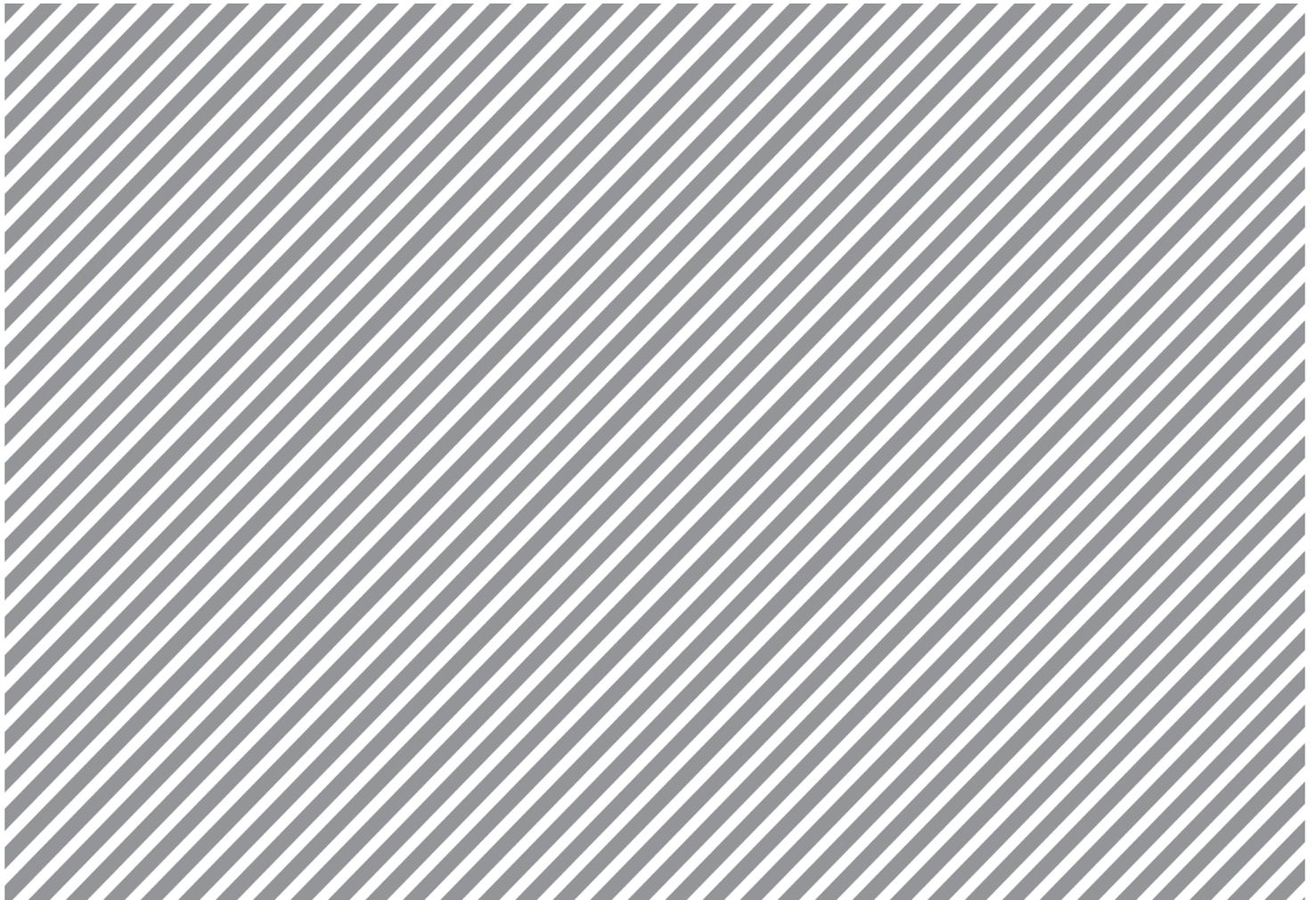


Community Paper

Rebalancing Risk Allocation in Infrastructure:

A collective effort to improve collaboration between the public and private sectors

January 2020



World Economic Forum
91-93 route de la Capite
CH-1223 Cologny/Geneva
Switzerland
Tel.: +41 (0)22 869 1212
Fax: +41 (0)22 786 2744
Email: contact@weforum.org
www.weforum.org

© 2020 World Economic Forum. All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, including photocopying and recording, or by any information storage and retrieval system.

Contents

Executive summary	4
24 October 2019 workshop: Introduction and purpose	6
Risks and recommendations	7
1. Macroeconomic, business and commercial risks	7
2. Technical risks	8
3. Political and regulatory risks	9
4. Environmental and climate change risks	10
5. Capacity and dispute resolution and the management of risks	11
6. Technology risks	12
7. Procurement model risks	13
Conclusion and next steps	14
Appendix	15
Contributors	18

Executive summary

Background and rationale

Around the world, the demand for infrastructure is unprecedented. Urbanization is driving demand for additional infrastructure and, more importantly, for a resilient and future-ready built environment.

