar explores best practices in establishing financial incentives, risk-sharing structures, collaborative contracts, and trust-based relationships to prepare for the anticipated shift toward an integrated and digitally enabled approach to project delivery.

Leadership and workforce development

Modern infrastructure and capital projects demand new skill sets in every phase—and by every actor involved. Industry transformations are not likely to succeed without a focus on leadership, culture, organizational structures, and talent. Therefore, fresh perspectives, which come from cultivating a diverse workforce, will be essential to long-term success. This pillar considers how contractors, industry bodies, and governments can attract and train workers as well as build new cultures and diverse capabilities at scale.

Future-proofing infrastructure

Emerging technologies are advancing faster than initially expected, and complex risks—from cybersecurity to climate change—continue to intensify. Ensuring infrastructure projects deliver their intended economic, environmental, or social benefits requires analyzing future states in the planning process; designing and building flexible, multiuse assets; and identifying diverse revenue streams over an asset's life cycle. This pillar tackles the processes that must be implemented to deliver resilient infrastructure.

Best ideas from the Summit

Project development

- Use infrastructure investment to drive multiple outcomes—jump-starting economies, enabling job creation, creating an inclusive economy, and building a foundation for future growth.
- Prepare for new definitions and metrics for project success—incorporating decarbonization, sustainable materials, resiliency, and social equity.
- Provide more long-term stability and visibility to infrastructure pipelines—long-term funding sources such as infrastructure banks, reinforced by national infrastructure plans with prioritized projects over a multiyear time horizon can help engage private capital.

Project delivery

- Evolve from restrictive contracts to deeper collaborative approaches—building trust across the owner and project design or delivery team will improve project performance and reduce risk.
- Engage owners in technology adoption—incorporating owner participation or use of technology throughout project-design and delivery to ensure successful operations and maintenance. Technology providers need to do a better job of quantifying the benefits of digital adoption.

Digital and talent strategy

- Move from experience-based to data-driven decision making—using shared digital, data, and analytics platforms, and collaboration across the value chain.
- Attract and retain the required new talent—through workforce planning and by clearly communicating the industry's role in society and an organizational commitment to sustainability, diversity, equity, and inclusion.

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The project of the future

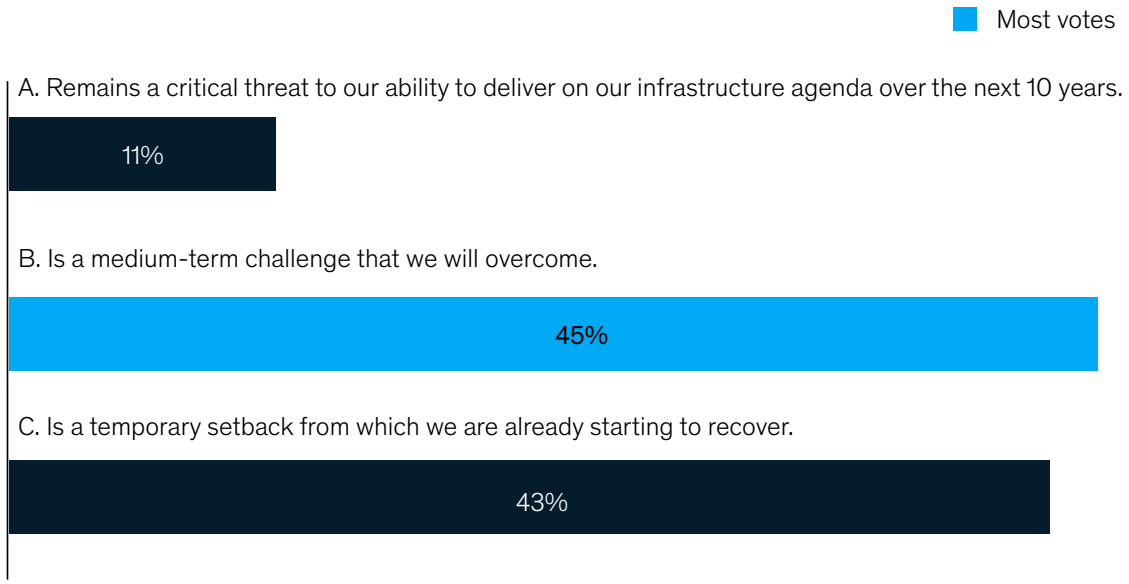
Global industry trends—such as digitization, industrialization, vertical and horizontal consolidation, and rising technology investment—are poised to dramatically change all stages of the project life cycle. The COVID-19 pandemic has only accelerated those trends and highlighted the opportunity to design a recovery that puts sustainability and inclusivity at the top of the agenda.

It was notable that while the COVID-19 pandemic offered ever-present context for the discussions, just one in ten Summit attendees who participated in a live poll said they believe it remains a critical threat to our ability to deliver on our infrastructure agenda over the next decade. The rest were evenly split on whether the pandemic is a two- to five-year challenge or if we have already started recovery (Exhibit 1). Compared with the June 2020 GII Summit, the only shift is that more people believe we are already in recovery.

Several overarching key takeaways on the shape of the project of the future emerged and were reinforced throughout the Summit.

Exhibit 1

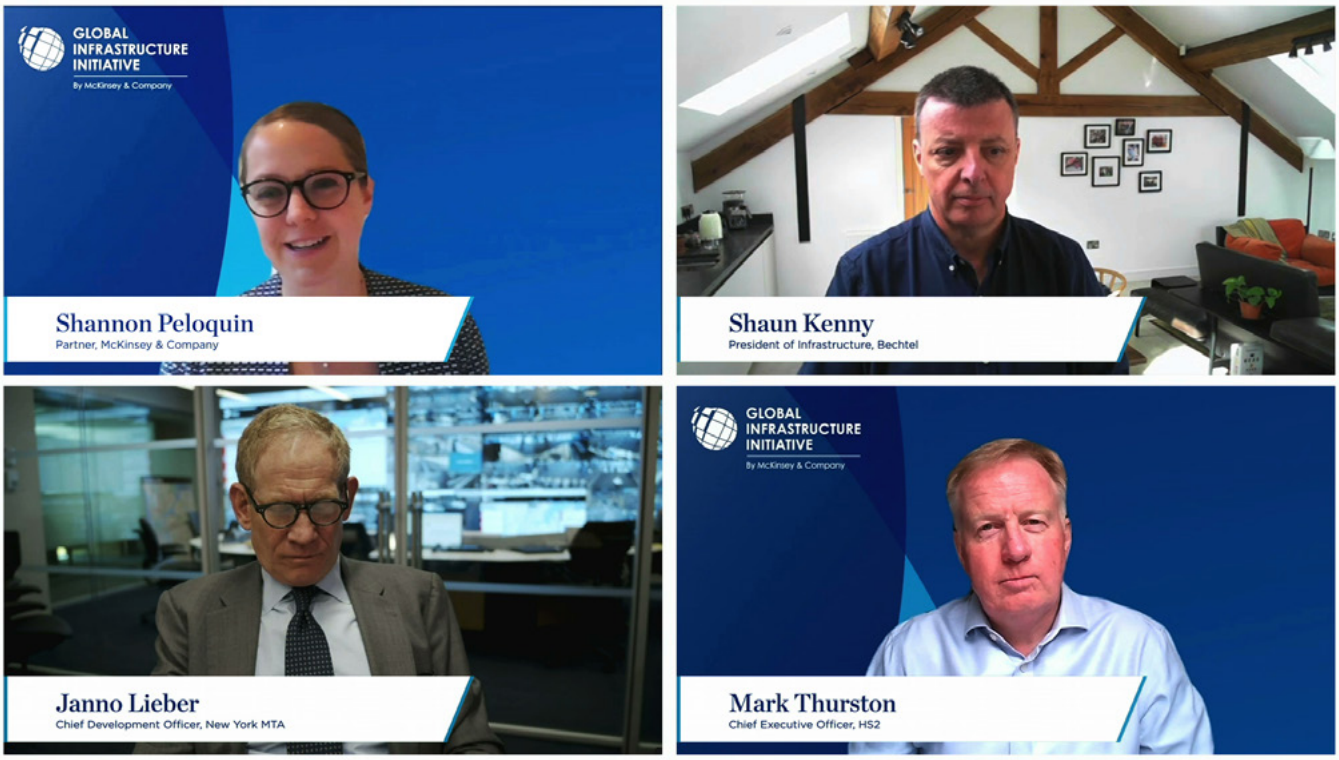
As compared with the 2020 GII Summit, the number of respondents who believe COVID-19 recovery is already happening increased.



Note: Figures may not sum to 100%, because of rounding.

Reconsider the "what" and "how" of major projects. The "what" encompasses the types of projects being prioritized, from renewable generation to decarbonization of existing facilities; improving transport in and around cities; and digital connectivity and control. The "how" brings to bear questions of reducing emissions across the project life cycle, from design through operations, as well as increasing the social dividend of infrastructure and optimizing productivity through technology. "In our business, the companies that aren't adapting to technology are probably not going to be around in ten years' time," said Shaun Kenny, president of infrastructure at Bechtel. "To achieve these goals, to amplify their effect, we're going to need to be much more purposeful, much more aligned, and much less disaggregated than we are now as an industry."

