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**Economic Commission for Europe****Committee on Innovation, Competitiveness and Public-Private Partnerships****Working Party on Public-Private Partnerships****Eighth session**

Geneva, 25-26 November 2024

Item 4 of the provisional agenda

**Review of the work since the seventh session of the Working Party on Public-Private Partnerships on 30 November - 1 December 2023****Guidelines on improving the delivery of Public-Private Partnerships projects and infrastructure through digital transformation throughout the project lifecycle in support of the Sustainable Development Goals****Note by the Bureau\****Background*

This document contains guidelines with policy options and recommendations for governments on improving the delivery of Public-Private Partnerships (PPP) and infrastructure projects through digital transformation throughout the project lifecycle in support of the Sustainable Development Goals (SDGs).

The document draws heavily on panel discussions at the sixth and seventh sessions of the Working Party on PPPs at the sixth, seventh and eighth editions of the UNECE International PPP Forum, and at the fifteenth, sixteenth and seventeenth sessions of the Committee on Innovation, Competitiveness and Public-Private Partnerships (CICPPP). It also contributes to the cross-cutting theme of the 70<sup>th</sup> session of the Economic Commission for Europe (ECE) on digital and green transformations for a sustainable development in the ECE region.

The document was prepared by an international drafting team led by Stacy Sinclair and has been endorsed by the Bureau of the Working Party on Public-Private Partnerships with a recommendation for the Working Party to endorse it. The drafting team leader was supported by core contributors Sara Alvarado, Frederic Bobay, Mark Enzer, Petra Ferk, Neli Garbuzanova, Jean-Patrick Marquet, Nesrin Öztapak, Cédric Van Riel and Peter Ward. The document also benefited from comments by public sector experts in ECE member States.

The document is submitted to the Working Party for decision.

The Bureau is grateful to the drafting team experts (listed in Annex III) for their contribution.

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\*This document was scheduled for publication after the standard publication date due to consultations with interested parties and stakeholders.



## I. Introduction

Climate change is one of the most defining challenges of our time, with the infrastructure sector playing a major role in driving emissions and ocean acidification, accounting for over half of global CO<sup>2</sup> emissions.<sup>1</sup> The construction industry alone contributes about 21 percent of global greenhouse gas (GHG) emissions.

Many countries lack the fiscal capacity to finance clean projects, preventing them from realizing the associated benefits of reduced GHG emissions and the resulting socioeconomic benefits. Despite ample private sector investment-ready financing from pension plans, insurance companies, banks and asset managers, the inability to access financing stems from the lack of “bankable” projects. A significant gap exists between the global financing available for infrastructure projects and governments’ ability to access these funds. Bottlenecks at the pre-procurement stage, such as early project development, coordination of public and private financing, government approvals, and stakeholder consultation, hinder project progress, delaying the delivery of vital economic benefits to society.

With limited time remaining to achieve the Sustainable Development Goals (SDGs), an urgent transformation is essential to reduce CO<sup>2</sup> emissions and accelerate project delivery more efficiently. Digital tools offer powerful potential to drive this transformation, enabling infrastructure projects to address these pressing challenges.

The digital transformation of Public-Private Partnerships (PPPs) projects can play a crucial role to this end. In this guide, ‘digital transformation’ refers to the process of transitioning an organization or sector from an analogue approach, often paper-based, to one that is driven by data and technology, enabling the delivery of services, products and infrastructure in innovative and improved ways. As such, this concept is intrinsically linked to creating value and driving growth.<sup>2</sup>

In the context of PPPs and infrastructure projects, ‘technology’ can refer to several aspects:

- (i) Technology projects which build infrastructure in an economy, such as PPP projects for communication, energy, transport, telemedicine and other digital infrastructure;
- (ii) Technology or physical, digital assets which enhance existing infrastructure, such as management and monitoring systems or surveillance and security systems; or
- (iii) Technology which assists, enables or enhances the processes used to deliver infrastructure projects, such as digital platforms used to identify, select and manage projects or to collect and manage stakeholder feedback.

This guide focuses on the third aspect.<sup>3</sup>

Building upon the work of leading international organizations,<sup>4</sup> particularly the collaborative work of multilateral development banks (MDBs) in establishing the SOURCE platform for sustainable infrastructure preparation,<sup>5</sup> this guide provides practical strategies and policy

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<sup>1</sup> See [CO<sub>2</sub> and Greenhouse Gas Emissions - Our World in Data](#).

<sup>2</sup> See Annex I in this guide for a comprehensive definition of digital transformation. See also [What ‘digital’ really means | McKinsey](#).

<sup>3</sup> The ECE Guidelines on PPPs in Digital Infrastructure (ECE/CECI/WP/PPP/2024/4) focus on the first aspect.

<sup>4</sup> These works include, but are not limited to, [State of the Digital Decade 2024 report | Shaping Europe’s digital future \(europa.eu\)](#); [Digital transformation | OECD](#); [OECD Good Practice Principles for Public Service Design and Delivery in the Digital Age | OECD Public Governance Policy Papers | OECD iLibrary \(oecd-ilibrary.org\)](#); [2023 OECD Open, Useful and Re-usable data \(OURdata\) Index : Results and key findings | OECD Public Governance Policy Papers | OECD iLibrary \(oecd-ilibrary.org\)](#); [Digital Transformation: Development news, research, data | World Bank, Digitalisation in Europe 2022-2023 \(eib.org\)](#); [Preparing for PPP contract expiry \(eib.org\)](#).

<sup>5</sup> SOURCE Council: African Development Bank (AfDB), Asian Development Bank (AsDB), Asian Infrastructure Investment Bank (AIIB), European Bank for Reconstruction and Development (EBRD), European Investment Bank (EIB), International Finance Corporation (IFC), the World Bank.

recommendations to harness digital transformation for enhancing PPP delivery in support of the SDGs. It emphasizes that digital tools and technologies are key enablers for improving the efficiency and effectiveness across the entire PPP lifecycle – project identification, development, and implementation. By streamlining processes, automating tasks, increasing transparency, and optimizing performance, digital transformation can also significantly reduce the costs of PPP projects for public authorities. This includes lowering costs throughout the project lifecycle, ultimately resulting in more cost-effective infrastructure.

While this guide considers the entire PPP lifecycle, it places special emphasis on the project identification and development stages, with a particular focus on stakeholder engagement and government approval processes, these being the areas that remain challenging and underexplored in the context of digital transformation in PPP projects.

This guide aims to encourage public authorities to adopt sustainable digital transformation throughout PPP projects' lifecycle. Drawing on international best practices, it supports the cross-cutting theme of the 70<sup>th</sup> session of the Economic Commission for Europe (ECE) in April 2023 dedicated to “digital and green transformations for sustainable development in the ECE region.”<sup>6</sup> It should be read in conjunction with other policy documents published by ECE on the PPPs for the SDGs approach since 2015,<sup>7</sup> in particular the “ECE Guiding Principles on PPPs in support of the SDGs” (Guiding Principles), and with the ECE “Guidelines on PPPs in digital infrastructure: Diagnostics in healthcare (telemedicine) and other digital public services.”<sup>8</sup>

## A. Public-Private Partnerships for the Sustainable Development Goals

According to the Guiding Principles, PPPs are “contract delivery tools for public infrastructure provision involving initial private financing. They include two types: *government-pay PPPs* which are primarily funded by taxpayers and *concessions* which are primarily funded by the users of the infrastructure.” In addition, the Guiding Principles define “PPP for the SDGs” as those PPPs designed to implement the SDGs and thereby to be “fit for purpose”.<sup>9</sup> They can be defined as an enhanced approach for PPPs that overcome some of the shortcomings associated with the traditional PPP model by leveraging the efficiencies, expertise, and innovation of the private sector while safeguarding public interests through balanced risk-sharing, transparency, and accountability.

To align with the SDGs, PPPs must meet five desirable outcomes, which prioritize “people” and “planet” in meeting public infrastructure and service needs. These outcomes are:

- (i) Access and Equity;
- (ii) Economic Effectiveness and Fiscal Sustainability;
- (iii) Environmental Sustainability and Resilience;
- (iv) Replicability; and
- (v) Stakeholder Engagement.

When implementing this approach, particular attention needs to be paid to the rights of vulnerable people by adopting a human rights-based approach to PPPs and infrastructure, particularly by considering the specific needs and rights of marginalized communities. This ensures that the benefits of PPP projects are inclusive and accessible to everyone, regardless of socioeconomic status, location, or ability. Prioritizing a human rights-based approach and key SDG outcomes in a standardized assessment not only enhances the attractiveness of PPPs to lenders but also facilitates a swift evaluation of their capacity to meet stakeholder needs.