At the same time, the delivery of this built environment is constrained by several limitations and inherent restrictions that compromise the infrastructure value chain's ability to reach its full potential. The most urgent of these limitations is the imbalance in risk allocation between the public and private sectors in existing transactions and contract structure. This suboptimal state currently inhibits both public- and private-sector stakeholders from delivering and maintaining infrastructure that meets the changing needs of the community while addressing the challenges of the future, such as climate change.

As a response to this challenge, the Steering Committee of the Infrastructure and Urban Development Industries at the World Economic Forum convened a workshop on risk allocation in infrastructure on 24 October 2019 in Paris, France. The Steering Committee, a subgroup of CEOs of the Infrastructure and Urban Development community, holds quarterly meetings to discuss the sector's global priorities. The committee aims to identify ways to support the development of the sector by launching initiatives in collaboration with the Forum.

The Working Group

At the workshop, 27 participants from various sectors of the infrastructure ecosystem convened to discuss a series of risks. This group was tasked with a clear mandate to develop recommendations to overcome risk allocation challenges and promote the delivery of quality infrastructure. The sectors represented were commercial banks, engineering and construction, infrastructure investors, professional services, technology and insurance. In addition, experts from civil society organizations participated to add value and depth to the conversations.

This Community Paper summarizes the workshop discussions, focusing on the recommendations to improve the transactions and processes and, most importantly, the relationship between the public and private sectors in delivering and managing quality infrastructure assets. (For the purpose of this paper, the participants of the 24 October workshop and/or others who provided comments to this paper are referred to as the "Working Group".)

The workshop – discussion on risk allocation, management and mitigation

The Working Group addressed seven areas of risk:

1. *Macroeconomic, business and commercial risks*: It has been widely maintained that the majority of these risks, especially the risks of exchange rates and obsolescence, should be undertaken by the public sector. In addition, the insurance sector should investigate the development of new insurance products to mitigate certain business risks, such as those associated with the price volatility of variable costs between the submission of bids and the signing of the contract.
2. *Technical risks*: These arise from unknown physical conditions and limitations typically discovered or confirmed during the construction phase of the project life cycle. They are inherent and unavoidable in the infrastructure business, although some are more difficult to manage than others. Establishing a "single source of truth" when dealing with project data and improving technical capacity among project stakeholders are among the most important recommendations to address the lack of collaborative spirit and transactional approach in infrastructure projects.
3. *Political and regulatory risks*: As these risks are inevitable in the medium to long term, it is important to appoint a single point of contact to address the implications of changes in regulation as efficiently as possible.
4. *Environmental and climate change risks*: The role of the financial/insurance sector in adopting and standardizing environmental, social and corporate governance (ESG) metrics has been highlighted several times in the discussion about mitigating environmental and climate change risks. According to the Working Group, access to finance should be contingent on compliance with ESG standards and targets evaluated over the course of the asset's life cycle rather than just its construction period. At the same time, it is imperative to seek the alignment of environmental legislation at the municipal, state, regional and federal levels.
5. *Capacity and dispute resolution and the management of risks*: A deliverable contract that considers the counterparty's (owner's) levels of knowledge and competence needs to be provided to avoid useless complexity. In addition, the public sector should reduce its reliance on advisers by developing professional capacity to work on an even ground with the private sector. Both parties should strengthen their collaboration on transparency upfront and increase communication.

6. *Technology risks*: The current business models, which are overly focused on price and prescriptive inputs, need to be improved. To unlock innovation, owners should reform the procurement process to emphasize a whole life-cycle cost approach, with a focus on performance to meet or exceed project requirements. The private sector could take ownership of educating all infrastructure stakeholders on the benefits of technology, enabling them to promote innovation.
7. *Procurement model risks*: Traditional procurement models are frequently highly adversarial, are usually designed to appoint contractors on the basis of the lowest construction cost, and have helped create a construction supply chain that is systemically weak and fragmented. The public and private sectors together should improve the existing models of delivery by adding a collaborative and transparent approach.

Conclusion

After a thorough analysis and an exchange of experiences on pressing challenges under the seven risk categories, the Working Group concluded that the adoption of collaborative practices in delivering and managing infrastructure will act as the most important catalyst in accelerating the adoption of all necessary measures and recommendations mentioned during the workshop.

The need for a collaborative approach was highlighted as a key enabler to implement diverse recommendations to address a lack of innovation, technical and technology risks, dispute resolutions and contract management. The Working Group expects that a procurement model, enhanced with collaborative practices such as Project 13 from the United Kingdom or alliance contracting from Australia, will mitigate inefficiencies such as bids that are based solely on price and input specifications, costly disputes and failure to reward innovation and outperformance. In addition, a collaborative contracting method is expected to improve public-sector capacity building and encourage a necessary change in culture to the industry. Most importantly, the overall benefit of better collaboration between infrastructure stakeholders is improvement in the delivery of value to the end user community.