Take advantage of unforeseen opportunities. With ridership down 95 percent at the outset of the pandemic, the New York Metropolitan Transportation Authority went on a construction campaign. "We took advantage of the fact that there was low ridership to attack work in a way that never had been done before," said MTA President and Chief Development Officer Janno Lieber. "And we ended up with a greater number of completions on a dollar basis than any other year in MTA history."



Adopt a more holistic approach to procurement and investment. Owners and investors are increasingly expanding the scope to a more sophisticated evaluation of factors, such as schedule, innovation, and environmental, social, and governance (ESG) metrics.[1] "What we have seen—especially in the last 12 months—is a real intensification of focus on all matters ESG," said Michael McGhee, a founding partner of Global Infrastructure Partners. And this attention is expected to grow in the years to come. "Five years ago, there was a lot of lip service paid to this—even two years ago. But those people paying lip service now are making a mistake. This is for real. And it does require real and solid action," McGhee said.

[1] For more on this shift, see Jim Banaszak, Corey Hopper, and Garo Hovnanian, "Infrastructure tendering in the midst of COVID-19," McKinsey Global Infrastructure Initiative, January 2021, globalinfrastructureinitiative.com.

Jamshed Khedri/Unsplash

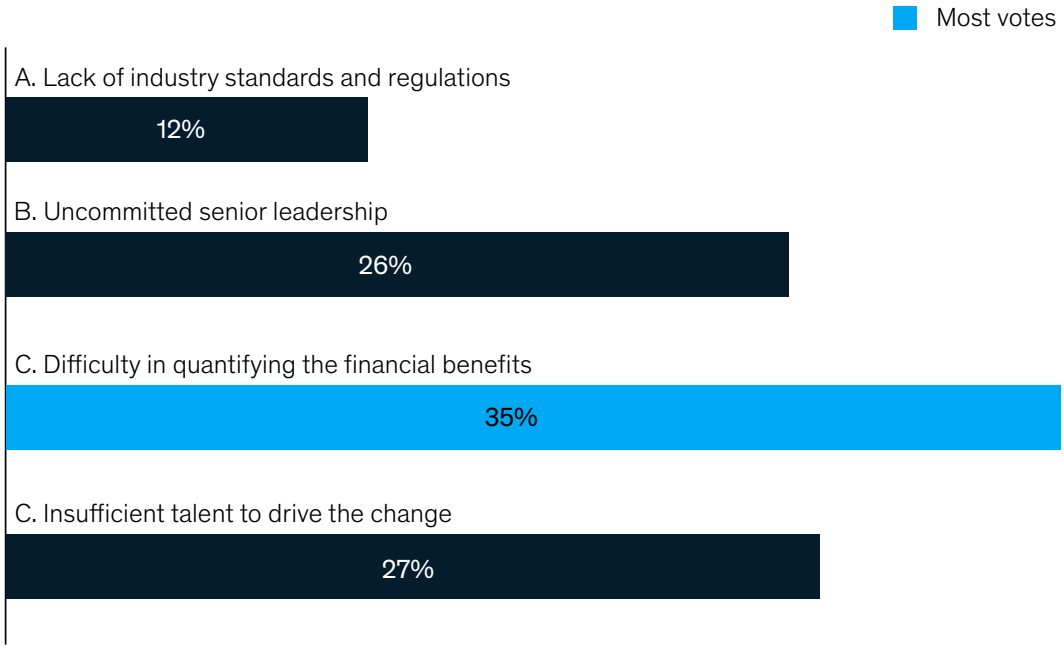
Digital analytics and transformation

While most infrastructure owners and contractors recognize the potential for digital transformation, there are few examples of successful transformations at scale. Too often, organizations fail to progress further than individual pilot projects. In a live poll of Summit participants, quantifying the financial benefits was cited as the biggest industry challenge to embracing technology, followed by insufficient talent and uncommitted senior leadership (Exhibit 2). When the same poll question was shared more broadly on LinkedIn, uncommitted leadership garnered the most votes. While there was no clear-cut referendum, it was agreed that the challenges to technology transformation are nuanced, interdependent, and broadly felt.

Use digital tools to improve collaboration and real-time information access across the value chain. The construction industry is highly fragmented and has been particularly resistant to changing its tools and processes. “To really see the benefits of technology adoption, we must transform the way we deliver projects,” said Marie-Claude Dumas, global director of major projects and programs at WSP. “Collaborative delivery models foster innovation during the design process, which is not the case in the design-build approach.” Key to success will be incorporating owner participation and use of technology throughout project design and delivery to ensure successful operations and maintenance. “Giving all

Exhibit 2

What is the biggest industry challenge with regard to organizations embracing technology?



stakeholders in the supply chain access to the information at the right time is much more efficient," Dumas said.

Create common digital platforms. Advanced analytics can uncover critical insights from the vast amounts of data already being collected, improving both the quality and speed of infrastructure delivery and operations. To optimize these results, it is vital for all players to be able to collaborate on common digital platforms and to explore shared digital-service business models. But rather than hoping for a single platform for all users, collaborators should instead focus on platform interoperability—a "platform of platforms." Similarly, firms should spend less on individual siloed features and solutions and instead invest in organization-wide platforms. The rise of affordable software leases aimed at smaller, often local infrastructure organizations is also promising. For all data-sharing arrangements, organizations need to be aware of legal and reputational risks.

Expand the use of digital-twin technology. The industry has seen a rise in the use of digital twins—digital representations of a process, asset, or system that are connected to the physical twin—during the pandemic as teams have been forced to learn new ways of working together remotely. Beyond being a stopgap, digital twins have become powerful tools for better understanding systems and anticipating problems before they occur, as well as for developing opportunities to inform future planning.[2] GE Canada CEO Heather Chalmers shared how digital-twin technology helped in the redesign of a hospital that was consolidating three different buildings: "Using digital-twin

[2] For more on the effect digital twins could have on the United Kingdom's infrastructure operations, see Mark Enzer, "Establishing the National Digital Twin: A Q&A with CDBB's Mark Enzer," McKinsey Global Infrastructure Initiative, September 2020, globalinfrastructureinitiative.com.

technology, we created a model of the new hospital and were able to show that nurses were going to have to walk double the steps a day in the new hospital, which is obviously not possible," Chalmers said. The resulting redesign saved 20 percent in "sneaker time" and millions of dollars in operations.

Prioritize solving for organizational culture. The main barrier to tech adoption tends to revolve around organizational culture, not the technology itself. Organizations investing in a data or software solution often lose sight of their goals as they focus in on particular tools or systems. To avoid this, there has to be an organization-wide understanding of the role digital solutions will play—not just a strategy statement from the CEO. A key part of that process is to break down silos to allow employees to see the organization-wide needs, rather than just the specific features and solutions they would find useful.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Collaborative project delivery

Collaboration was a consistent theme of the conversations throughout the Summit—as was the acknowledgment that collaborative project delivery can be a complex undertaking. Indeed, realizing collaborative project delivery requires certain conditions in place and a clear implementation road map. "I'm sure that every project can benefit from a collaborative approach—but collaboration also takes time and effort," said Tilly Chang, executive director of the San Francisco County Transportation Authority. At the center of a successful collaboration is the ability to resolve issues quickly—which requires a strong foundation of trust, skilled partners, and full accountability. "In construction, technology already enables and delivers productivity at an individual task level," said Trimble CEO Rob Painter. "Maximizing systemwide productivity requires engaging project owners in communicating and coordinating across the life-cycle continuum and aligning incentives to reward efficiency."

Not every project is a contender for collaboration; it takes a lot of time, process, and people. But for projects that otherwise couldn't happen, often due to the massive amount of funding needed, it's the best—and sometimes only—path forward.[3]

[3] For more on collaborative contracting best practices, see Jim Banaszak, Jeff Billows, Rudi Blankestijn, Matthieu Dussud, and Rebecka Pritchard, "Collaborative contracting: Moving from pilot to scale-up," McKinsey Global Infrastructure Initiative, September 2020, globalinfrastructureinitiative.com.

Install experienced leaders. Getting the right leaders appointed among all partners is a crucial starting point. "Both the construction and client sides need to hire leaders with the capacity for collaboration. It's a skill and an ability to understand and empathize with the other side. If you have that kind of person, half of the problems are already solved," said Aecon Group Chairman John Beck. In reality, there are only a handful of people in the world with the skill set to pull off a major collaborative project—so one thing the industry could do to expand the promise of collaboration is to build out the pool of qualified leaders. "We have to figure out as an industry, how do we train and develop people to be equipped to go out and make the judgments and decisions that make project success for all?" said ALEC CEO Kez Taylor.

Choose partners wisely. At all levels of the partnership, transparency and accountability are key, with team members committed to facing challenges and problems squarely when they happen. That's why a successful collaboration is founded on trust, and partners can expect fair play, timely responses, and competent team members. Supportive behaviors include being action-oriented and knowledgeable, making good decisions, resolving issues quickly, communicating effectively, minimizing disputes, and appreciating all stakeholders that are part of delivering the project successfully.