In this context, PPPs for the SDGs can play a pivotal role by leveraging digital transformation to drive sustainable development and advance progress toward the SDGs. To support the implementation of PPPs for the SDGs, the “UNECE PPP and Infrastructure Evaluation and Rating System (PIERS)” offers a robust self-evaluation methodology to score projects against SDG outcomes. PIERS complements and puts in practice the Guiding Principles, and

<sup>6</sup> See [E/ECE/1504](#).

<sup>7</sup> See [Standards, Tools & Guides | UNECE](#).

<sup>8</sup> See [ECE/CECI/WP/PPP/2024/4](#).

<sup>9</sup> See Guiding Principles, [ECE/CECI/WP/2022/07](#).

uses both qualitative and quantitative methods, enabling swift and consistent self-assessment. It is designed to be adaptable, allowing for the prioritization of specific needs and transparent decision-making based on project-specific challenges.

Given PIERS' extensive coverage in other ECE documents and its well-established role in SDG-oriented PPP and infrastructure projects, this guide focuses on tools and methodologies external to ECE.<sup>10</sup> This approach aligns with ECE's commitment to add unique value to this field, supporting accelerated progress toward the SDGs across the ECE region.<sup>11</sup>

## **B. Digital transformations in Public-Private Partnerships and the United Nations “Pact for the Future”**

The UN Pact for the Future (the Pact), adopted on 22 September 2024, outlines an ambitious agenda to tackle the world's most urgent challenges, including environmental sustainability, social equity, and economic development, with a focus on achieving the SDGs by 2030. The Pact recognizes the potential impact of PPPs to this effort, leveraging private sector expertise, efficiency, and capital.<sup>12</sup>

The Pact highlights that digital and emerging technologies, including artificial intelligence (AI), play a significant role as enablers of sustainable development and offer huge potential for progress for the benefit of people and planet today and in the future.<sup>13</sup>

To realize this potential and manage the risks through enhanced international cooperation by promoting an inclusive, responsible and sustainable digital future, the Pact contains a “Global Digital Compact”.<sup>14</sup> The goal of the Global Digital Compact is to create an inclusive, open, sustainable, fair, safe and secure digital future for all, achieving it through the following objectives:

- (i) Close all digital divides and accelerate progress across the SDGs;
- (ii) Expand inclusion in and benefits from the digital economy for all;
- (iii) Foster an inclusive, open, safe and secure digital space that respects, protects and promote human rights;
- (iv) Advance responsible, equitable and interoperable data governance approaches; and
- (v) Enhance international governance of AI for the benefit of humanity.

The Global Digital Compact opens by stating:

“Digital technologies are dramatically transforming our world. They offer immense potential benefits for the wellbeing and advancement of people and societies, and for our planet. They hold out the promise of accelerating the achievement of the SDGs.”

This guide responds to the calls to action in the Pact and its Global Digital Compact by offering insights and recommendations for governments and policymakers to enhance the implementation of PPP and infrastructure projects through data and digital transformation, ultimately supporting the achievement of the SDGs and contribute to closing the digital divide.

It also supports the Global Digital Compact's request for digital cooperation and the advancement of digital transformation by providing an overview of the benefits and need for digital transformation in PPP projects, the key considerations for implementing digital tools, and the opportunities and challenges that digitalization can bring throughout the project lifecycle.

Digitalization offers the potential to provide more transparency, efficiency, accountability, insights, inclusivity and a more people-centred approach to PPPs than would be possible without the use of digital tools, ultimately accelerating processes and chances for success. However, to fully realize the benefits and desired outcomes, it is essential to adopt a holistic

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<sup>10</sup> For more on PIERS, see [PIERS methodology | UNECE](#).

<sup>11</sup> See [Focus of the future work of the Working Party \(2022\)](#), p.6.

<sup>12</sup> See [Pact for the Future](#), Action 29, paragraph 53(f).

<sup>13</sup> See [Pact for the Future](#), Action 27, paragraph 51.

<sup>14</sup> See [Pact for the Future](#), Annex I, p.37.

and carefully considered approach to digitalization, with a focus on identifying and mitigating risks at every stage. As the Global Digital Compact notes, the “pace and power of emerging technologies are creating new possibilities but also new risks for humanity, some of which are not yet fully known.” The recommendations in this guide aim to assist governments in identifying and minimizing risks which may arise with regard to digital transformation in the PPP lifecycle.

## II. The need for digital transformation in Public-Private Partnerships for the Sustainable Development Goals

The world urgently needs bankable projects that are aligned with the SDGs and are completed on time and on budget. When applied correctly, data and digital tools have the potential to enable faster and more effective processes throughout the PPP lifecycle, increase transparency, communication, collaboration and inclusivity. In this regard, digitalization is crucial in enabling the five desirable outcomes necessary for PPP projects to meet the SDGs.<sup>15</sup> However, digitalization is not an end in itself; rather it is a powerful enabler.

When implemented effectively, digitalization can empower people, public authorities and other stakeholders to make better, faster decisions using accurate information, improve processes, and apply and integrate technology more wisely.

Digitalization can also establish an efficient, cost-effective process, enabling well-prepared projects and facilitating multi-agency participation and stakeholder engagement. Global standardization of PPP project preparation is essential, and frequently requested by private investors. Investors' portfolio approach, spanning multiple countries and sectors, underscores the need for a unified framework. This demand for standardization drove MDBs to develop jointly the SOURCE platform, integrating international best practices and knowledge for sustainable infrastructure.

Beyond process, digitalization also makes good commercial sense. In other industries, it has delivered efficiencies up to 30 percent process-related costs. This potential for cost savings is still largely untapped in the infrastructure, where digitalization lags behind other sectors.<sup>16</sup>

Digitalization also addresses system-level challenges. The infrastructure sector operates as a complex “system of systems,” where assets and networks are interconnected. Major challenges like climate change, resource depletion, and biodiversity loss affect the entire system, requiring integrated, systems-based solutions. Isolated approaches to policy, decision-making, development, and operation can only produce suboptimal outcomes.

To maximize the potential of both existing and future infrastructure, the whole system and all its asset life-cycle processes must be addressed. While these complex systems cannot be controlled internally, they can be influenced by striving to understand them better, which involves mastering relevant data, information, knowledge, and wisdom. More effective intervention means making better decisions faster in our projects and delivery processes – this is where digitalization truly adds value. However, it must be a collaborative effort.

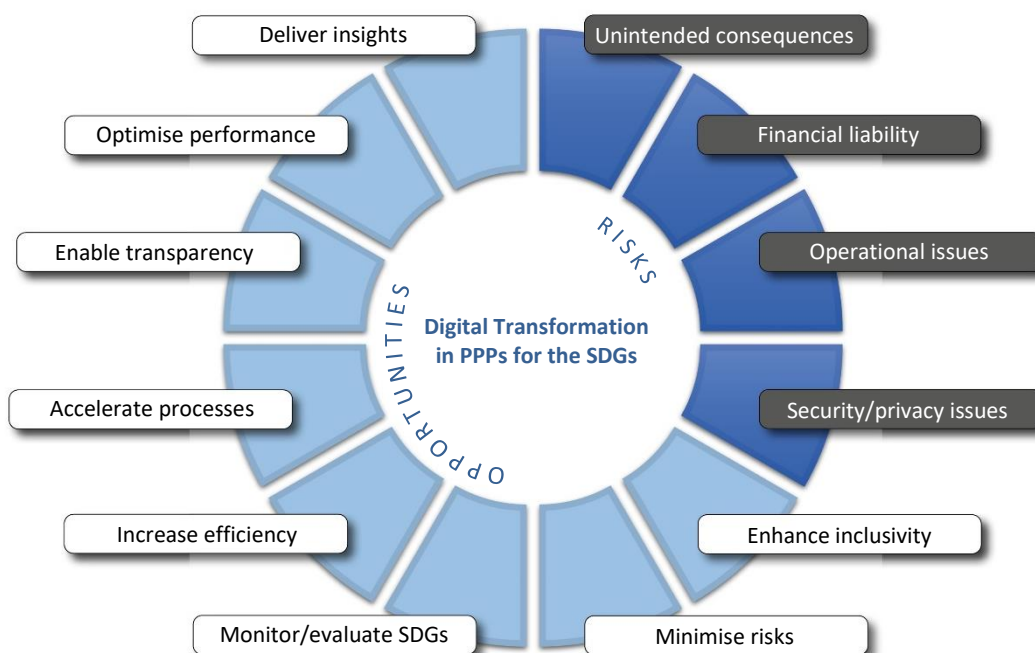
While digitalization offers numerous opportunities and benefits, it also presents risks that must be carefully considered, managed and minimized where possible. Nevertheless, the opportunities outweigh the risks. Without embracing digitalization, infrastructure projects risk falling behind in efficiency, innovation, and sustainability, leading to increased costs.