Next steps

The Working Group agreed to support a plan to accelerate the adoption of collaborative models. The plan should also identify how to address existing regulatory limitations in procuring public-sector infrastructure, especially those financed mainly by private capital, such as public-private partnerships and other public-private structures. Project 13 and other collaborative methods, such as alliance contracting, need to be introduced, thoroughly articulated and further explained to both the industry and the public sector.

24 October 2019 workshop: Introduction and purpose

The gap between projected infrastructure spending and the amount needed to meet the world's infrastructure needs is estimated to balloon to about \$15 trillion by 2040. As public financing will be insufficient to meet these demands, private-sector resources are needed to close the gap.

In most markets, warning signs have emerged and point to a rising challenge to the prevailing models of delivery of large and complex infrastructure projects. For instance, contractors are withdrawing from bidding on fixed-price contracts due to an imbalance in risk allocation. Meanwhile, taxpayers in major cities have signalled a demise of the private sector's role in infrastructure delivery, as the public perception of public-private partnerships has declined due to the model's inconsistent performance.

To stem the crisis, infrastructure leaders in the World Economic Forum community have identified the need to enhance collaboration between industry and the public sector to jointly promote trust and a solutions-based approach to ensure successful delivery and the long-term performance of infrastructure projects. To further advance this dialogue and achieve tangible results, the Forum Infrastructure and Urban Development community organized the Rebalancing Risk Allocation in Infrastructure workshop in Paris, France on 24 October. The workshop was designed to prepare the Governors policy session on risk allocation and mitigation at the World Economic Forum Annual Meeting 2020 in Davos-Klosters.

The Working Group was charged with advancing the topics considerably to reform existing practices and find new opportunities to enhance value creation through infrastructure delivery. Participants focused on seeking new ways to encourage public-and private-sector collaboration to develop complex infrastructure megaprojects. The Working Group identified 2-3 priority issues within each risk category, along with recommendations for action to be taken by public- and/or private-sector stakeholders.

This paper summarizes each of the seven risk areas in different sections. Each section includes a table outlining the key practices ripe for reform, along with recommendations for public- and private-sector action. The final chapter presents the workshop's overall conclusion and provides next steps for further exploration as part of the ongoing discussion at the Forum Annual Meeting 2020.

The workshop addressed seven risk areas:

1. Macroeconomic, business and commercial risks
2. Technical risks
3. Political and regulatory risks
4. Environmental and climate change risks
5. Capacity and dispute resolution and the management of risks
6. Technology risks
7. Procurement model risks

Risks and recommendations

1. Macroeconomic, business and commercial risks

Macroeconomic and business risks represent the effect of economic cycles on the long-term partnerships between the private and public sectors. They result from the inevitable exposure to macroeconomic fluctuations expected to occur during the tenure of a project. Although hedging facilities can mitigate interest rate fluctuations to an extent, foreign exchange fluctuations are very difficult and expensive to manage.

In addition, a clearly observed risk in recent years, with an acute effect on projects, is the volatility in or lack of expected demand of the asset, or even premature obsolescence. This results not only from an inherently optimistic bias during the procurement/tendering process, but also and, more importantly, from changing needs in infrastructure services due to major trends in technology, the transformation of industries and the emergence of new business models. Moreover, the default risk of a major counterparty in any infrastructure deal can endanger the entire project. The failure of major subcontractors or payment defaults by procuring authorities put stress on project cash flows through delays in payments, the inability to deliver on time or the failure to meet contractual provisions.

Finally, the procurement process itself exposes bidders to price volatility, often due to the lengthy period between the submission of bids and the signing of the contract. As a result, by the time actual construction begins, project costs may have changed substantially. This is particularly important as most projects are delivered through lump-sum contracts.

The Working Group identified two practices that need to change to improve efficiency in dealing with macroeconomic and business risks:

1. *Ambiguity on the allocation of risk*: This occurs from the submission of the bid to the signing of the contract with the project owner.
2. *The lack of clarity on the allocation of macroeconomic and business risks throughout the life of the asset*: This can include demand risk, risk of obsolescence and foreign exchange risk.

Macroeconomic, business and commercial risks and recommendations			
Practices to reform	Public sector	Private sector	Public and private sectors
1. Ambiguity on risk allocation regarding the macroeconomic, business and commercial risks during the processing period between bid submissions and contract signing	Provide transparent mechanisms for risk management during procurement, such as risk pools	Clearly articulate the variables that can affect the risk before the bids are submitted	Agree on a suitable and objectively measurable adjustment formula during the period between the bid submission and the signing of the contract
2. Industry practice and contractual terms that poorly define public- and private-sector risk burden on macroeconomic and business risks, such as foreign exchange risk, risk of obsolescence and commodity price risk	Consider during the master planning phase the extent to which some of these risks are more efficiently carried by the public sector, such as the risk of early obsolescence; evaluate external impacts to infrastructure demand, usage forecast and operating costs (e.g. a toll bridge may be subject to, for example, population change, employment rates, fuel prices and the availability of alternate modes of transportation)	Work with the insurance industry to explore the scope for more products to address the most difficult risks (e.g. exchange rates)	None identified

2. Technical risks

Technical risks arise from unknown physical conditions and limitations typically discovered or confirmed during the construction phase of the project life cycle. They are inherent and unavoidable in the infrastructure business, although some are more difficult to manage than others.