Set expectations and terms in an initial "group therapy" session. To establish the trust needed for a successful collaboration, leaders likened the initial meeting to a group therapy session. Collaborators can establish charters and memorandums of understanding that define outcomes, accountability, and roles, as well as lay the ground rules for how to address risks and resolve issues quickly and efficiently. In one example, two partners were using the same word but with different meanings, which led to confusion and conflict. To resolve this, they sat down and worked out a glossary of definitions, reconciling language across cultures.

Maintain a symmetry of knowledge. As the project unfolds, collaborators will want to do everything they can to maintain clear communication—what participants dubbed "a symmetry of knowledge." While technology can't solve fundamental challenges of collaboration, increasingly it can be used to help provide the sort of communication and transparency that helps maintain trust and accountability. On-site documentation in real time enables parties to catch issues as they happen, before they get layered over, and provide a transparent trigger for the responsible party to fix the issue.

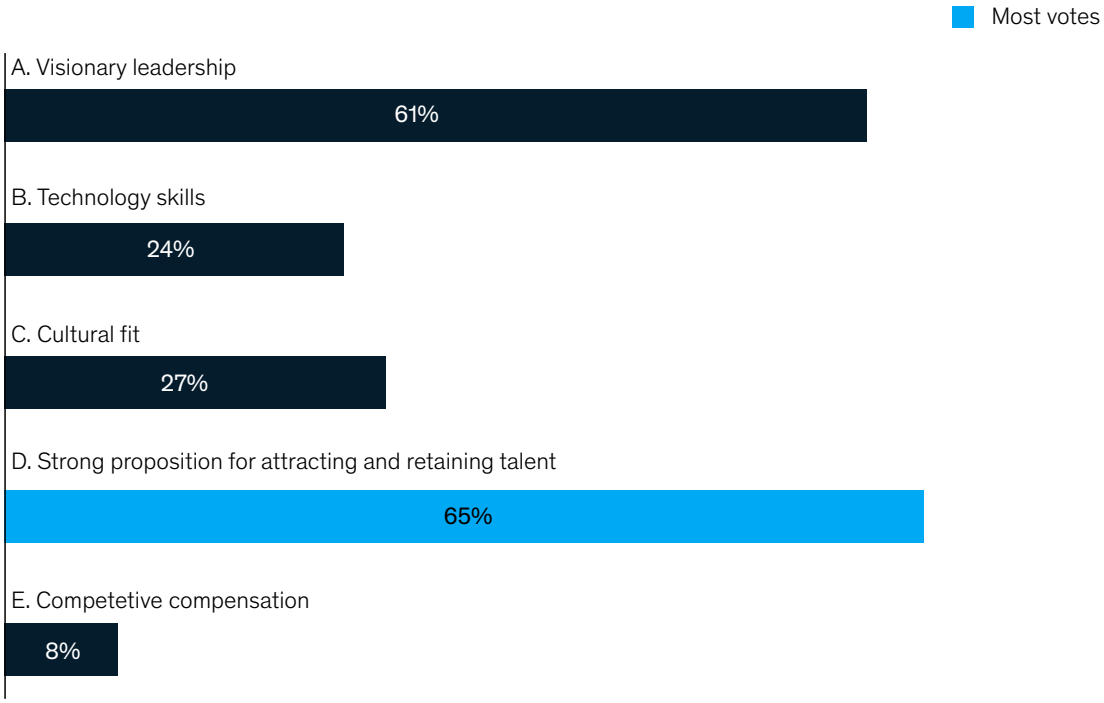
Leadership and workforce development

Shifts in digitization, industrialization, and consolidation are transforming the industry, requiring a renewed focus on leadership, culture, organizational structure, and talent. Infrastructure leaders are acutely aware that delivering and operating the projects of the future requires developing a workforce with skills and capabilities that are up for the job. The key question is: how do you go about doing that? In a live poll of Summit participants, the top two factors that respondents believe will play the greatest role in developing the right workforce for the future are visionary leadership and a strong proposition for attracting and retaining talent (Exhibit 3).

Attract and retain talent by communicating the industry's role in society and organizational values. The industry can appeal to the next generation of the workforce by emphasizing the critical role that infrastructure plays in addressing challenges such as climate change, social equity, and diversity and inclusion. "[Sustainable solutions are] an important element of engagement for our staff and for the next generation of talent coming into the organization," said AECOM President Lara Poloni. "This makes it a huge factor in terms of retention and in providing the talent supply that we need to address the infrastructure challenges."

Exhibit 3

Which two factors will play the greatest role in delivering the right workforce for the future?



"We really have to do a better job of evolving the value proposition, which is going to be much more focused on mission," said Massachusetts Port Authority CEO Lisa Wieland. Frequent, consistent communication with employees (and potential employees) about the organization's purpose-led mission can dramatically improve employee satisfaction and engagement. Organizations can also pay special attention to how their website and social-networking content is curated to appeal to younger generations.

Ewan Drummond, senior vice president at BP, described the impact on recruiting of broadening the company's portfolio to include offshore wind, biofuels, and carbon capture and utilization.

Prioritize skills that will define the infrastructure of the future. It's a given that employees are going to need to be more analytical so organizations can shift from experience-based decision making to data-driven decision making. In addition, competence in the areas of biodiversity impact and off-site production are also top of mind for leaders as hallmarks of the workforce of the future. These capabilities will enable players to deliver capital projects more quickly, safely, and efficiently.[4]

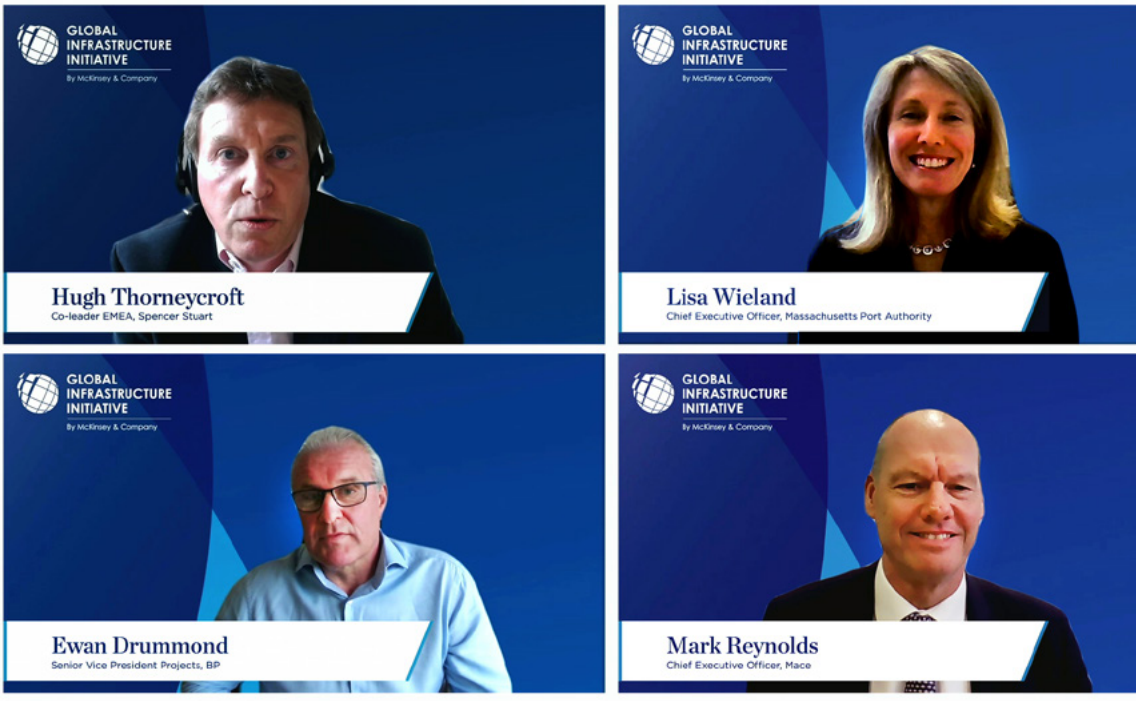
An emphasis on cultivating "soft skills" will be critical for all levels, from the front line to management. "On the customer front, we need strong communication and collaboration skills. Employees of the future are going to need to be able to be responsive to evolving customer needs in ways they haven't had to before," Wieland said.

[4] For more on the potential of modularization to transform infrastructure construction, see "Scaling modular construction," *Voices*, McKinsey Global Institute, September 2019 edition, globalinfrastructureinitiative.com.

Build more robust options for career routes through construction. In 2017, the McKinsey Global Institute estimated that up to 375 million workers—which represents 14 percent of the global workforce—will need to transition to different occupational categories by 2030.[5] In the wake of the pandemic, that estimate has increased by 25 percent.[6] In addition to working with governments to build more robust training programs, there is opportunity to leverage the similarities with other industries, such as aerospace, to attract people with transferable skills—which also offers the opportunity to lure disrupters away from other industries. "In the United Kingdom, we have more people applying to work in the construction sector than we take on through apprenticeships and graduates in bursary every year," said Mace CEO Mark Reynolds. "So, I don't actually think a dearth of talent is the issue. We just need to give them a chance."