Some of the key opportunities and risks of digital transformation in delivering of PPPs for the SDGs include the following, as listed on figure 1 below.

<sup>15</sup> See section I.1 above.

<sup>16</sup> KPMG (2021) showed that for around every \$1.25 invested in information management, it could potentially secure \$6.50 of direct labour productivity gains and \$8.70 in direct cost savings, see [The value of information management in the construction - KPMG UK](#). Furthermore, McKinsey (2023) predicts that 30 percent of hours worked today are to be automated by 2030 with use of AI, see [Generative AI and the future of work in America | McKinsey](#).

Figure 1: Opportunities and Risks in Digital Transformation in PPPs for the SDGs



Source: ECE

### III. General rules for success

Governments essentially have two options for implementing digital transformation: they can either provide recommendations for voluntary use of digital tools, or they can legally mandate their use.<sup>17</sup> Each option has its own opportunities and risks and governments must determine the most suitable approach for their country's particular needs. Where the provision of recommendations and guidance does not result in the desired outcome, governments can consider introducing new legislation and policy.

One key option for governments is to use the multilateral platform SOURCE, designed as a global public good and made available for free to developing countries, along with technical assistance for its implementation. The platform provides an infrastructure preparation framework standardized on world scale to facilitate private investments, while being tailored to countries' legal and institutional organisation and processes. Through SOURCE, countries can avail themselves of state-of-the-art cybersecurity and full ownership and sovereignty on their infrastructure data, which are under the legal and technical protection of the United Nations (UN) secure servers.

Whether through recommendations or mandates, implementing digital tools inevitably presents challenges that must be effectively managed and mitigated, especially those aimed at transforming processes and procedures. For the successful digitalization of PPP processes and projects, governments should consider adopting the following key rules, neither listed chronologically nor by importance, and which are detailed in the subsequent sections.

- (i) Design a digital strategy and digital roadmap;
- (ii) Harness data to optimize opportunities and address challenges when doing so;
- (iii) Utilize digital tools developed specifically for the PPP lifecycle;

<sup>17</sup> For example, in accordance with the EU Directive 2014/23/EU on the award of concession contracts, public procurement is mandatory for contracting authorities; however, e-procurement is voluntary. Member States may of course go beyond minimum requirements.

- (iv) Promote communication and transparency;
- (v) Implement and align law, regulation and policy;
- (vi) Endorse, embrace and manage cultural change to ensure adoption;
- (vii) Provide leadership to drive strategy and cultural change for digital transformation;
- (viii) Build capacity and specialised expertise, identify talent and train the workforce;
- (ix) Invest in and construct the requisite digital infrastructure;
- (x) Prioritise cyber security and data protection; and
- (xi) Understand the opportunities and risks of AI.

## **A. Digital strategy and digital roadmap**

Any PPPs for the SDGs project or programme should have a clear, written digital strategy for each stage of its development, establishing which fields of digital transformation are likely to be relevant. The digital strategy should be accompanied by a comprehensive roadmap for implementation, adoption and review.

A digital strategy involves a comprehensive integration of digital technologies with project processes and methodologies, encompassing various components such as data, digital tools and cybersecurity measures. The aim of the digital strategy is to optimize and monitor project performance and outcomes, enhance efficiency, reduce costs, facilitate better risk management and improve transparency and accountability through the strategic use of digital tools.

The strategy should define clear output specifications for the specific tools to be adopted, including digital goals, outcomes, needs and measures of success. It is important to create a robust way of evaluating the extent to which digital tools should be used within a programme, ensuring that they are relevant to the programme and to the digital maturity of the government, its economy and the potential market tenderers and investors.

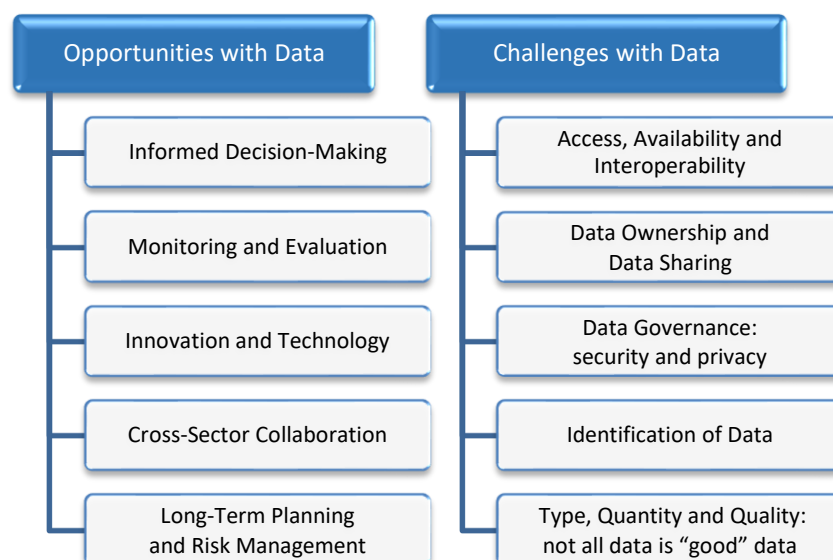
## **B. Harnessing data<sup>18</sup>**

Data is fundamental to the success of digital transformation and achieving the SDGs and is essential for data-driven decision making throughout all stages of PPP projects. Without data, activities such as monitoring, reporting, benchmarking, analysing, optimising and indeed the use of digital tools are not possible. While harnessing data provides a number of promising opportunities, consideration must be given to the challenges and hurdles which inherently arise.

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<sup>18</sup> References to “data” in this section do not include “personal data” as defined in the General Data Protection Regulation, which is outside the scope of this guide.

Figure 2: Opportunities and challenges when harnessing data



Source: ECE

Examples of the opportunities and challenges include:

#### ***Informed decision-making***

Data plays a crucial role in facilitating informed decision-making throughout all PPP stages by providing empirical evidence and insights into social, economic and environmental trends. For example, data enables public authorities and policymakers to make informed choices about resource allocation, policy formulation, and programme implementation. This ensures that decisions are grounded in evidence and aligned with SDG objectives, maximizing impact on sustainable development outcomes.

#### ***Monitoring and evaluation***

Data serves as a cornerstone for monitoring and evaluating progress towards the SDGs. By tracking key indicators and benchmarks, data enables stakeholders to assess progress, identify gaps and measure the effectiveness of interventions aimed at achieving SDG targets. Through data-driven monitoring and evaluation processes, policymakers can make informed adjustments to policies and programmes, ensuring that efforts are aligned with SDG priorities and objectives.

#### ***Innovation and technology***

Data-driven innovation and technology play a transformative role in advancing the SDGs. By leveraging data analytics, AI, and emerging technologies, stakeholders can develop innovative solutions to address complex development challenges. From precision agriculture to renewable energy, data-driven innovations offer scalable and sustainable approaches to achieving SDG targets, unlocking new opportunities for economic growth, social inclusion, and environmental sustainability.

#### ***Cross-sector collaboration***

Data serves as a catalyst for facilitating cross-sector collaboration and partnerships to advance the SDGs. By providing a common language and platform for information sharing, data enables stakeholders from diverse sectors, disciplines and geographic regions to collaborate effectively towards shared SDG objectives. Through data-driven collaboration, stakeholders can leverage complementary expertise, resources, and networks to address interconnected development challenges comprehensively and holistically.

#### ***Long-term planning and risk management***

Data plays a crucial role in supporting long-term planning and risk management strategies in PPPs for the SDGs. By providing insights into future trends, vulnerabilities and opportunities,



data enables stakeholders to model and anticipate risks, develop resilience strategies and plan for sustainable development pathways. Through data-driven risk management and scenario planning, policymakers can identify priority areas for intervention, allocate resources strategically and build adaptive capacity to navigate uncertainties.

#### ***Access, availability and interoperability***

Data may not always be readily available. It can be siloed and difficult to obtain (for example, in different government departments or ministries on different servers). Stakeholders may not be aware that relevant data exists and/or they do not have easy access to it. To enable successful projects, it is important at the outset to identify available data and/or data which must be collected or accessed, and consider its interoperability. In some cases, integrating all data into a unique repository or database will be essential.