Technical risks in general have two main characteristics: predictability and impact on project cost. Unpredictable risks, such as natural disasters, are high-consequence events and extremely difficult to anticipate. Some risks that can be anticipated, yet remain very difficult and costly to mitigate, include the risk of encountering archaeological findings, hazardous materials and adverse geological conditions at the project site.

In addition, dense urban locations, buried utilities and utility relocations are common technical risks that can be particularly costly if not managed effectively. Such risks can be anticipated and mitigated through due diligence during early-stage planning and inclusion of the private sector during the project inception and design. Collaborative models can significantly mitigate this risk, as all parties will identify the risk earlier in project delivery. Current models of infrastructure delivery exclude such important stakeholders as utility companies from the early stages of due diligence which, as a result, causes limited if any capacity to solve conflicts arising from buried utilities. The effect of these “anticipated” risks is very much subject to the mechanisms of solving any potential disputes among project stakeholders.

Finally, as infrastructure projects become increasingly complex, the risk of changes in the technical scope through the construction period increases. Project variations and change orders become the source of long disputes between owner and contractor that delay construction progress while exposing the project to additional risks due to financial obligations, as the project schedule continues to elapse.

The Working Group identified the need to address two problems to better manage the inevitable nature of technical risks:

1. *The lack of centralized data in projects:* As a result, various stakeholders might use different data sources, possibly leading to costly errors and significant cost overruns or delays to the project. Studies have shown that transparency among project stakeholders breeds strong adoption of best practices.
2. *Inadequate project contract in the area of rewarding outperformance against project specifications:* Project contracts currently focus on penalties for poor performance rather than on rewards for outperforming project requirements.

Technical risks and recommendations

Practices to reform	Public sector	Private sector	Public and private sectors
1. Lack of centralized data, with stakeholders using different data sources resulting in costly errors and significant cost overruns or delays	Appoint knowledgeable individuals and build institutional capacity by providing technical training to staff in key positions that oversee infrastructure project design and management	Provide greater transparency on costs and practices Support an approach of “single source of truth” regarding project data	Define the project management process early to avoid cost/time overrun approval (i.e. owner-contractors technical committee, external expert evaluation)
2. Tendency of typical contracts to rely on penalties (“sticks”) for poor performance rather than use reward incentives (“carrots”) for outperforming project requirements	Focus on outcomes by issuing performance specifications to encourage innovative practices Focus less on inputs by being less prescriptive on contractor processes and methods	None identified	Ensure early collaborative dialogue among all stakeholders from the inception and design of the project Put collaborative mechanisms in place to support innovation and value creation, and reward exemplary performance in specifications and contract terms

3. Political and regulatory risks

Political and regulatory risks in the infrastructure sector may emanate from the routine execution of government duties or changes in government policies. These two common risks can have a significant effect on project delivery and operation.

While numerous other important political and regulatory risks exist, the Working Group highlighted two because collaborative mitigation seems attainable and relatively straightforward:

1. *Delays in government approvals*: This relates to risks before construction starts, such as a delay (or failure sometimes) in issuing work permits as well as amendments to such permits, and other regulatory risks that inhibit free access to the construction site. The root of this problem is often the lack of coordination among governing bodies that need to be onboarded to the project's purpose and execution timeline. Complex infrastructure projects that span multiple jurisdictions (e.g. national, subnational, local) are subject to greater risks of this nature.
2. *Changes in laws*: Such changes, including those in tax regimes, relate to long-term risks that affect projects throughout the project life cycle. The tendency to procure projects using a whole life-cycle costing approach is increasing, so changes in regulations that affect project economics need to be considered under a thorough approach.

Political and regulatory risks and recommendations			
Practices to reform	Public sector	Private sector	Public and private sectors
1. Delays in government approvals related to the lack of coordination between various government entities involved in issuing permits and other relevant regulation that affects free access to the site	Identify a single point of contact to undertake responsibility to coordinate and execute on behalf of all involved government bodies	None identified	None identified
2. Changes in laws as mechanisms focus on costs rather than on the financial impact of delays	Clearly allocate the risk and include effective (swift) resolution mechanisms in tender documentation Have a single point of contact for all government bodies Ensure project ownership for coordinating authorities	None identified	Work together with government, financiers and insurance providers to design risk pool facilities to address the effect of changes in regulation Discuss and agree on the appropriate risk allocation and consultation process at the outset (prior to the onset of the risks)

4. Environmental and climate change risks

Infrastructure is a long-term investment, and environmental risks, including those resulting from climate change, pose great challenges to the infrastructure industry's future. To improve the sector's sustainability, the entire infrastructure supply chain will need to innovate and adopt new technologies and materials. An industry transformation is needed to meet new environmental outcomes and specifications.