Embrace hybrid and collaborative working models. Infrastructure leaders noted how the lockdowns forced teams to get creative in adjusting business as usual to fit a remote working model. In many cases, it became an opportunity to establish hybrid working models that are better and more productive than they were before the pandemic. "Collaboration's been at the heart of many of our contract models," said HS2 CEO Mark Thurston. "Men and women have come together and found a way of working together despite the constraints of COVID."

Imagining the workspace postpandemic has raised some interesting questions on how much on-site human interaction is required. There is little to no flexibility with many construction roles, but it may make more sense (and result in correlating cost benefits) to keep certain work activities and engagements online. Cost benefits also extend to not having to travel and lose workdays to reach a client site when the current work model has shown equal effectiveness by collaborating with online tools. Companies are realizing the benefits the pandemic work model revealed; however, many C-suite leaders have expressed a preference of having in-person work interactions at sites.



[5] "Jobs lost, jobs gained: Workforce transitions in a time of automation," McKinsey Global Institute, December 17, 2017, McKinsey.com.
[6] "The future of work after COVID-19," McKinsey Global Institute, February 18, 2021, McKinsey.com.

Joy Real/Unsplash

Future-proofing infrastructure

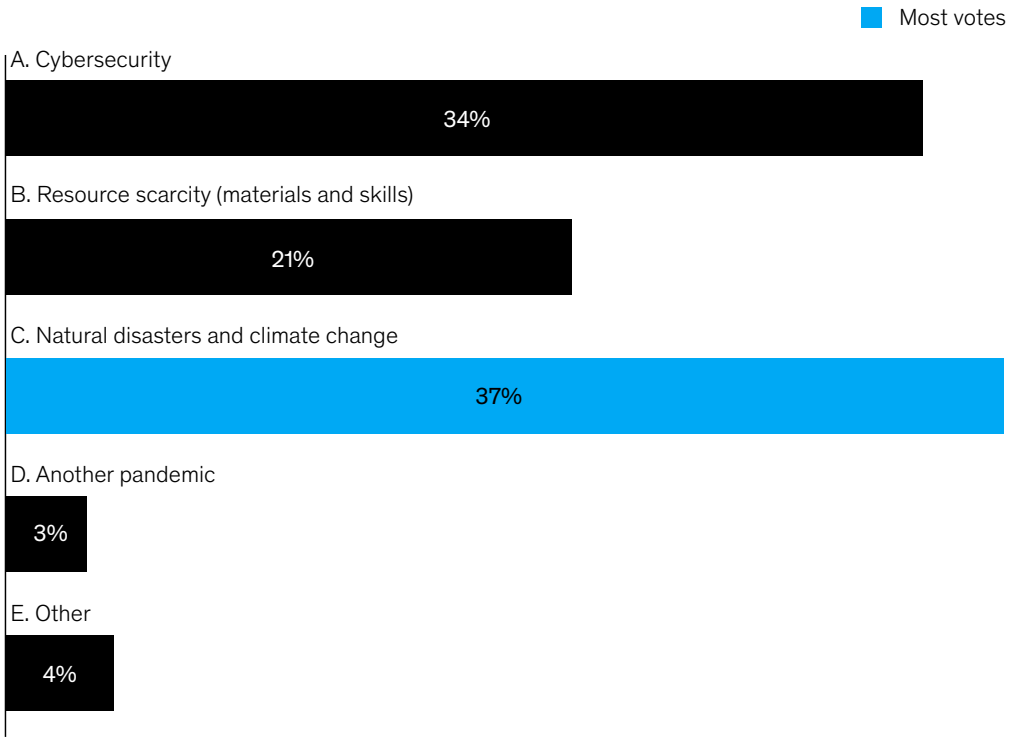
Global leaders are increasingly aware that the delivery and management of critical assets must include robust resilience and risk-reduction planning, accounting for cybersecurity, resource scarcity, inequity, natural disasters, and extreme weather events. According to a live poll of participants during the Summit, the top two risks facing asset management over the next 30 years are climate change and cybersecurity (Exhibit 4). Indeed, over the past decade, storm events have cost the world nearly $2 trillion and impacted almost four billion people, and the frequency and severity of these events will increase due to climate change.

Build climate change resilience into infrastructure through risk-informed decision making. Sea-level rise, floods, droughts, and wildfires all pose major risks to infrastructure, creating new constraints for the design of future infrastructure and new adaptation needs for existing infrastructure.[7] The large amount of climate information and resilience-planning tools now available can more consistently and effectively inform decision making, from multinational target setting to national infrastructure plans to individual projects. Doing so will support the shift from being reactive to proactive in mitigating climate-related events, while integrating preventive and predictive maintenance that is informed by science.

[7] For more on what the industry needs to do to build resilience to climate events, see Brodie Boland, Peter Cooper, Kimberly Henderson, Rob Palter, and Jonathan Woetzel, "Beyond taller walls: Meeting the resilience challenge of climate risk," McKinsey Global Infrastructure Initiative, September 2020, globalinfrastructureinitiative.com.

Exhibit 4

The biggest risk to asset management over the next 30 years is ...



Note: Figures may not sum to 100%, because of rounding.

The starting point is making risk-informed decisions on which existing facilities to rehab and where to build new ones—and, crucially, whether the proper measures are available to maintain those facilities. The US Army's approach is to rate and rank each facility based on not only the shape it is in but also the importance of the facility to the mission, and then determine the funding needed to get it to the top rating. "And unfortunately, this is not just a ten-year process," said Christine Altendorf, director of military programs at the US Army Corps of Engineers. "We have thousands of facilities, many in substandard state as related to energy efficiency and resiliency, and because of limited dollars, it will take many decades to get them where they need to be. Also, there must be a simultaneous commitment to maintain the facilities. The first thing we're trying to do is have a comprehensive analysis of the condition of the facilities and then define the path forward based on funding available."

Use technology and nature to develop climate-intelligent projects. A promising strategy is to identify and use technology solutions, low-carbon materials, biomimicry (for example, taking advantage of mangroves to manage erosion), and material reuse on projects to create lasting assets that have minimal negative biodiversity and community impacts. Additionally, external costs (in line with broader ESG reporting) could be considered to provide a more comprehensive view of total cost of ownership, including potential societal benefits and costs. Governments have a role to inform capital and markets to drive intelligent solutions by establishing standard reporting guidelines and structures.

Increase investments in cyber resilience. Given the reliance on outmoded technology, as well as the integration of new technology into critical infrastructure, cyber resilience is a clear priority. As institutions look to augment, replace, or upgrade their current technology

infrastructure, cybersecurity is at the forefront of concerns to address. The race to adopt new technologies coincides with shifting geopolitics that, in addition to affecting trade financing and supply chains, have also led to the increased use of ransomware and attacks.

In particular, owners and operators should be concerned about zero-day exploits—that is, cyberattacks that occur the same day a vulnerability is discovered by a hacker, making it unlikely the entity being attacked knows of the threat. "Those are being sold right and left around the world these days," said Parsons Chairman and CEO Charles Harrington. "The more we automate and digitize our infrastructure—unfortunately—the higher the risk will come. The investments in cyber resiliency really, really must increase." Human error is another common vulnerability that has led to everything from Ukraine's entire grid being brought down to the hacking of Florida's water system. And recovery can cost billions of dollars.

Reconsider your resources—from materials to workforce. The pandemic shined a spotlight on the shortcomings of asset managers' resources. In fact, some participants reported that the primary reason for work halts was not due to COVID-19 cases among their workforce but disrupted access to the resources—materials or specialized skills—they needed to do the necessary work on everything from climate change resilience to cybersecurity. Half of approximately 1,500 respondents to a March 2021 survey by the Associated General Contractors of America said they lacked construction materials, equipment, or parts to avoid project delays, and around one-third said they were facing a shortage of craftworkers and subcontractors.[8] The increasing focus on addressing climate change is also pushing more discussion of whether those materials are sustainable and energy efficient. As for workforce, "What we're finding more and more—especially with new control systems and smart building designs that aid in energy efficiency and resiliency—is that we don't have the skilled laborers who are trained appropriately to do what is necessary to keep the systems up and running with new technologies," Altendorf said.

[8] "March 2021 Coronavirus Survey Results," Associated General Contractors of America, March 11, 2021, agc.org.

Marc Olivier Jodoin / Unsplash

Using infrastructure investment for economic recovery

Investing in infrastructure is a critical tool to create jobs, drive economic recovery, and position our economies for sustainable growth. During the Summit keynote discussion, Canadian Minister of Infrastructure and Communities Catherine McKenna described how Canada is working to invest in infrastructure to address a host of challenges, including fighting climate change and building equitable, inclusive communities. “Every investment decision we make has to help us plot the path to net-zero emissions. And investment in infrastructure in indigenous communities is also a top priority. Everything we’re investing in has to get multiple outcomes from every dollar spent—especially when it’s taxpayer dollars—and position us for the future we want, the communities we want, and the country we want,” said McKenna.

Like so many other trends, the COVID-19 pandemic has accelerated the trend toward an energy transition. “Climate change is one of the biggest investment opportunities in decades—probably the biggest after private equity and technology in the past 20 or 30 years,” said CDPQ President and CEO Charles Emond.

Summit participants discussed *how* stakeholders can provide more long-term stability and visibility to infrastructure pipelines to unleash public- and private-sector investment in infrastructure and get the resulting economic and environmental benefits.