#### ***Data sovereign ownership and data sharing***

Governments and public authorities must have legal ownership and sovereign control of the relevant data needed at each stage, and/or understand any challenges which might arise with any data they are not entitled to use on project completion. Sharing data between stakeholders is key to achieving successful outcomes, but may prove problematic if issues of data sovereignty or data ownership are not dealt with at the outset. In addition, with the use of AI, any issues of copyright and intellectual property rights must be addressed.

#### ***Data governance: security and privacy***

As data sharing between stakeholders is essential at various stages of the PPP process, data security and data privacy may become more challenging. It is important to establish best practises in IT security, cloud computing and access management/permissions, implementing and prioritizing cybersecurity measures as a top priority. Protecting data privacy is crucial to safeguarding individual's rights, ensuring that personal information is not misused or accessed without permission.<sup>19</sup>

#### ***Identification of data***

Public authorities need to identify data that the private sector ultimately requires, and incorporate this in bidding documents and specifications. Incorporating reference at the outset to data needed for reporting and disclosure requirements with respect to the SDGs can avoid delay and additional cost. This can also facilitate private sector financing from SDG oriented funds (climate funds). Furthermore, if public authorities require specific data to be included at hand back, this should also be identified in bid documents to minimise disputes.

#### ***Type, quantity and quality: not all data is “good” data***

Having too little data, too much data or unstructured data may hinder objectives and the success of projects, or even cause delay. Understanding the data available and any data management, data cleansing, data ordering and/or data mapping activities should be put in place to surface insights from data and to use data effectively.

#### **Case Study 1 – United Arab Emirates, Data Standards Initiative<sup>20</sup>**

In 2024, Digital Dubai launched an initiative to raise the level of data standards in respect of quality, accessibility and governance.

### **C. Digital tools for the Public-Private Partnerships lifecycle**

Adopting a holistic approach to digitalization throughout the project lifecycle is essential, particularly given the urgency to accelerate the early stages of project development. A range

<sup>19</sup> For one example of the issues to consider regarding data governance, see [Data Governance Practices in MENA : Case Study - Opportunities and Challenges in Morocco \(worldbank.org\)](#)

<sup>20</sup> See [Digital Dubai Launches Initiative to Enhance Data Quality, Aligning with Highest International Standards](#). For detailed descriptions to all case studies in this guide, refer to Annex II.

of digital tools is now available to support public authorities and other stakeholders in ensuring that PPPs align with the SDGs, many of which are available at no cost.

### **SOURCE**

In 2014, MDBs undertook a joint initiative to create and finance the multilateral platform SOURCE for digitalizing infrastructure and PPP preparation.<sup>21</sup> The platform is coordinated by the Sustainable Infrastructure Foundation (SIF) on behalf of MDBs, offers an integrated digitalized workflow for every stage of the project cycle, enhancing efficiency and multi-agency and multi-stakeholder collaboration. SOURCE provides a globally standardized framework for PPP pipeline and investment for generating well-prepared projects that facilitate bankability and access to investors.

On a global scale, the systemic potential of SOURCE has been underlined by the G20 countries in 2022.<sup>22</sup> SOURCE is also acknowledged and supported by many international bodies such as G7, OECD, IMF, and other international institutions and organizations. It is also supported by the UN Inter-Agency Task Force on Financing for Development and by many UN agencies (UN DESA, HABITAT, UNCITRAL).<sup>23</sup> The ECE works very closely with SIF to further implement the ECE Guiding Principles.<sup>24</sup>

SOURCE is designed to support the:

- (i) Development of well-prepared project pipelines to bridge the infrastructure gap;
- (ii) Digitalization agenda of governments globally;
- (iii) Global standardization of sustainable infrastructure project preparation and management on world scale, across countries and sectors; and
- (iv) Mobilization of private finance for infrastructure projects across the world.

SOURCE is designed for both traditional procurement and PPPs. It provides a comprehensive project preparation and management throughout a project's lifecycle, for all sectors, enabling a well-prepared pipeline of projects, and provided for free to developing countries.

The platform provides a digitalized workflow for infrastructure and PPP preparation at each stage of the project cycle. SOURCE is therefore key to reaching financial close and fulfilling the SDGs, by facilitating an early identification, evaluation and allocation of the projects risks and impacts, while enabling the monitoring of Key Performance Indicators (KPIs) during implementation.

SOURCE offers a common framework, engaging standardization on a global scale, incorporating international best practices and private sector requirements, which is adaptable to each country's processes and is interoperable with complementary IT systems. The platform strengthens the capacity of project developers to package sustainable infrastructure projects and address issues such as the interfacing of multiple stakeholders, ownership of the data, and the legal protection and technical security of data. Indeed, SOURCE data are the sole property of governments and only accessible under controlled permissions or when published, guaranteeing data security, sovereignty and immunity. SOURCE is led and financed by the MDBs and delivered as a global public good to their members countries. The technical assistance provided by SIF to adapt SOURCE to each country's context is financed by MDBs or bilateral donors.

The international community recognises the value of SOURCE to avoid duplication. Its systemic potential is to be further developed and scaled-up in countries lacking expertise in developing quality infrastructure projects, to enable transparency and speed of information for all stakeholders.<sup>25</sup>

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<sup>21</sup> See [SOURCE - Source \(sif-source.org\)](https://sif-source.org).

<sup>22</sup> See [SOURCE Highlighted For 'Systemic' Potential by the G20 Finance Ministers and Central Bank Governors](#).

<sup>23</sup> See [UN DESA and SOURCE](#), [UN HABITAT and SOURCE](#), [UNCITRAL and SOURCE](#).

<sup>24</sup> A lighter version of PIERS is in SOURCE to help with its wider dissemination and use.

<sup>25</sup> See [OECD and G20 | OECD](#).

For successful PPPs, public authorities should consider the use of SOURCE for preparing their infrastructure and PPP programme of projects to enable digital transformation and successful infrastructure projects which achieve the SDGs, along with enhanced access to private finance.

#### Case Study 2 – SOURCE, Success Stories<sup>26</sup>

In March 2024, SIF published six success stories from the countries where SOURCE has achieved a complete integration.

#### *Fiscal transparency and sustainability tools*

Digital tools are also available to assist in identifying fiscal risks in PPP projects and assessing the need for risk mitigation measures. Private financing often leads to the creation of a stock of hidden public debt (off-balance sheet). Since this debt is generally not accounted for and included in the amount of the national public debt, it raises the potential of public finance crises, macroeconomic unsustainability at the national level, and some degree of systemic risk for financial markets at the global level. Hence, public authorities should prioritize a fiscal transparency approach to properly account for off-balance sheet debts resulting from PPPs.

One such example is the International Monetary Fund (IMF)/World Bank’s digitalization tool PPP Fiscal Risk Assessment Tool (PFRAM). PFRAM helps countries manage their fiscal transparency and the reporting of off-balance sheet debt resulting from PPPs. It is an analytical tool to assess fiscal costs and risks arising from PPP projects, designed to assist governments in assessing fiscal implications of PPPs, as well as in managing these projects proactively. PFRAM helps to understand better the medium- to long-term fiscal implications of PPPs.<sup>27</sup>

With respect to macro-economic sustainability of infrastructure projects, the IMF has developed the Public Investment Management Assessment (PIMA)<sup>28</sup> and Climate-Public Investment Management Assessment (C-PIMA)<sup>29</sup> digitalization tools and provides technical assistance for their implementation. PIMA is a comprehensive framework to assess infrastructure governance practices for countries at all levels of economic development, while C-PIMA helps governments identify potential improvements in public investment institutions and processes to build low-carbon and climate-resilient infrastructure.

## D. Communication and transparency

The use of digital tools for clear, accessible and transparent communication with all stakeholders and the wider community is key for timely progress and success at every stage of the project.

During the project identification and development stages, it is essential to publish and disclose key details on central, publicly available websites, with links to relevant documents. Doing so not only addresses transparency and fairness but also enables proper project preparation allowing stakeholders to be informed and take part early on. This transparency allows stakeholders to plan effectively, and contractors can prioritize and manage their work pipelines and supply chains. Similarly, financial institutions may use such digitalized information to plan their participation.

Providing this clarity of project pipeline early during the identification stage helps public authorities best manage affordability and budget issues, the private sector to line up projects and manage their PPP investment portfolios, and construction companies to also manage their own work backlog and subtrades availability. Maintaining it throughout the development and

<sup>26</sup> See [SOURCE-Success-Stories\\_2024-s.pdf](#) ([sif-source.org](#)).