This transformation will require considerable investment in innovation. All stakeholders of the infrastructure ecosystem must bear the cost of this in an equitable way. Innovation that de-risks infrastructure assets from the future effect of environmental uncertainties should be compensated in a way that reflects potential cost savings. Governments and the finance and insurance industries need to collaborate closely with contractors, building materials and equipment providers, and all relevant suppliers in the supply chain to agree on strategic investments in innovation and roll out a plan towards implementation.

The Working Group identified two challenges to addressing environmental and climate risks:

1. *The lack of common environmental, social and governance (ESG) metrics and standards:* To help quantify and assess sustainability and resilience of infrastructure assets, numerous ESG standards and sustainable infrastructure rating systems have been developed. Currently no universally accepted standard methodology exists to assess and manage ESG-related risks in delivering and operating infrastructure assets. The Working Group highlighted the importance and urgency to adopt an international regulatory and risk measurement standard. Infrastructure currently being delivered will remain in the urban landscape for decades, which means a consensus must be reached and rules of ESG compliance implemented as soon as possible.
2. *The slow adoption of ESG standards by the financial/ insurance sector:* The Working Group emphasized the significant influence that the financial sector can exercise to advance the adoption and implementation of ESG standards. By mandating minimum ESG performance standards for future projects and investing capital only in projects that meet agreed ESG criteria, the financial sector can encourage widespread adoption of ESG standards across the infrastructure industry.

Environmental and climate change risks and recommendations

Practices to reform	Public sector	Private sector	Public and private sectors
1. Lack of clarity in standards and methodology to assess environmental impact and ESG compliance	Seek alignment of environmental legislation at municipal, state, regional and federal levels	None identified	Agree on clear standards on ESG and sustainability methodology (general framework from which countries can operate)
2. Slow adoption of ESG standards by the financial/insurance sector as a prerequisite for any economic activity	Adopt ESG standards in public codes and procurement specifications to create an environment to encourage finance for sustainable infrastructure	Ensure access to finance is subject to compliance with ESG standards and targets, and make it conditional on the asset's whole life cycle rather than on its construction period	Ensure that contractors and other suppliers invite and involve financiers, insurance companies and governments in the design of the right motives for investments in order to address challenges resulting from climate change

5. Capacity and dispute resolution and the management of risks

The Working Group focused on the importance of principles that facilitate the process of dispute resolution and the planning, management and monitoring of projects.

Current practice suggests that disputes are mostly resolved through costly and lengthy arbitration at the end of a project, rather than through ongoing negotiation and recognition during project implementation, which does not recognize the need for a balanced approach to ensure that project implementation runs with the minimum of delays. The Working Group highlighted that the current practice of arbitration is very time-consuming and expensive, and ultimately does not lead to a permanent resolution.

The Working Group identified two main practices that need to change:

1. *The lack of inclusive long-term planning:* Strong project ownership starts from the setting of long-term development goals and the need for a long-term infrastructure plan, with a prioritized portfolio of projects for implementation, as part of a holistic view of infrastructure needs.

2. *The inability to build and sustain capacity in the public sector:* Common practice for governments to mitigate the lack of capacity is an occasional overreliance on advisory services. Consulting services can close the gap of capacity to a certain extent. After a certain threshold, delegating too many responsibilities to third parties dilutes the notion of “project ownership”. In addition, large infrastructure projects are rare in some countries. In such cases, the governmental entities have not built up significant experience in dealing with such projects. The private and public sectors should share experiences from previous projects to prevent procurement from becoming contaminated by positive biases. Over-optimism tends to result in unrealistic bids and promises that cannot be fulfilled, and hence in lengthy arbitrations.

An additional factor that may prevent disputes and facilitate the management and monitoring of projects and associated contracts is the ability to empower and engage all stakeholders in communication from the early stages of project planning to the provision and sharing of relevant data required to implement projects. Collaborative measures and changes in current procurement practices should result in more pragmatic bids and fewer dispute resolutions that substantially increase the cost and the delivery timetable. The Working Group mentioned that too often long-term disputes arise that fail to benefit the parties or projects in the end.

Capacity and dispute resolution, the management of risks and recommendations			
Practices to reform	Public sector	Private sector	Public and private sectors
1. Lack of inclusive long-term planning	Put in place a long-term pipeline and infrastructure plan	None identified	<p>Avoid silo thinking and collaborate across government agencies; engage in long-term planning, providing input from the private sector from previous project experiences at an early stage</p> <p>Ensure transparency and access to project data, and provide relevant and appropriate data in both directions</p> <p>Strengthen collaboration upfront on transparency and increase communication</p> <p>Enhance trust between the parties through a concerted effort to implement the above recommendations as a minimum</p>
2. Inability to build and sustain capacity in the public sector	<p>Reduce dependence on third-party advisers</p> <p>Develop professional human capacity that can work on even ground with the private sector</p>	<p>Encourage contract transparency and unknown risk disclosure</p> <p>Provide deliverable considering the level of knowledge and level of competence of the counterparty (owner) to avoid useless complexity; an extreme technical approach could be perceived as a lack of transparency</p>	None identified

6. Technology risks

Technology advances swiftly, depreciates fast and can be expected to become obsolete for multiple generations during an infrastructure asset's lifespan. By contrast, infrastructure assets have long gestation periods and underlying justifications carry long-term implications, yet must be decided upon in the context of the present.