Take a long-term view to ensure an inclusive, sustainable recovery. Over the past year, companies and governments alike have been making bold moves to set decarbonization plans and pursue sustainable solutions. But now is not the time for short-term thinking: the challenge and the opportunity for governments and the private sector going forward will be to take an even broader perspective of the projects that make it to the top of the infrastructure priority list, with consideration for broader economic benefits, social implications, and environmental effects.

And it's a worthwhile investment: technology and the ability to drive down costs have meant projects can get attractive returns on a risk-adjusted basis. Project owners and investors are rapidly expanding their project-sustainability criteria to include Scope 1, 2, and 3[9] emissions. "Portfolio companies and management of these companies themselves are very excited to [reduce those emissions]," said I Squared Chairman and Managing Partner Sadek Wahba. "And many have been able to do it in a cost-effective way that is accretive to the business."

Build the regulatory framework required to support and encourage private capital. Private-sector participation in infrastructure requires building pathways to include long-term, stable funding for projects and sufficient financing. "The challenge is not the supply of capital, as two-thirds of investors around the world plan to increase their allocation in this asset class by 2025," said Emond. However, investors want to go where regulatory and concession frameworks are predictable, with a visible pipeline of bankable projects. Therefore, governments can consider how best to demonstrate a sizable pool of opportunities with a stable set of rules to promote the right environment and make room for private investment. "That's what investors factor in when we make decisions as to how much

[9]Scope 1, 2, and 3 emissions cover direct emissions from owned or controlled sources; indirect emissions from the generation of purchased electricity, steam, heating and cooling; and all other indirect emissions that occur in a company's value chain, respectively.

capital we will deploy, which country we'll prioritize, and how big of a team we actually need on the ground," Emond said.

Establish long-term funding mechanisms and a national infrastructure bank. New long-term funding mechanisms could help governments and others to invest through ups and downs in infrastructure—not over two to three years but decades. Encouraging state pension funds to invest in infrastructure and creating new sources of capital, such as through the option to invest personal retirement-account funds in infrastructure assets, could open a world of possibility. Countries such as Australia, Canada, and the United Kingdom have found success in identifying and managing such projects through national infrastructure banks—government-sponsored entities that are run independently and have the ability over a long period of time to deploy that capital.

Provide technical assistance to subnational governments. Building and operating infrastructure often requires the involvement and cooperation of national, state, and local governments. The United States, for example, has more than 38,000 general-purpose governments at the county, town, and village levels, and more than 51,000 special districts (including school districts).[10] Many of these subnational governments lack the resources—including both skills and capital—to embark on large capital projects. In such cases, the national (or state or provincial) government can establish a technical assistance program to provide expertise and support to localities charged with participating in or directing large, complex infrastructure projects. Doing so could move local governments to embrace such projects and also make them more attractive to private investors.

[10] "2017 Census of Governments—Organization," United States Census Bureau, February 12, 2020, census.gov.

Daniel Baylis/Unsplash

Montréal site visits

Innovation Site Visits have been central to GII's solutions-focused approach, exposing leaders in the GII community to some of the most exciting developments in infrastructure from around the world. Integral to this GII Summit program were three virtual infrastructure site visits, allowing participants to see firsthand how infrastructure is planned, financed, delivered, and operated at some of Montréal's leading major projects. The purpose was to spark conversation around actionable insights from the project that leaders can then apply to their own projects and in their own organizations.

This year, participants could choose to visit one of three sites in Montréal: the Réseau express métropolitain (REM), the Samuel De Champlain Bridge, or the Turcot Project.

Réseau express métropolitain

Réseau express métropolitain (REM)—a new, 67-kilometer integrated public transit network under construction in Greater Montréal—is the largest public transit project undertaken in Québec in the past 50 years. The fully automated electric light rail network will feature 26 stations and link downtown Montréal, universities, South Shore, West Island, North Shore, and Montréal–Trudeau airport. CDPQ Infra's approach to this megaproject has resulted in a six-year timeline from conception through first operation.

The site visit highlighted two primary success factors: the quality of the project team and the importance of public buy-in. On the latter, the project's consultation phase involved more than 300 meetings with stakeholders, from public officials to local residents, and the messaging around the project consistently communicated both the benefits and the risks to all stakeholders. Managing social acceptability is a constant challenge for this type of project, especially for the REM, which crosses a total of 18 municipalities and boroughs. The growing number of stakeholders and issues addressed is significant and must be monitored and managed on a daily basis, in both the planning and implementation phases.

It also reinforced two well-worn truths: whatever you do to minimize the risks, there will always be some that you haven't anticipated; and whatever the standards are in terms of schedule, you can always do better. The teams working on the REM's construction are currently dealing with a number of challenges, especially with respect to the century-old Mount Royal Tunnel, which was in a more advanced state of degradation than expected, and the entire period of testing and preparation for the commissioning of the southern portion of the route, which is scheduled for 2022.

To manage these challenges and risks on a day-to-day basis, CDPQ Infra's business model requires flexibility at every stage of the project. This flexibility is characterized by a rapid and efficient mobilization of the team's diverse expertise, which is put to use in every project phase—planning, execution, and operation.

For more details, watch this short video.

Rendering credit: Infrastructure Canada

Samuel De Champlain Bridge

The Samuel De Champlain Bridge is a 3.4-kilometer twin cable-stayed bridge spanning the Saint Lawrence River between the Island of Montréal and the South Shore suburbs. Replacing the 57-year-old original, the new bridge's two-lane rail corridor for the REM, six-lane corridor for vehicles, and multiuse corridor for cyclists and pedestrians are expected to serve 40 million to 60 million vehicles annually for the next 125 years.

This complex project was completed in only four years by employing modern construction technologies and methods, namely modularization. The bridge was built using more than 10,000 components, including 1,000 oversized pieces of concrete and steel weighing hundreds of tons each. Success required up-front incorporation of modular elements in design criteria, rigorous supply chain management, and state-of-the-art quality assurance and quality-control technologies.

It was also made possible by securing up-front capital investment by the designer or builder, as well as the integration of operations and maintenance with project-execution tasks. Extensive use of digital technologies improved the project team's productivity by enabling a full asset life-cycle approach during design and enhanced quality control. While the public–private partnership model that this project used proved successful, the team advised that future project teams should look for opportunities to distribute execution risks as evenly as possible between all stakeholders.

For more details, watch this short video.

Turcot Project

The Turcot Interchange connects three major highways and serves more than 300,000 vehicles per day. This ten-year project has replaced 145 kilometers of four interchanges and relocated the nearby Canadian National railway tracks, all while minimizing user disruption. As it nears completion, the logistically and technically complex project is still running on time and on budget.

The project is a reminder of several themes in revolutionizing project delivery. To start, technology is a key enabler to delivering complex construction projects faster, safer, and with more certainty of outcome—and in the design–construction sector, adoption is just starting. Moreover, the private sector, when properly enabled, can find innovative solutions to reduce project schedules, risks, and costs through innovation and out-of-the-box solutions. Of course, collaboration, communication, and transparency between all parties involved—including owners, third-party stakeholders, and the delivery team—is critical.

The Turcot Interchange project team adopted a "one-team" approach that has been vital to success. All parties aligned on the big picture and were encouraged to make decisions at the appropriate times and for the best interest of the project to ensure project success. Finally, the interchange project is a reminder that renewing infrastructure is an opportunity to impact carbon emissions, the urban environment, and public health.

For more details, watch this short video.

Photo courtesy of KPH Turcot / Air Photo

Martin Reisch/Unsplash

Sector roundtables

GII places a premium on solution-focused conversations that help to identify tangible actions that participants can take back and apply to their respective projects and organizations. To this end, the 2021 virtual Summit concluded with six sector roundtables, allowing participants to do a deep dive into their chosen sector.

Engineering, construction, and building materials: Decarbonizing the construction industry

The construction industry—encompassing real estate, infrastructure, and industrial structures—is the largest industry in the global economy and accounts for 13 percent of the world's GDP. Due to its size and impact, this entire ecosystem has a major part to play in decarbonization and achieving sustainability goals. Participants in the engineering, construction, and building materials roundtable discussed several key actions the industry will need to take to meet industry sustainability goals:

Expand decarbonization efforts beyond operations to encompass design and construction. While there is industry awareness of how buildings can be designed to reduce carbon emissions from their operation, there needs to be a greater focus on the emissions involved in building the

structure. This requires reexamining the materials used to create the structure, the power sources used during construction, and the size and purpose of the building itself. Indeed, "embodied carbon" from the materials used can make up a significant portion of a building's overall emissions.

Contractors and suppliers can work together to ensure transparency into the environmental costs of construction materials and allow customers to make informed decisions about the carbon impact of a project. Tools such as the Embodied Carbon in Construction Calculator (EC3) can make this process quick and easy. Using lower-carbon materials does not necessarily mean different or more expensive materials because the circular economy can provide traditional construction materials with much lower embodied carbon. And new technology, such as digital twins, can help plan new builds more effectively as well as help identify opportunities to optimize existing buildings.