<sup>27</sup> See [Public-Private Partnerships Fiscal Risk Assessment Model \(PFRAM\) \(2019\) : Version 2.0 | Public Private Partnership](#) ([worldbank.org](#)); [PFRAM2.pdf](#) ([imf.org](#)).

<sup>28</sup> See [What is PIMA](#) ([imf.org](#)).

<sup>29</sup> See [Climate PIMA](#) ([imf.org](#)).

implementation stages provides clear communication and has the potential to manage expectations and community involvement.

Transparency is also a key requirement within government, and across public agencies. First, fiscal transparency is essential for accountability and reporting of the off-balance sheet sovereign debt and contingent liabilities resulting from private financing of infrastructure project, as provided for assistance by the PFRAM tool. Second, transparency within government of infrastructure projects is key for national public authorities to best articulate public investment policy along with the country's macro-economic strategy, the long-term public finance trajectory, sectoral policies, and green transition strategy, as is provided for by the IMF with the PIMA and C-PIMA tools.

#### **Case Study 3 – Canada, Infrastructure Ontario Database<sup>30</sup>**

One significant factor which helped the Province of Ontario in Canada to accelerate its PPP leadership was its open and transparent disclosure from very early stages of PPP projects.

### **E. Law, regulation and policy**

For digital transformation to succeed, national laws, regulations and policies must be aligned to create an enabling environment, and do not prohibit or contradict digitalization. ECE and UNCITRAL have developed model legal frameworks and legislative provisions respectively on PPPs as a support for countries.<sup>31</sup>

Public authorities should ensure that relevant laws and public policies exist to support the implementation of PPP projects and programmes that support the SDGs, and that any obstacles and inconsistencies are addressed before implementation. In addition, proposed PPP programmes need to align with public values (for example, in relation to citizens' willingness to accept facial recognition) and realistically align public sector needs with private sector competencies.

Specifically, as AI is set to reshape the delivery of infrastructure projects, it is important to ensure that the regulatory framework governing AI's integration, as well as data privacy and data security policies, is robust and responsible (for example, the EU AI Act 2024<sup>32</sup> and the UK AI Framework<sup>33</sup>).

#### **Case Study 4 – United Kingdom, Legal status regarding smart contracts<sup>34</sup>**

The Law Commission's and LawTechUK's publications 2021 and 2022 are an important step for the digital transformation of the UK infrastructure and construction industry, providing much needed guidance as there had been some debate in the UK regarding their legal status.

### **F. Adoption and cultural change**

By nature, digital transformation involves a shift in culture and change from traditional ways of working. This can prove challenging for some organizations. Public authorities need to create an enabling environment, promoting change and innovation, with leadership driving strategy.

New digitalization initiatives must also be monitored to ensure new processes, digital tools and ways of working are adopted and implemented. To do so, adoption plans should be

<sup>30</sup> See [Infrastructure Ontario Projects](#).

<sup>31</sup> See [ECE Standard on Public-Private Partnerships / Concession Legal Framework in support of the Sustainable Development Goals and its Accompanying Guide, 2023](#); [UNCITRAL Model Legislative Provisions on Public-Private Partnerships, 2020](#).

<sup>32</sup> See European Parliament, [Artificial Intelligence Act](#).

<sup>33</sup> See [A pro-innovation approach to AI regulation: government response - GOV.UK \(www.gov.uk\)](#).

<sup>34</sup> See [Smart contracts - Law Commission](#).

formulated which satisfy the objectives of consistency, interoperability, efficiency and value for money in a project-specific “digital transformation tool kit”.

In addition, authorities need to review the effectiveness and efficiency of any digital transformation initiative to ensure the tools are being used on early projects, and apply lessons learnt on subsequent projects.

Countries using SOURCE have often agreed to enact legislation making it mandatory for all infrastructure projects to be prepared in this new digital framework to facilitate a collective transition. This approach also takes into account the local culture and practices, which are further supported through dedicated training.

## **G. Leadership**

Implementation and adoption of digitalization will only be successful with the drive, vision, oversight and involvement of the leadership within an organization. Effective leadership has the potential to drive alignment throughout an organization, so that digital strategies are effectively integrated with the organization’s goals and objectives. Leadership also has the potential to foster a culture which embraces change and innovation, and therefore adoption. Vision and direction are key for digital transformation and navigating any complex decisions, politics and/or investments required.

Authorities must allocate experienced and competent leadership resources to develop credible and realistic business cases and procurement documentation, and lead the digitalization initiatives throughout the identification, development, implementation (including operation and hand back) of the project.

## **H. Capacity building, talent and training**

Governments must have the requisite capacity to enable digitalization throughout all stages of a PPP programme. Finding talent, particularly in relation to AI tools, can be difficult and therefore upskilling and re-skilling may be necessary. Talent development and capacity building must be part of the strategy for digital transformation and, in particular, for any implementation of AI.

In addition to digitalization, a better understanding by governments of private sector requirements with regard to infrastructure investments early on in the process is key for successfully attracting private sector participation. Authorities must evaluate the capacity of their organization, as well as the market economy, for designing, delivering, operating and financing its programmes and projects. Where necessary, establish a programme to build the relevant capacity and train the authority and market participants in the intended programme. In that respect SOURCE, PFRAM and PIMA have been designed precisely for capacity building development in developing countries, in the form of a global public goods along with technical assistance and training fort their implementation and use.

### **Case Study 5 – G7 Sustainable Infrastructure Fellowship Program<sup>35</sup>**

The Sustainable Infrastructure Fellowship Program is a G7 initiative for global capacity building and training.

## **I. Digital infrastructure**

Digital transformation is only possible if the underlying technical infrastructure is in place. Authorities need to invest in and develop the technical infrastructure and environment necessary to support the proposed transformation.

In terms of technical infrastructure, with regards to the delivery of the PPP programme, public officials have the option of using SOURCE at no cost. They should also invest in and/or build

<sup>35</sup> See [Sustainable Infrastructure Fellowship Program celebrates success of its first cohort in Toronto - Investor Leadership Network](#).

the required software, platforms, servers and/or data centres needed, as well as establishing technical support throughout the project. Consideration should also be given to the required bandwidth, grid power capacity, or other infrastructure needed to support the transformation.

In particular, data centre capacity shortage may be problematic for AI development and adoption. Training and using AI data sets requires increased power consumption and high-power density. Innovative and safe solutions for power, cooling and infrastructure requirements for data centre facilities must be considered as part of the overall digital infrastructure strategy.

IT systems should embrace an approach that allow for real-time data capture and the seamless ability to securely access and share data (needed for decision-making) and consider having a secure, centralized cloud-based platform to enhance this real-time collaboration and data-sharing.

#### **Case Study 6 – Rwanda, Smart Rwanda 2020 Master Plan<sup>36</sup>**

A national ICT strategy focusing on increased private sector participation in ICT infrastructure investment and development through PPPs to spur job creation and economic growth, including a 25-year agreement between the Government of Rwanda and Irembo to digitalize and maintain public services on a single window platform.

#### **Case Study 7 – Netherlands, Smart-City Initiative<sup>37</sup>**

A PPP with the goal of transforming Amsterdam into a leading smart city by leveraging innovative technologies to enhance energy efficiency, mobility, and overall urban management.

## **J. Cybersecurity and sovereignty over the data**

Cybercrime is a significant threat to public services, organizations and society in general. As PPP and infrastructure projects often involve large-scale infrastructure, they can become prime targets for cyberattacks. Safeguarding sensitive data and ensuring the continuity of critical services is essential in PPP projects.

Enhancing cybersecurity measures can prevent data breaches, reduce the risk of service disruptions and protect against financial and reputational damage. Furthermore, robust cybersecurity frameworks in PPP projects foster trust among stakeholders, encouraging further investment and collaboration in public infrastructure. This commitment enhances operational resilience and therefore should align with broader national security strategies, ensuring that public assets remain secure.

Public officials should also ensure their full ownership and sovereignty over their infrastructure data, both in their technical and legal aspects. In that respect cautiousness with the role of private service providers is an important requirement. With respect to both data sovereignty and cybersecurity, SOURCE provides a strong guarantee to governments as the data is stored in secure UN servers.

## **K. Artificial intelligence**

AI is one of the key issues facing the infrastructure industry today. It has the immense potential to accelerate progress across all SDGs<sup>38</sup> and assist the industry as a whole to overcome some of our toughest challenges, including climate change, safety concerns, labour shortages and cost and schedule overruns. AI also carries risks which must be carefully considered, both before and during any utilization of AI tools.<sup>39</sup> Without the appropriate

<sup>36</sup> See [Rwanda Smart City Master Plan | The Atlas of Urban Tech](#).