Technology acts as an increasingly disruptive force, redefining prevailing business models in many industries. The infrastructure sector must formulate appropriate responses to this transformational capacity to mitigate risks, such as stranded assets, and to capitalize on opportunities, such as moving to infrastructure as a service. In addition, the extensive use of digitization in infrastructure raises risks related to cybersecurity. The management and the effective integration of innovation into the procurement process offer opportunities to mitigate these risks and develop the sector. In addition, they are considered fundamental prerequisites to address the challenges emerging from climate change.

The Working Group focused on two areas related to the impact of technology. The first was how to respond to the risks and uncertainties that technological advances bring to infrastructure. The Working Group noted that it is impossible to anticipate the future. Thus, instead of trying to make infrastructure future-proof, the sector should focus on delivering infrastructure that is future-ready – namely, assets and systems that can be readily adapted, repurposed or retired as technology changes underlying assumptions. In parallel, working practices and skills also need to be made future-ready to ensure the sector can respond proactively to advances in technology.

The second area related to technology's impact was how innovation can improve infrastructure value, performance and decision-making as technology advances. The role of data was explored; as infrastructure assets, systems and the sector generate increasing volumes of data, monetizing that data and extracting new insights to make more informed infrastructure decisions are seen as critical enablers to moving the industry forward. Unlocking this requires an open approach to data sharing and the use of common standards. Opportunities are numerous, from real-time reporting on an asset's performance to transparency in communication between the client and the contractor. Data can help bring all stakeholders closer together, enabling greater alignment between a physical infrastructure asset, or infrastructure system, and the underlying social, economic and/or environmental rationale for creating it. This will help to reduce life-cycle cost, maximize value and ensure that the "right" infrastructure is being built.

The Working Group identified two practices that need to change:

1. *Innovation and outperformance that are not rewarded:* The major reasons for this are the absence of a forward-leaning culture that actively promotes innovation and the lack of a procurement regimen supporting innovation. Decision-makers in both public and private sectors have traditionally approached project delivery and operation in a prescriptive way, with the tendency to implement reliable but old tools to address future challenges. Current procurement and assessment models are overly focused on a price towards meeting prescriptive inputs for the construction of an asset.
2. *A focus that is still on inputs and not on infrastructure services:* To unlock innovation, owners could reform the procurement process to emphasize a whole life-cycle cost approach, focusing on performance (and overperformance) towards outputs. The private sector could take ownership of educating all infrastructure stakeholders on the benefits of technology, enabling them to promote innovation.

Technology risks and recommendations

Practices to reform	Public sector	Private sector	Public and private sectors
<p>1. Innovation not rewarded because:</p> <p>Clients are overly prescriptive/bidding outside the norms is not rewarding</p> <p>Too much focus is put on capital expenditure, not operating expenses, which constrains innovation</p> <p>The unproven return on investment prevents innovation</p>	<p>Adopt an outcome-based procurement model</p> <p>Focus on a total cost of ownership to award projects and stimulate innovation</p> <p>Value innovation in the criteria of public procurement</p>	<p>Take ownership of educating key stakeholders and decision-makers on the risks and rewards of technology</p>	<p>Work together to define the industry's future</p>
<p>2. Focus on inputs and not on infrastructure services, meaning:</p> <p>Overly focused on building assets/focused on capital expenditure</p> <p>The industry norm with a limited view that does not take the whole life of the asset into account</p>	<p>Make space for evolutions in contracts</p>	<p>Promote open data sharing/proactive analytics</p>	<p>Gather data on past projects to inform the future</p>

7. Procurement model risks

Traditional models of infrastructure procurement involve separate rounds of public tender at each stage of project development. The models evolved to combat corruption through competitive procurement at a cost to efficiency and performance.

More recently, new alternative models of infrastructure delivery, such as [alliance contracting](#) in Australia and [Project 13](#) in the United Kingdom, have started to emerge based on collaboration supported by the sector's digital transformation. These models focus on delivering long-term value for money. The Working Group discussed Project 13, which serves as a benchmark for many organizations in the sector.

The Working Group found that the main practice that needs to change in the current procurement model is the transactional and adversarial approach that fosters a lack of trust and confidence among parties and leaves the end user disconnected from the supplier of infrastructure.

Traditional procurement models are frequently highly adversarial, are usually designed to appoint contractors on the basis of the lowest construction cost and have helped create a construction supply chain that is systemically weak and fragmented. The resulting lack of margin in the construction industry has led to a failure to invest in the technology and skills that would drive long-run efficiency.