Collaborate across the value chain and sectors. Understanding and effectively acting on carbon emissions involves transparent communication, shared data, and aligned incentives among organizations across the value chain. Collaborative contracting, as well as the establishment of industry-wide environmental benchmarks and standards, will help drive progress. The industry can also do a better job of future-scanning (for example, offshore wind or hydrogen) to determine the opportunities, invest in research, and use technology to de-risk new investments.

Direct COVID-19-era stimulus toward decarbonization. Most stimulus packages feature large projects with stringent environmental requirements, as well as considerable funding for renovation and retrofitting—which will be a huge component of decarbonization efforts in the near future. For example, the European Commission (EC) has introduced a Europe-wide taxonomy that determines whether a construction project can receive EC funding. This, along with more traditional subsidies and regulations, could be a model for government action in the future.

Establish your organization as a leader in decarbonization. ROI can be hard to define for decarbonization efforts today, but the industry nonetheless is shifting toward decarbonization. While there is growing awareness of environmental issues, there is not yet a strong customer demand for low-carbon buildings. This could be an opportunity to educate clients and establish a strong brand identity as a low-carbon player in the industry. Construction site safety may be a useful analogy: nowadays, a robust safety culture is a prerequisite for many contracts. Similarly, the growing importance of decarbonization to governments globally could result in a robust decarbonization strategy being a license to operate.

Energy and resources: Reinventing capital project delivery

Over the past two decades, leading industries have decreased the cost and time of delivery by changing how they operate. Applying the same underlying principles to large capital projects in energy and resources could achieve a similar step change in performance, with the potential to reduce actual project cost and time by 30 to 50 percent. Participants in the energy and resources roundtable discussed several key actions the industry will need to take to reinvent capital project delivery:

Use computing power to drive change in design and operation. Only recently have computers been able to process the inherent complexity of major project design and delivery. For example, Sterlite Power has developed a 40-layer gas-insulated switchgear algorithm that routes its transmission lines along paths with the highest returns, lowest risk, and highest likelihood to get built on schedule. Enel, one of the largest privately owned operators of electricity distribution networks, mounted a complete cloud transformation of its distribution customer operations that has reduced operating costs by 30 percent. René Morkos, CEO of ALICE Technologies, predicted that the future of project delivery will be defined by 30 to 50 companies active today. In that future ecosystem, built on data, success will be defined by a company's ability to identify, evaluate, and implement cutting-edge technologies. Knowing who is building what, where, and when will be how companies win a decade from now.

Invest in upskilling and reskilling the workforce, including building out soft skills. It will take a concerted effort from governments, academia, and industry players to supply the labor needs of the future construction industry. In the United Kingdom, these three groups are taking a long-term perspective and trying to address issues in procurement, capital focus, fragmentation, and attracting and retaining talent for digital construction. Stakeholders will also need to update construction training programs to include the soft skills of stakeholder management, a lack of which often leads to project delays when communities don't receive effective communication and therefore resist projects in their backyards. Investing real resources in training an entire workforce, not just communications experts, to think about the social aspects and communicate effectively with stakeholders will create on-the-ground results.

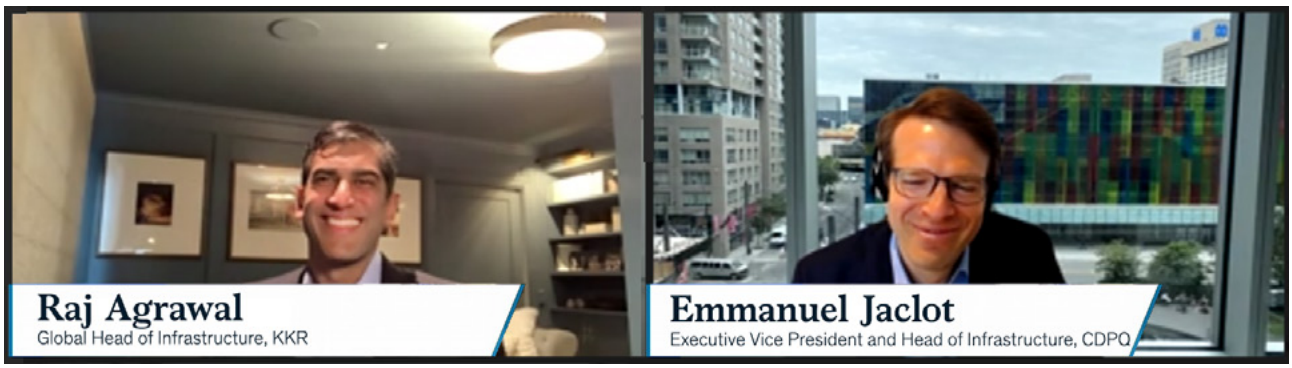
Encourage innovation by using relational contracts and offering flexibility in specifications. Traditional siloed contracting is combative and transactional, often leading to an inability to be bold as all parties operate in fear of failure. Introducing relational contracts allows parties to develop trust, align incentives, and introduce innovative methods on project delivery. Furthermore, regulators, inspectors, and other stakeholders may stifle innovation with overly prescriptive specifications, despite alternative options. This unnecessary pathway can create barriers to innovation and increase cost.

Infrastructure investment: Investing in infrastructure in a net-zero reality

With countries and companies committing to achieve net-zero carbon emissions by 2050 or earlier, there is an urgent need to invest to meet both the regulatory and corporate commitments. Shareholder commitments to net-zero targets and consumers' demands for low-carbon infrastucture services are putting additional pressure on investors, operators, and asset owners to transition their infrastructure to de-risk their asset base and supply chains and to invest in emerging decarbonization infrastructure. As a result, the industry is seeing significant investment into clean energy, water and waste efficiency, digitization, electric vehicles, and more. Participants in the infrastructure investment roundtable discussed several key actions for investors and governments to enable the net-zero infrastructure opportunity:

Commit, get creative, and communicate. To reach net-zero by 2050 requires clear institutional commitments from infrastructure-asset owners and investors—not just window dressing. Transitioning a portfolio to achieve net-zero objectives involves a series of strategic, operational, and financial decisions that will include exiting carbon-intensive assets but also investing in decarbonizing assets, moving infrastructure from "brown to green," and investing in new technologies, business models, and solutions. To be successful in this transition, the exchange of insights will be essential. Creating opportunities to shape and deploy infrastructure and procurement solutions and communicate best practices between investors, owners, and governments is a critical part of catalyzing progress toward reaching net-zero 2050 goals. Throwing money at the problem won't work; it will also be important for governments to provide strategic capital solutions to de-risk and scale best practices.

Use meaningful, consistent metrics to promote accountability and tie investment to impact. Increasingly, infrastructure investors require carbon-footprint metrics from companies to assess their value in investment portfolios, and companies' financial risk managers incorporate climate-related key performance indicators to ensure that net-zero targets are met. "We wouldn't be serving our customers today without evolving how we do business. The market demands it,"



said Raj Agrawal, the global head of infrastructure at private-equity firm KKR. Increased demand for transparency on carbon emissions, paired with the felt impacts of climate change, is requiring organizations to not only evaluate their portfolios but also establish their own targets, reporting, and incentive programs aligned with a successful transition. "You need to change the mindset of investment teams," said CDPQ Executive Vice President and Head of Infrastructure Emmanuel Jaclot. "To actually work, the approach needs to be quantifiable and auditable, or it won't stick." Indeed, using jolting metrics to convey the reality of not meeting low carbon-emission targets has become a powerful tool in inciting change; investors such as CDPQ include climate targets in employees' variable compensation.

Improve regulations and guidelines. Governments can also play a bigger and more active role in increasing transparency and consistency by providing better guidelines and oversight, incorporating resilience and emissions into asset-management targets, and measuring performance. "Good regulation is key: an investable regulatory framework for energy transition projects can lead to rapid development, and clear ESG disclosure standards can improve comparability," said Clare Burgess, a partner at Clifford Chance.

Look for ways to mitigate the risk of deploying capital at scale. Coal and oil are not the appealing investments that they once were, and while the largest at-scale green infrastructure market today is renewables, it's not necessarily the most profitable. Decarbonization investments are attractive now, not just because investing in these projects is considered the right thing to do but also because the market demands it. The advent of green hydrogen production has presented exciting opportunities for decarbonization in the gas sector. However, investing in these technologies poses a set of technology, regulatory, and new business model risks that infrastructure investors and operators, as well as shareholders, are not accustomed to taking. New capabilities will be required to understand and mitigate these risks with structured solutions—an area in which governments can play an active role by identifying and buying down the risks impeding capital from testing and implementing decarbonization infrastructure solutions at scale.

Take a long-term view. The question of where to commit infrastructure funding to build for the future does not have a simple answer. "If you look at the infrastructure requirements of the world and individual countries in ten years' time, they will look rather different from the actual infrastructure that is in place now," said Michael McGhee, a founding partner of Global Infrastructure Partners. "It has become a lot tougher than it was even ten years ago when we felt things were easier to predict." Clearly, the path is paved for investment in renewables, but future priorities will be shaped by success stories that are still emerging.