<sup>37</sup> See [Home - Amsterdam Smart City](#).

<sup>38</sup> See [Pact for the Future](#), Action 27, paragraph 51.

<sup>39</sup> See [UN, Governing AI for humanity \(final report\)](#).

safeguards in place, in addition to ethical and security considerations, AI risks widening the digital divide, further exacerbating poverty and productivity gaps.<sup>40</sup>

This guide does not cover the specific opportunities and risks of AI for PPPs for the SDGs in detail. However, given it is a digital tool which is set to disrupt, enhance and optimize PPPs for the SDGs, most of the general rules for success and the key recommendations outlined in this guide are directly applicable for the use of AI. In addition, some specific references regarding the use of AI in the PPP stages are included in the sections below.

As AI is a technology here to stay, and is developing at pace, it cannot be ignored. It is important for governments to establish an AI strategy in relation to its PPP programme and consider how to operationalize responsible AI. There are various guides and toolkits now available for AI governance, notably, the G20's recently released "Toolkit for Artificial Intelligence Readiness and Capacity Assessment."<sup>41</sup>

## IV. Project identification stage

Project identification refers to the concept stage of the project (that is, the original idea for the project) when pre-feasibility studies are conducted. During this stage, the public partner sets forth its ideas, strategy and objectives for the project, and conducts both stakeholder engagement and government approval processes.<sup>42</sup> Unfortunately, this stage notoriously suffers from delays and bottlenecks.

This section explores how digital transformation and the strategic use of data and digital tools can significantly improve this stage of the PPP lifecycle. Specifically, it examines how these technologies can assist with project identification and assessment, enhance stakeholder engagement and public participation,<sup>43</sup> and expedite government approval processes. By leveraging these tools, these processes can become more productive, transparent, inclusive and accountable, ultimately leading to a swifter and more efficient project development and minimising costs and delay.

### A. Project identification and assessment

In the project identification and assessment stages, public authorities can leverage a variety of dedicated digital tools in order for PPP projects to align with the SDGs from the outset. These include, but are not limited to:

- **Feasibility and forecasting tools:** to identify and communicate viable opportunities swiftly, assess market demand and conduct feasibility studies more efficiently;
- **PFRAM:** to assist for enhancing fiscal transparency of PPP, in providing a digital process and technical framework for reporting off-balance sheet sovereign debt resulting from PPP, as well as contingent liabilities (e.g. government guarantees), along with providing an analytical tool to assess fiscal costs and risks arising from PPP projects;
- **PIMA and C-PIMA:** capacity building tools for national public authorities to best articulate public investment policy along with the country's macro-economic strategy, the long-term public finance trajectory, sectoral policies, and green transition strategy,

<sup>40</sup> See [Digital Progress and Trends Report 2023 \(worldbank.org\)](https://www.worldbank.org/).

<sup>41</sup> See [p4-g20-dewg-brasil-2024-toolkit-for-ai-readiness-and-capacity-assessment.pdf \(www.gov.br\)](https://www.gov.br/p4-g20-dewg-brasil-2024-toolkit-for-ai-readiness-and-capacity-assessment.pdf)

<sup>42</sup> See [ECE/CECI/2023/4](https://www.ece.org/ceci/2023/4).

<sup>43</sup> This Guide only focuses on the role of data and digitalization in enhancing stakeholder engagement and public participation. The Working Party has convened an expert group to prepare a Guide specifically on stakeholder participation in PPPs: "Enhancing stakeholder engagement in PPPs for the SDGs" (2025).

- **Interactive guides and assessment tools:** to evaluate the preparation status of a project, such as the European Investment Bank’s ‘*PPPrep*’;<sup>44</sup>
- **Data sharing frameworks:** to improve data sharing between government departments and stakeholders;
- **Comprehensive risk analysis and scenario/sensitivity modelling tools:** to complete project identification and assessment objectively;
- **Data, statistical models and AI tools:** to model various project options, as well as forecasting needs, risk allocation and best/worst case scenarios, to assist with project identification and selection;<sup>45</sup> and
- **Geographical risk tools:** to assess the risks and benefits of a given geographical location.

#### Case Study 8 – Sierra Leone, Mapping Energy Infrastructure<sup>46</sup>

The PPP project used digital tools where simply inputting a project location allows decision makers to drill down on due diligence items such as accessibility, natural risks, quality of wind and sun exposure and many other variables.

Besides SOURCE, which provides the option for governments to use any of the dedicated infrastructure assessment tools (e.g. G20 Quality Infrastructure Investment indicators, key PIERS indicators etc.), there is a plethora of specialized digital tools available. Thus, public authorities and other stakeholders may find it challenging to know which dedicated tools are most useful and will return the greatest value. To minimize wasted costs, poor adoption, and other challenges outlined in Sections 2 and 3, it is first necessary to determine the desired outcomes and objectives before selecting specific digital tools. This approach aligns the chosen tools with the project’s goals, ultimately enabling effective implementation and utilization.

## B. Stakeholder engagement

Effective and inclusive stakeholder engagement is an important ingredient for successful project delivery. Achieving this requires creating a supporting and enabling framework of regulations, procedures, and contractual provisions, as well as incentivising public authorities and private partners to recognise the value of effective and inclusive stakeholder engagement.

Beyond leveraging resources and guidance from international organizations,<sup>47</sup> and as illustrated by the options set in SOURCE, digital tools offer powerful solutions for making consultations more comprehensive, democratic, accountable, open and transparent.

PPPs must collect, track, report and analyse data in the stakeholder engagement and public participation process in order to achieve positive results and align with the SDGs. Digital tools are instrumental in planning and maximising stakeholder engagement and public participation, providing transparent and quality project information and managing public grievances and end user feedback.

### *Dedicated digital tools*

The collection and management of data is fundamental for the success of stakeholder engagement, as is the creation of a data strategy which enables a shared data environment.

<sup>44</sup> See [What we do \(eib.org\)](http://www.eib.org).

<sup>45</sup> For example, identifying the impact of climate change, extreme events and disasters in the immediate and long term can enable an improved procurement processes or flexibilities in contract obligations for climate change-related events. See [EPPPL - European Procurement & Public Private Partnership Law Review: Climate Change Considerations in Public Procurement and Concessions in Bulgaria \(Part I\) \(lexxion.eu\)](#).

<sup>46</sup> See [VIDA use case: Sierra Leone | VIDA](#).

<sup>47</sup> See e.g. [Open Government Partnership | Committed to making governments more open, accountable, and responsive to citizens \(opengovpartnership.org\)](#).



Besides SOURCE, examples of dedicated digital tools which can assist in these activities include:

- **Public websites and chatbots for citizen services:** to disseminate information and improve engagement with the public and project stakeholders;
- **Interactive and/or visualization tools:** to enable the public and stakeholders more easily visualize and understand the proposed projects and their potential benefits;
- **Social media and local community channels:** to reach public stakeholders and the community to provide information and enhance communication;
- **Digital platforms for consultations:** to manage public consultation, collect stakeholder feedback efficiently and provide a public engagement platform which may be able to extend further and reach more stakeholders than traditional analogue methods;
- **AI and other data analytic and measurement tools:** to assess and analyze stakeholder and public engagement feedback and surface insights more quickly;
- **Communication and virtual meeting software:** to hold virtual stakeholder and public engagement meetings and presentations, to enable a wider reach in situations where it is not possible to convene in-person;
- **Reporting tools:** to enable faster and more efficient summarizing and publishing of stakeholder engagement meetings; and
- **Digital platforms for tracking:** to manage, monitor and document, such as plans, schedules, status, and decisions.

### *Challenges*

While the benefits and opportunities created by digital tools are clear, challenges and difficulties may arise, in addition to those that affect PPPs generally.

One of the primary challenges is access to digital tools and devices. Although technology and digital transformation certainly have the ability to reach more stakeholders and public community grounds, it will always be hard to reach groups, for example, who do not use or have access to digital tools and devices. PPPs for the SDGs must be inclusive and leave no one behind. Overreliance on technology could inadvertently exclude some groups, making it essential to identify and map stakeholder capabilities for comprehensive engagement.

Data privacy and citizens' or stakeholders' data protection are also critical concerns. When collecting feedback during stakeholder engagement and public consultation processes, if personal data is obtained, it must be kept safely and securely and used in line with the laws and regulations of the country.

Moreover, technology should be considered an enabler, rather than a standalone solution. Engaging stakeholders and the public are more effective when the process is trusted and transparent, and involves human interaction. While a fully digital approach may be appropriate in some situations, it is not always ideal. Technology should complement traditional methodologies, or be used to conduct stakeholder engagement and public consultations in new and innovative ways, rather than replacing human interaction entirely.