Procurement model risks and recommendations			
Practices to reform	Public sector	Private sector	Public and private sectors
Transactional and adversarial approach that fosters a lack of trust and confidence among parties and leaves the end user disconnected from the supplier of infrastructure	Move to selection criteria that are based on qualifications	Be open to collaborating with procuring authorities and other private organizations to co-invest in skills and technology Learn the necessary skills to succeed in collaborative models (very different than typical models)	Identify and use success metrics that relate to life-cycle cost, not just first cost Move to more transparent, collaborative models, such as Project 13

Conclusion and next steps

The need for a collaborative approach has been highlighted as the main enabler and accelerator to implement almost all the recommendations to improve risk allocation. The Working Group expects that a procurement model based on better collaboration will mitigate inefficiencies; these include bids based solely on price and input specifications, disputes and claims, and the failure to reward innovation and outperformance. In addition, a collaborative contracting method is expected to improve capacity building and bring the necessary cultural change. Most importantly, though, the overall benefit of better collaboration among infrastructure stakeholders is the improvement in the delivery of value to the end user.

The Working Group acknowledges the need to introduce, articulate and explain those types of models in the private and public sector. It also acknowledges the need to articulate how collaborative contracting methods can be implemented to deliver public infrastructure that is financed primarily by private capital under a life-cycle approach. Therefore, as a next step, the Working Group agreed to support the creation of a concrete plan to accelerate adoption of collaborative models and investigate and prioritize which challenges (cultural or from the existing regulatory framework) the infrastructure community should overcome to take advantage of the catalytic effect of collaborative contracting models in delivering quality infrastructure.

Appendix

Summary of recommendations

	Practices to reform	Public sector	Private sector	Public and private sectors
Macroeconomic, business and commercial risks	Ambiguity on risk allocation regarding the macroeconomic, business and commercial risks during the processing period between bid submissions and contract signing	Provide transparent mechanisms for risk management during procurement, such as risk pools	Clearly articulate the variables that can affect the risk before the bids are submitted	Agree on a suitable and objectively measurable adjustment formula during the period between the bid submission and the signing of the contract
	Industry practice and contractual terms that poorly define public- and private-sector risk burden on macroeconomic and business risks, such as foreign exchange risk, risk of obsolescence and commodity price risk	Consider during the master planning phase the extent to which some of these risks are more efficiently carried by the public sector, such as the risk of early obsolescence; evaluate external impacts to infrastructure demand, usage forecast and operating costs (e.g. a toll bridge may be subject to, for example, population change, employment rates, fuel prices and the availability of alternate modes of transportation)	Work with the insurance industry to explore the scope for more products to address the most difficult risks (e.g. exchange rates)	None identified
Technical risks	Lack of centralized data, with stakeholders using different data sources resulting in costly errors and significant cost overruns or delays	Appoint knowledgeable individuals and build institutional capacity by providing technical training to staff in key positions that oversee infrastructure project design and management	Provide greater transparency on costs and practices Support an approach of “single source of truth” regarding project data	Define the project management process early to avoid cost/time overrun approval (i.e. owner-contractors technical committee, external expert evaluation)
	Tendency of typical contracts to rely on penalties (“sticks”) for poor performance rather than use reward incentives (“carrots”) for outperforming project requirements	Focus on outcomes by issuing performance specifications to encourage innovative practices Focus less on inputs by being less prescriptive on contractor processes and methods	None identified	Ensure early collaborative dialogue among all stakeholders from the inception and design of the project Put collaborative mechanisms in place to support innovation and value creation, and reward exemplary performance in specifications and contract terms

Political and regulatory risks	Delays in government approvals related to the lack of coordination between various government entities involved in issuing permits and other relevant regulation that affects free access to the site	Identify a single point of contact to undertake responsibility to coordinate and execute on behalf of all involved government bodies	None identified	None identified
	Changes in laws as mechanisms focus on costs rather than on the financial impact of delays	Clearly allocate the risk and include effective (swift) resolution mechanisms in tender documentation Have a single point of contact for all government bodies Ensure project ownership for coordinating authorities	None identified	Work together with government, financiers and insurance providers to design risk pool facilities to address the effect of changes in regulation Discuss and agree on the appropriate risk allocation and consultation process at the outset (prior to the onset of the risks)
Environmental and climate change risks	Lack of clarity in standards and methodology to assess environmental impact and ESG compliance	Seek alignment of environmental legislation at municipal, state, regional and federal levels	None identified	Agree on clear standards on ESG and sustainability methodology (general framework from which countries can operate)
	Slow adoption of ESG standards by the financial/ insurance sector as a prerequisite for any economic activity	Adopt ESG standards in public codes and procurement specifications to create an environment to encourage finance for sustainable infrastructure	Ensure access to finance is subject to compliance with ESG standards and targets, and make it conditional on the asset's whole life cycle rather than on its construction period	Ensure that contractors and other suppliers invite and involve financiers, insurance companies and governments in the design of the right motives for investments in order to address challenges resulting from climate change