Real estate: Resetting real estate post-COVID-19

Real estate has arguably been one of the industrial sectors hit hardest by COVID-19, with occupancies in certain assets dropping by up to 90 percent at the height of the crisis. More than a year into the pandemic, physical distancing and lockdowns continue to limit peoples' ability to access physical space, and working from home has become the norm for large parts of the economy. The convergence of technology, workplace, and workforce policy is enabling real estate leaders to deploy a broader set of tools to measure more than cost and maximize the productivity of users. Participants in the Summit's real estate roundtable discussed several key actions the industry will need to take to reset post-COVID-19:

Prepare for an uneven recovery and varying needs. Asset classes have been hit differently by COVID-19, and for some—such as data centers, life sciences, and logistics—there has been little to no negative impact. And development of certain types of real estate projects, such as warehouses, continued through COVID-19 with enhanced safety measures on the job site. However, other types of development, such as offices, are not being built without precommitment from occupiers. Cities have also been affected differently—some have experienced an outflow of people, while others have seen inflow. These varying impacts mean that the recovery will look different across asset classes, projects, and geographies. Because the industry is in tremendous upheaval, there are many assets that are available for investment and can be transitioned to new uses.


Justin Bisson Beck/Unsplash

Adjust to peoples' changing needs and behaviors postpandemic. After the pandemic, people will behave differently, in everything from their work to shopping and beyond. Office real estate will need to focus on high-value collaboration to attract people back into the space. To that end, the effects of COVID-19 have shown that it is possible for companies to operate successfully with flexible and hybrid working arrangements. Employers can no longer expect employees to commute to the office every weekday. Real estate and work models will need to reflect this new social contract between employer and employee. Municipal governments will also need to find ways to make people feel safe while commuting and being physically present in public spaces.

Prioritize placemaking as a means to entice people back into real estate. The high-end real estate on London's Regent Street is enlivened by Piccadilly Circus, Oxford Circus, and all the people that move up and down the street on a normal day. This is true around the world, and cities will need to work with real estate owners to ensure that placemaking resumes post-COVID-19 to make both the place and the real estate attractive and to entice people to return and make them feel safe.

Lean into technology as a vital enabler of progress. Compared with even five years ago, the real estate industry has rapidly accelerated its adoption of technology—particularly in using data to make decisions about space usage. Going forward, players will continue to expand their use of technology in development and operations through automated design, building information modeling, modularity, 3-D printing, real-time occupancy tracking, user experience applications, and building automation systems to bend the productivity curve.

Transport: Reimagining transit in a post-COVID-19 world

Over the past few decades, urban mobility has seen significant challenges—the rising growth of cities, changing user preferences, decarbonization imperatives—and fiscal constraints. The COVID-19 pandemic has compounded these challenges for transit operators; ridership and fare revenue have declined sharply, thereby imperiling their economic viability. However, public transit will be vital to recovery from COVID-19. "Public transit is the only way to deal with traffic jams and climate change and is needed to enable inclusive, green, and fair growth," said Marie-Ange Debon, group CEO of Keolis.

There are five imperatives for customer experience in a reimagined public-transit system post-COVID-19: a step change in service reliability, visible emphasis on cleanliness and safety, true digital interaction and tools, innovative ticketing and fares for new customer usage patterns, and personalization to know individual customers. Participants in the Summit's transport roundtable discussed several key actions the industry can take to reimagine urban transit in a postpandemic world:

Reimagine the public transit business model, deploying a surgical focus on user experience with increased operational and capital efficiency. "We have to redesign our business model to make our industry sustainable from an economical and financial point of view—through a more flexible and personalized offer to improve the efficiency of our operative processes and through technological innovation—in order to make the use of passenger transit more attractive and effective," said Arrigo Giana, the CEO of Azienda Trasporti Milanesi.

Riders will also expect a better experience. This will require significant technological innovations, data-driven user experience improvements, and a more agile operating system. Revenue levels will likely remain depressed for the next 12 to 18 months, which will drive a strong need for increasing efficiency. However, efficiency can't lead to operating cuts that launch a "downward spiral" of user experience, thus magnifying the challenge even further. "I am optimistic that the pandemic will cause positive change and push us to become more efficient and effective in decision making, with a better understanding of our customers," said MetrôRio President Guilherme Ramalho.

Collaborate across established and new urban mobility modes to increase public transit's competitiveness. Better integration of existing urban transit services with new mobility modes (for example, rideshare) is seen as a critical enabler of achieving better coverage for user origins and destinations (especially for first and last mile), as well as user experience. At a minimum, this integration should cover ticketing and information. It is also seen as a cost-effective way to implement change quickly and without needing to commit capital or future operating costs in a time of uncertainty. "Transport on demand" offers the opportunity to become less dependent on built infrastructure and react agilely to changing customer demand. According to Uber's head of transit, David Reich, "The pandemic has accelerated our already strong collaboration with cities as we work together to leverage technology and on-demand transportation to help transit systems become more efficient, equitable, and connected."

Tokyo offers a successful example of such integration: faced with a large number of transport operators in the city, Tokyo Metro launched a mobility-as-a-service (MaaS) initiative with a mobile app to integrate multiple transportation modes while linking to various destination services. Indeed, scaling in the new transportation economy requires an accentuating focus on increasing the value of the ecosystem, not just that of one's own role in it.

To restore trust in transit infrastructure, assimilate the lessons of the pandemic. COVID-19 obviously hit transit and airline ridership hard, and to date, it's only partially recovered. Infrastructure owners and operators are adapting to new—and likely permanent—concerns over safe and healthy travel. Technology, among other measures such as regular disinfection, will be crucial to restore confidence and offset the cost increase. For example, Moscow Metro actively implemented a series of highly visible initiatives to ensure passengers' awareness of safety protocols, including daily disinfection of trains and stations. Riders will expect that these measures will be ubiquitous across all modes of travel. That will put the focus on equitable access to transit infrastructure—a key tenet of building more inclusive communities.

Act now. Time is of the essence to reset public transit for the postpandemic future. As pandemic restrictions are beginning to ease, transport should expect a bias for the use of individual mobility solutions. Winning customers back, ensuring prudent use of stimulus funds earmarked for transit-infrastructure projects, and shaping collaborations with new mobility modes should be top priorities for public transit over the next six to 12 months to ensure the successful future for public transit that our societies need.

Urban mobility: Developing the infrastructure to quadruple the number of electric vehicles by 2025

Driven by policy, subsidies, and expanded consumer choice, the global electric vehicle (EV) market has seen incredible growth over the past decade, reaching a global fleet of more than 11 million vehicles in 2020. However, EV infrastructure continues to be a bottleneck, with the majority of the 7.3 million chargers (in 2019) being private, light-duty vehicle slow chargers. Furthermore, the path forward depends heavily on geography. For example, Europe's EV landscape is more fragmented than that of the United States, due primarily to the autonomy of countries and the larger cadre of charging providers, both of which are barriers to quick progress. Meanwhile, the United States seems to be on track to quadruple the number of EVs on the road by 2025, thanks largely to significant government funding, a smaller number of players, and a more advanced mastery of roaming. Participants in the urban mobility roundtable discussed several key actions the industry will need to scale EV architecture:

Build public–private partnerships focused on scaling the EV ecosystem and architecture. Governments, utilities, equipment providers, and automotive OEMs will need to partner to tackle this capital-intensive challenge. Government subsidies will be necessary to expand the charging network by incentivizing customers to purchase EVs, as well as incentivizing OEMs and local businesses to build infrastructure, particularly in rural areas. In the United States, President Biden's $2 trillion infrastructure plan includes $174 billion for these purposes. ABB E-Mobility Division President Frank Mühlon noted that charge stations in Europe are partnering with OEMs such as Volkswagen to develop EV hardware and software. "We are developing a new industry and ecosystem here," he said.

Develop faster, more convenient chargers. To achieve the convenience needed for scaling, the EV charging ecosystem will need to offer fast charging outlets in places where people can incorporate them into their existing habits, such as in grocery stores, gyms, sporting venues, and shopping malls. However, long-haul travel solutions are still needed, including how to manage EV breakdowns and vehicles that run out of power on the highway. "A key challenge for infrastructure

providers is how to help get the best from growth in EV numbers on the networks whilst also assuring operational safety and smooth, efficient journeys," said Peter Mumford, the executive director of major projects and capital portfolio management at Highways England.

Andrew Roberts/Unsplash

Upgrade the grid along heavily trafficked routes to make headway in commercial trucking. There is a significant difference between passenger EVs and long-haul commercial trucking—and development for the latter is nascent. Large trucks require large batteries and hence may require megawatt chargers along highways to facilitate efficient recharging. This in turn will likely mean grid upgrades and associated capital investments. As a first step, the grid should be assessed along routes that are highly frequented between major cities to ensure adequate capacity exists to handle truck charging. "We see interest from truck fleets to do pilot projects for smaller trucks—but even with a 50-kilowatt charger, it was an overnight charging experience," said Cathy Zoi, CEO of EVGo. Getting fleets to adopt EVs will help accelerate infrastructure utilization. Given the interdependencies between vehicle manufacturers, charging-infrastructure providers, and electric utilities, partnerships will be necessary to integrate today's 350 kilowatt chargers into the charge network.

Conclusion: The path ahead

A poll of 2021 GII Summit participants asked: what are the two most important actions for governments to help support economic recovery? The response resonated throughout the Summit: investing in green and sustainable infrastructure to help meet net-zero targets, and committing to a five-year infrastructure investment strategy with a pipeline of prioritized projects.