## **C. Government approval processes**

Digitalization can facilitate the interaction between the various government entities, as well as provide standard template documents for use across the public sector, to expedite the PPP appraisal process, and to make it more transparent and efficient.

SOURCE provides all inter-agency interfaces for onboarding all the required internal branches of government along with the appropriate gatekeeping processes for decision

making purpose, as required by each country's specific regulations, institutional framework, process and culture.

### *Dedicated digital tools*

As with stakeholder engagement and public participation described above, the collection, management and access to data and its insights is fundamental. Examples of digital tools which can assist in these activities include:

- **Data sharing platforms:** to improve communication and data sharing between different government departments or local authority entities.<sup>48</sup>
- **Financial modelling tools:** to model scenarios and sensitivities.
- **Analytical tools:** to analyze, compare and allocate risk, including funding risk, commercial risks, delivery risk and operational risks, for example, Monte Carlo simulations for predicting outcomes.
- **Evaluation tools:** to evaluate the benefits and value offered by PPPs for the SDGs in comparison to alternative delivery mechanisms such as direct delivery or bond financing, such as business case / public sector comparator creation.
- **Data analytics:** to enable data-led decision-making processes, and ultimately accelerating project approvals.

### *Challenges*

While digitalization offers numerous benefits, particularly in approval processes, it also presents several challenges that must be addressed for project success.

Data silos are a significant issue. Even when the necessary information and data for decision-making exist, they may not be accessible to all relevant stakeholders, or stakeholders may be unaware of the data's existence. This lack of accessibility can hinder data-driven decision-making, leading to delays and bottlenecks.

Cultural change is another challenge, as some government institutions may find resistance to change. Transitioning from traditional ways of working requires cultural change management. Stakeholders may be reluctant to adopt new technologies due to fear of the unknown, potential job losses, or a decrease in control over processes.

Interoperability and standardization also pose difficulties. Different government departments may use different systems and technologies. Achieving interoperability, to enable data-led decision making and a data-led approval process, may prove challenging, requiring standardized data formats and protocols to achieve seamless data exchange and communication. Additionally, developing and maintaining the software itself, along with its cybersecurity concerns and permanent assistance to users, can be very costly and challenging.

Lastly, maintaining objectivity and transparency can be challenging when comparing different delivery options for projects and programmes. The use of digital tools can lead to a proliferation of data and data sources. As part of their digital strategy, public authorities should utilize standardised forms and processes for completing business cases and assessing options.

## **V. Project development stage**

Project development refers to the stage of the project where the detailed shaping of the project occurs through full feasibility, tendering, technical design, legal and financial structuring up until contract signing and financial close.<sup>49</sup> This section considers how digital transformation and use of data and digital tools can assist specifically at this stage of the PPP lifecycle, in the processes of feasibility and design, tendering and procurement, and contract negotiation and contract management.

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<sup>48</sup> See e.g. [DOF launches innovative Digital Platform to manage Public-Private Partnerships \(mediaoffice.ae\)](https://mediaoffice.ae)

<sup>49</sup> See [ECE\\_CECI\\_2023\\_4\\_2305092E.pdf \(unece.org\)](https://unece.org).

## A. Feasibility and design

This phase benefits from a focus on engaging in project Cost-Benefit Analysis (CBA), taking into account the valuation of positive and negative externalities (e.g. CO2 emissions). CBA methodology is widely used for infrastructure project design assessment.<sup>50</sup>

This may be helped by developing “public sector comparator” designs or solutions that serve as a baseline to bidders to prepare their proposals. It also includes the design of the PPP project transaction, including the allocation of risk between the private sector partner and the public authority, as well as creating contract and payment mechanisms that reflect this risk distribution.

It is necessary to first define the requirements, deliverables, and outcomes for the subsequent delivery, operation, and hand back phases. However, given the rapid pace of technological advancement, identifying these specifications can be challenging. If not properly addressed, it can lead to missed opportunities and unmet expectations.

Some examples of digital tools which the industry is using to assist in feasibility and design include:

- **Building Information Modelling (BIM):** to enhance the design, construction, project delivery and operational processes including sustainable asset management. It utilizes 3D federated models, which include not only geometrical design information, but also construction information and other parameters. These can link time, cost and asset management software. Some governments now mandate the use of BIM in public projects and standards exist to achieve efficiency and consistency.

### Case Studies 9 and 10 – Use of BIM in PPP Projects<sup>51</sup>

Both the Royal Adelaide Hospital in Australia and the New Karolinska Solna Hospital in Sweden, completed in 2017 as PPP projects, used BIM to enhance project visualization, collaboration, and facility management, with benefits such as improved energy efficiency, cost savings, and optimized construction and operational processes.

### Case Study 11 – UK mandates the use of BIM for publicly financed projects<sup>52</sup>

Since 4 April 2016, the UK has mandated that all publicly procured projects utilize BIM (Level 2) and today, the UK BIM Framework sets out the approach for implementing BIM in the UK.

- **Digital Twins:** to act as dynamic, virtual models of physical assets, enabling designers to simulate and analyze scenarios, as well as monitor performance. Digital twins have the potential to improve predictability and performance and reduce project delivery costs. Studies are now widely available, describing the principles and benefits.
- **Automation Tools:** to automate manual processes and repetitive tasks with rule-based logic, allowing the public sector to better manage priorities and track tasks. Automation of design is possible in some circumstances; however, project management currently is one of the main applications of task automation. In project finance transactions these tools can increase productivity across the entire value chain and reduce the risk of human error.

<sup>50</sup> See European Union, Guide to Cost-Benefit Analysis and the Economic Appraisal Vademecum, 2022 ; and Guide to Cost-Benefit Analysis of Investment Projects, 2015; OECD, Cost Benefit Analysis and the Environment, 2018.

<sup>51</sup> See [BIM Case Study: The New Royal Adelaide Hospital, Australia \(novatr.com\)](#) and [bim-new-karolinska-solna.pdf \(skanska.com\)](#).

<sup>52</sup> See [Government-Construction-Strategy\\_0.pdf \(publishing.service.gov.uk\)](#).

- **CBA, externalities assessment, and risk forecasting and feasibility methodologies and digital tools:** to help with quantitative assessment of positive and negative externalities, the development of business cases and feasibility studies, and the assessment of projects (including their quantifiable impacts and likelihood of risks manifesting and measures that can be taken to mitigate them), consider technologies such as Monte Carlo risk simulations along with CBA.
- **AI:** to assist, for example, with the creation and editing of business cases and reports and the development of design configurations. As mentioned in section III, AI should be used with caution and its output checked.

## B. Tendering and procurement

This phase involves the preparation of tender documents, the tender itself and the selection of a shortlist and preferred bidder. Critical to its success is the selection of a tender list from which any bidder would be capable of delivering the project successfully, and forming a long term partnership with the public entity. Like any public procurement, the process should be run fairly and transparently with the preferred bidder being that which offers the best value for money.

If digital solutions are considered at the project's outset, public authorities can manage and monitor risk allocation, risk sharing and payment mechanisms more effectively. Digital tools can also be used to manage relationships and contracts/contract data, including contract conditions, contract variations, and the management of supply chains and sub-contractors. SOURCE includes a tendering and procurement phase. Since countries often already have some digital framework for public procurement, SOURCE is designed to interface with them.

Some examples of dedicated digital tools utilized at this phase include:

- **Analytical frameworks to assess project readiness:** to assess project readiness prior to launching any public procurement process. Digitalizing internal checklists, or using those publicly available and supported by investment banks, such as the *PPP Project Preparation Status Tool* provided by the European PPP Expertise Centre (EPEC),<sup>53</sup> will assist communication, transparency and project readiness for procurement.
- **AI for due diligence:** to streamline the project due diligence process, through data extraction, cleansing and augmentation technologies to make sense of large and complex sets of data. For example, mapping the key requirements from a technical due diligence report could be done without human intervention. Reducing the manual work and automating the low value-added tasks can enhance efficiency and productivity, whilst also reducing the risk of error, particularly in predictive modelling. Before using any AI for due diligence or other analysis activities, an assessment of its benefit versus its impact and risks should first be carried out.
- **e-Procurement platforms:** to facilitate public procurement process online in the context of the national legal obligations, and possibly to track and objectively compare the relative benefits of different tender solutions in a transparent way, enabling greater accessibility and fairness in contracting and increasing efficiency and effectiveness through standardization.<sup>54</sup>

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<sup>53</sup> See [What we do \(eib.org\)](http://eib.org).