Capacity and dispute resolution and the management of risks	Lack of inclusive long-term planning	Put in place a long-term pipeline and infrastructure plan	None identified	Avoid silo thinking and collaborate across government agencies; engage in long-term planning, providing input from the private sector from previous project experiences at an early stage Ensure transparency and access to project data, and provide relevant and appropriate data in both directions Strengthen collaboration upfront on transparency and increase communication Enhance trust between the parties through a concerted effort to implement the above recommendations as a minimum
	Inability to build and sustain capacity in the public sector	Reduce dependence on third-party advisers Develop professional human capacity that can work on an even ground with the private sector	Encourage contract transparency and unknown risk disclosure Provide deliverable considering the level of knowledge and level of competence of the counterparty (owner) to avoid useless complexity; an extreme technical approach could be perceived as a lack of transparency	None identified
Technology risks	Innovation not rewarded because: Clients are overly prescriptive/ bidding outside the norms is not rewarding Too much focus is put on capital expenditure, not operating expenses, which constrains innovation The unproven return on investment prevents innovation	Adopt an outcome-based procurement model Focus on a total cost of ownership to award projects and stimulate innovation Value innovation in the criteria of public procurement	Take ownership of educating key stakeholders and decision-makers on the risks and rewards of technology	Work together to define the industry's future
	Focus on inputs and not on infrastructure services, meaning: Overly focused on building assets/focused on capital expenditure The industry norm with a limited view that does not take the whole life of the asset into account	Make space for evolutions in contracts	Promote open data sharing/proactive analytics	Gather data on past projects to inform the future
Procurement model risks	Transactional and adversarial approach that fosters a lack of trust and confidence among parties and leaves the end user disconnected from the supplier of infrastructure	Move to selection criteria that are based on qualifications	Be open to collaborating with procuring authorities and other private organizations to co-invest in skills and technology Learn the necessary skills to succeed in collaborative models (very different than typical models)	Identify and use success metrics that relate to life-cycle cost, not just first cost Move to more transparent, collaborative models, such as Project 13

Contributors

Working Group

Markku Allison, Vice-President, Strategy and Innovation, Chandos Construction, Canada

Julianne Altieri, Director, International Financing Institutions, Siemens, USA

Nick Baveystock, Director-General, Institution of Civil Engineers (ICE), United Kingdom

David Bowcott, Global Director, Growth, Innovation and Insight, Global Construction and Infrastructure Group, Aon, Canada

Jennifer Brake, Director, Global Capital Projects and Infrastructure, PwC, United Kingdom

Lisa Brown, Senior National Director, Municipal Infrastructure and Smart Cities, North America, Johnson Controls, USA

Christoph Bruguier, Senior Investment Director, Natixis, France

Jose-Michael Chenu, Vice-President, EGF – BTP, France

Dale Clarke, Executive Vice-President, Strategy and Growth, Infrastructure, SNC-Lavalin, Canada

Steven Crosskey, Head, Strategic Initiatives, United Nations Office for Project Services (UNOPS), Copenhagen

Per Englund, Regional Director, Scandinavia, Jacobs Engineering, Sweden

Bruno Erbel, Managing Director, Marguerite Fund, Luxembourg

Martin Fliss, Vice-President, Global Contract Management, Schneider Electric, France

Bertrand Fournier-Montgieux, Senior Associate, Meridiam, France

Zahi Ghantous, Assistant Vice-President, Consolidated Contractors International Company, Greece

Negash Haile, Policy Analyst, Infrastructure Canada, Canada

Jack Handford, Infrastructure Specialist, Global Infrastructure Hub, Australia

Jean Innes, Director, Transformation and Strategy, Faculty, United Kingdom

Mathew Kattapuram, Senior Vice-President, Strategic Business Development, Aecon Group, Canada

Tomaž Košič, Head, Investment Department, DRI, Slovenia

Giacomo Matarazzo, Head, Project Portfolio Development, Snam, Italy

Michael Moroschan, Commercial Head, Project Acquisition and Execution, Siemens Mobility, Germany

Jon Nield, Chief Executive Officer, Engineering & Construction Risk Institute, USA

Pierre Sorbets, Vice-Chairman, Global Banking, HSBC Holdings, France

Dominic Thasarathar, Technology Leader, Global Construction and Infrastructure Sector, Mott MacDonald, United Kingdom

Richard Threlfall, Global Head, Infrastructure, KPMG, Netherlands

Julien Touati, Director, Corporate Development; Director, Investments, Meridiam Infrastructure, France

Jose Valen Fernandez, Director, Tender Processes and Contract Management, Acciona, Spain

Helga Van Peer, Partner, Allen & Overy, United Kingdom

World Economic Forum

Isidora Kosta, Project Manager, Infrastructure and Urban Development Industries

Oliver Tsai, Platform Curator, Shaping the Future of Cities, Infrastructure and Urban Services Platform



COMMITTED TO
IMPROVING THE STATE
OF THE WORLD

The World Economic Forum, committed to improving the state of the world, is the International Organization for Public-Private Cooperation.

The Forum engages the foremost political, business and other leaders of society to shape global, regional and industry agendas.

World Economic Forum
91–93 route de la Capite
CH-1223 Cologny/Geneva
Switzerland

Tel.: +41 (0) 22 869 1212
Fax: +41 (0) 22 786 2744

contact@weforum.org
www.weforum.org