On the former, Summit discussions made clear that climate change is much more than a buzzword—it's become a powerful call to action. In the words of Canadian Minister of Infrastructure and Communities Catherine McKenna, "We all need to wake up every single day and figure out how we're going to be net-zero by 2050. It's not just an economic opportunity. It's not just a huge risk. It's also an obligation to future generations."

On the latter, participants discussed a host of ideas for how to create more long-term stability and visibility into infrastructure pipelines. Establishing long-term funding sources, such as infrastructure banks, reinforced by national infrastructure plans with prioritized projects over a multiyear horizon, can go a long way to provide certainty and engage private capital.

To succeed on both counts, bold commitments and strong collaboration across the public and private sectors is essential. The challenges and uncertainty experienced over the past year have had unprecedented effects on our industry. But this moment is not to be lost. The pandemic recovery has demonstrated what we can accomplish when we come together as a global community in a disciplined manner. With this same level of focus, industry stakeholders can use infrastructure investment to drive multiple outcomes, including the jump-starting of economies, job creation, decarbonization, resilience, and social equity. Those organizations that step up their game now will be better prepared to confront future challenges—and contribute to building a more resilient, inclusive world.

Participants

More than 500 world leaders in capital projects and infrastructure joined us virtually April 6–8, 2021, to discuss delivering the project of the future.

Deepak Aatresh —Co-Founder, CEO and Director, Aditazz
Hans-Martin Aerts —MD & Head of Infrastructure Investments, Asia Pacific, APG
Pratik Agarwal —Managing Director, Sterlite Power
Raj Agrawal —Partner & Global Head of Infrastructure, KKR
Tolga Akkaş —Chief Executive Officer, Doğuş Construction & Trade
Bashar Al Malik —Chief Executive Officer, Saudi Railway Company
Mohammed Al Ramahi —Chief Executive Officer, Masdar
Furqan Alamgir —Founder & CEO, Connexin
Sir Danny Alexander —VP & Corporate Secretary, Asian Infrastructure Investment Bank
Bob Alger —President Infrastructure Projects, SNC-Lavalin
Jose Rene Gregory Almendras —CEO & President, AC Infrastructure Holdings Corporation
Dr. Christine Altendorf —Director of Military Programs, U.S. Army Corps of Engineers
Sara Alvarado —Head of Risk, Canada Infrastructure Bank
Biren Amin —Head of Global Real Estate and Infrastructure, Public Investment Fund
Dev Amratia —Co-Founder & CEO, nPlan
Jean-Marc Arbaud —President & CEO, CDPQ Infra
David Arena —Head of Global Real Estate, JPMorgan Chase
Murtaza Ata —Group President, Energy, Kalyon Holding
Naaman Atallah —Chief Executive Officer, Nakheel
James Atkinson —President & Chief Customer Officer, Bluebeam
Anuj Awasthi —Vice President Operations, Credit Guarantee & Investment Facility
Roger Bailey —Chief Technical Officer, Tideway
Derron Bain —Managing Director, Concert Infrastructure Fund
Jim Banaszak —Partner, McKinsey & Company
Avery Bang —Chief Executive Officer, Bridges to Prosperity
Benjamin Bao —Member of Executive Committee, China Investment Corporation
Claus Baunkjaer —Chief Executive Officer, Femern
Sue Bayat —President, Entech Engineering PC
Roger Bayliss —Projects Director, MTR
Lori Bean —Partner, Clifford Chance
John Beck —Executive Chairman, AECON
Jeremy Beeton —Non Executive Director, John Laing Group
The Honorable Stephen Benjamin —Mayor, City of Columbia, South Carolina
Dror Benshetrit —Founder & Chief Creative Officer, Studio Dror
Ann Bentley —Global Board Director, Rider Levett Bucknall UK
Greg Bentley —CEO and Chairperson of the Board, Bentley Systems

David Bentley —Founding Partner, ATLAS Infrastructure
Ralph Berg —Global Head of Capital Markets, OMERS Infrastructure Europe
Gus Bergsma —Chief Revenue Officer, Bentley Systems
Michael Berkowitz —Founding Principal, Resilient Cities Catalyst
Pablo Bernad —Consultant Infrastructure Practice, Spencer Stuart
Phillip Bernstein —Associate Dean, Yale School of Architecture
Vincent Bérubé —Senior Partner, McKinsey & Company
Gautam Bhandari —Partner, I Squared Capital
Aaron Bielenberg —Partner, McKinsey & Company
Tomas Björnsson —VP of E-mobility and CEO of InCharge AB, Vattenfall Group
Klaus Blachnik —Chief Procurement Officer, OMV
Marc Blanchet —Executive Director, ARTM
Jose Luis Blanco —Partner, McKinsey & Company
Brodie Boland —Partner, McKinsey & Company
Inigo Bonilla —Director, Trimble
Brendan Bourke —Chief Executive Officer, Port Of Melbourne
David Bowcott —Global Director – Growth, Innovation & Insight, Aon
Harry Bowcott —Senior Partner, McKinsey & Company
Denise Bower —Executive Director, External Engagement, Mott MacDonald
Terry Bowles —President and Chief Executive Officer, St. Lawrence Seaway Management Corporation
Platt Boyd —Founder & CEO, Branch Technology
Tom Boyle —Chief Design & Construction Officer, Encompass Health
Graham Bradley —Chairman, Infrastructure New South Wales
Chris Bradshaw —Chief Marketing Officer, Bentley Systems—President & CEO, Canada, WSP Global
Ryan Brain— President & CEO, Canada, WSP Global
Roy Brannen —Chief Executive, Transport Scotland
Ulrik Branner —Chairman & Executive, LetsBuild
Denis Branthonne —Founder & CEO, Novade
Christopher Bredholt —Vice President - Senior Credit Officer, Moody's Investors Service
Andreas Breiter —Partner, McKinsey & Company
Guido Bressani —Consultant, Spencer Stuart
Tom Brinded —Partner, McKinsey & Company
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Roz Buick —Senior Vice President, Strategy, Product & Development, Construction & Engineering Global Business, Oracle
Hanne Buis —Executive Vice President & CPAO, Royal Schiphol Group
Mikkel Bülow-Lehnsby —Chief Executive Officer, Nordic Private Equity Real Estate Company
Jan Bunge —Managing Director, Squint Opera
Amy Bunszel —EVP of Architecture, Engineering and Construction Design Solutions Group, Autodesk
Clare Burgess —Partner, Clifford Chance
Suzanne Burns —Partner, Spencer Stuart
Jeffrey Busby —Director, Infrastructure Programs, TransLink
Gerrard Bushell —Executive Chair, The New Terminal One at JFK
Philippe Busslinger —Head of Europe, Infrastructure, OMERS Infrastructure Europe
Lauren Callaghan —Executive Recruiter, Spencer Stuart
Antonio Cammisecra —Director Global Infrastructure and Networks, Enel

John Campbell —Founder & Non-Executive Chairman, Campbell Lutyens

Glenn Campbell —Assistant Deputy Minister, Infrastructure Canada

Mike Carragher —President & CEO, VHB

Paul Carrington —Partner, Clifford Chance

Troy Carter —Chief Strategy Officer, Supernature Labs

George Casey —President & CEO, Vantage Airport Group

John Casola —Chief Investment Officer, Canada Infrastructure Bank

Marcelo Castillo Agurto —Head of Business Development, Global Infrastructure and Networks, Enel

Ani Castonguay —Executive Vice-President, Public Affairs, CDPQ Caisse de depot et placement du Quebec

Sam Chai —President, Kiewit Development Company

Heather Chalmers —President & CEO, GE Canada

Tilly Chang —Executive Director, San Francisco County Transportation Authority

Advait Chaturvedi —Director, Overseas Infrastructure Alliance

TC Chew —Director, Global Rail Business, Arup

Raymond Ch'ien —Chairman, Hang Seng Bank

DooWhan Choi —Chief Executive Officer, Posco ICT

James Chopty —Deputy CEO International, EGIS

Andrew Claerhout —Partner, Searchlight Capital

Lance Clarke —VP Commercial and Strategy, Maritime Iron

Gregory Clum —Chief Commercial Officer, KLJ Engineering

Pierce Coffee —President, North America, Transurban

Rob Collins —Managing Partner, 3i NA Infrastructure Fund, 3i Group

Ehren Cory —Chief Executive Officer, Canada Infrastructure Bank

Nuno Costa —Chief Executive Officer, Quadrante

Carlyle Coutinho —President, North America, Enwave Energy Corporation

Gonzalo Covarrubias —Managing Director, WSP Peru

David Cowan —Consultant, Spencer Stuart Middle East

Paul Crowe —Chief Investment Officer, Plenary Australia

Beatrix Dart —Board Member, Professor of Strategy and Executive Director of the Initiative for Women in Business, EllisDon & University of Toronto

Gareth Davies —Director General, Department for Transport, United Kingdom

Arnaud de Bresson —Chief Executive Officer, Paris Europlace

Antonio De Gregorio —Partner, McKinsey & Company

Marie-Ange Debon —Chief Executive Officer, Keolis

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