<sup>54</sup> For a review of the critical success factors regarding emerging technology in relation to e-procurement, see [Sustainability | Free Full-Text | From Public E-Procurement 3.0 to E-Procurement 4.0; A Critical Literature Review \(mdpi.com\)](#); see also [Systems and e-Procurement - Improving Access and Transparency of Public Procurement \(europa.eu\)](#).

**Case Study 12 – Ukraine, e-Procurement<sup>55</sup>**

The e-procurement system ProZorro was launched in 2015, developed by a public private partnership based on the Open Contracting Data Standard.

- **A digital framework for using financial modelling:** The use of Word for legal documentation and Excel for financial modelling currently remains the norm in the preparation of PPP projects. Procuring authorities may consider also using digital framework which offer a high degree of automation, thereby reducing manual intervention and the risk of error (for example, in predictive modelling in project finance scenario analysis work). In doing so, procuring authorities could prescribe the financial model for bidding, and bidders would need to justify any deviations. The model itself would be supervised, with a focus on driving project preparation and implementation costs down, whilst the data provided by bidders is unique. The same approach could be used to evaluate alternative proposals presented by bidders.
- **Virtual Data Rooms (VDRs):** to use VDRs and work-flow automation tools, which are widely used in the private sector and have the potential to enhance efficiency, traceability and communication.

**Case Study 13 – VDRs for syndication and trading<sup>56</sup>**

VDRs like DebtDomain and Intralinks are widely used in the syndicated loan market to securely share large documents, providing benefits such as information segregation, controlled access, traceability, and confidentiality, making them useful throughout all stages of a project.

**C. Contract negotiation and contract management**

Further to the appointment of a preferred bidder, there is typically a phase of negotiation, fine tuning of proposals and the securing of finance for a project which should not jeopardise the basis of the selection of the preferred bidder. Digital tools can help ensure that pricing and risk allocation is not impacted during this phase. Examples include:

- **Contract management platforms:** Platforms which digitize the contract and track contract processes for traceability and/or manage contract obligations, risks and the supply chain;
- **Smart Contracts:** Digital contracts stored on a blockchain, which automatically perform contractual obligations in some way.<sup>57</sup>
- **AI for contract completion and contract analysis:**
  - *Automated data extraction and data entry:* to scan contracts and extract key information. This can eliminate the need for manual data entry, enable accuracy in capturing crucial details, and may be particularly helpful in due diligence exercises and/or managing risk across large quantities of similar contracts in the value chain.
  - *Clause identification and analysis:* to identify specific clauses within contracts, such as indemnity clauses, confidentiality clauses, termination clauses, etc., speeding up the process of locating important sections for review.
  - *Monitoring contractual risk:* to assess contractual risk by comparing clauses/contracts against predefined criteria, government/company

<sup>55</sup> See [PUBLIC PROCUREMENT REFORM | Ministry of Economy of Ukraine](#).

<sup>56</sup> See [S&P Global - DebtDomain](#).

<sup>57</sup> See [Smart contracts - Law Commission](#).

policies and/or legal standards/regulations. If an AI system has been trained on a “playbook”, it has the potential to identify whether a clause complies or deviates from the accepted position.

- *Consistency checks*: to detect inconsistencies or contradictions within a contract or between multiple contracts. This can help to align terms and conditions throughout.
- *Cross-referencing*: to cross-reference clauses with relevant legal precedents or regulations.
- *Workflow automation*: to create and manage workflows for contract review by assigning tasks, tracking progress and notifying relevant parties when specific actions are required.

## VI. Project implementation

This guide has emphasized the project identification and development stages, understanding that these early phases are critical for setting the foundation for successful PPP projects aligned with the SDGs. It is equally important to recognize that the success of these projects also relies on the digital tools and strategies applied during the later stages, particularly project implementation. This section, therefore, broadly discusses the final phase of the PPP lifecycle.<sup>58</sup>

Project implementation refers to the construction, commissioning, operations and contract management stages of the project including any variations, termination or hand back at the end of the project. At this stage, the project design and commitments are crystallised, and the public authority is in the position of monitoring performance and compliance.<sup>59</sup>

The use of digital tools during the implementation stage is common, and often extensive, in the private sector but this can vary considerably depending on the specific sector or jurisdiction. This guide does not consider these tools in detail, but rather, provides a brief list of some of the digital tools available.

SOURCE provides a complete digital workflow basis for countries to engage in infrastructure project management along its whole lifecycle, including hand back operations. It thus helps the public authorities build a very rich overall project database over time.

### A. Delivery and commissioning

Some of the dedicated digital tools to consider at this stage include:

- **Contract management with supply chain**: digital contract and risk management platforms to facilitate real-time tracking of contract performance, compliance and milestone. Governments should not use proprietary digital systems that may not be available equally to alternative providers without compromising value for money.
- **Modern Methods of Construction**: known as MMC, technologies covering a range of both offsite and onsite methods which are alternative to traditional methods, providing a more efficient, safer and more sustainable method of construction.
- **Tools to increase efficiency, safety and productivity**: for example, BIM, autonomous robots, cloud computing, 3D printing, the Internet of Things (IoT), Augmented Reality (AR), Virtual Reality (VR), and big data analytics.

<sup>58</sup> For more resources on digitalization in infrastructure projects at the implementation phase see, e.g. [How artificial intelligence can unlock a new future for infrastructure by FIDIC - Issuu](#); [The next chapter in construction technology | McKinsey](#); [PPP Contracts in An Age of Disruption \(Download PDF version\) | Public Private Partnership \(worldbank.org\)](#).

<sup>59</sup> See [ECE/CECI/2023/4](#).

Risk and value assessments should be carried out prior to implementation, and a clear allocation of risk and reward established between project parties.

## B. Hand back and operation

Some of the digital tools to consider at this stage include:

- **Tools for transparent and efficient delivery and operation:** for example, for data collection and consolidation, reporting, long-term recording keeping, knowledge management, lesson learned reviews and reports, assessment of new needs and tracking tools to monitor the financial and risk allocations.
- **Operation and maintenance tools:** technologies used for predictive maintenance, facility management and energy management.
- **Automation tools:** for example, for the calculation of deductions for lane unavailability on highway projects, the demand tracking and projection on energy projects, or payment mechanisms for social infrastructure PPP programmes.

## VII. Policy recommendations

The following ten key policy recommendations for governments were developed from the discussion set out in this guide, focusing on tools and methodologies external to ECE, aimed at improving the delivery of PPPs for the SDGs through digital transformation throughout the project lifecycle and help minimise costs for public authorities.

1. **Consider using the multilateral platform SOURCE:** It is designed to facilitate the bankability and private financing of projects, while assisting countries develop their capacity building for infrastructure project preparation and management. SOURCE is comprehensive, neutral, global, and broadly acknowledged by key multilateral organizations, including ECE and other UN agencies.
2. **Establish and embrace a digital strategy:** A well-defined digital strategy enables technology to be seamlessly embedded in infrastructure development, facilitating better risk management and more effective monitoring of project outcomes, and providing timely insights into project performance and potential challenges.
3. **Implement and align legal and regulatory framework:** A comprehensive and aligned legal and regulatory framework is essential for digital transformation. While creating an enabling environment for digitalization, regulations must also safeguard against potential risks such as data privacy breaches and misuse of technology.
4. **Invest in digital infrastructure:** Digital transformation is only possible if the underlying technical infrastructure is in place. Investing in the necessary infrastructure (data centres, grid power, etc) to enable digitalization is therefore key.
5. **Harness data for data-led decision making and address challenges in big data:** Data is essential for digital transformation and achieving the SDGs. Governments, financial institutions, and the private sector need data-driven insights to develop and implement PPP projects. Addressing key data challenges, such as accessibility and security, is critical to ensuring effectiveness and minimizing risks.
6. **Adopt an AI strategy to enable the responsible, ethical and safe use of AI:** As AI is a technology here to stay, and is developing at pace, it cannot be ignored. It is important for governments to establish an AI strategy in relation to its PPP programme and consider how to operationalize responsible AI cognizant of its potential and risks.
7. **Prioritize cybersecurity:** Cybercrime is a significant threat to public services, any organization and society in general. To ensure the government's functions and services are resilient to the cyber threats, prioritize cybersecurity regarding all technology and

implement a cybersecurity strategy for the responsible and safe use of digital tools throughout the PPP programme.

8. **Build talent and increase digital capabilities and skills:** Invest in upskilling or re-skilling the workforce with digital training, embracing new ways of thinking and working to build digital capabilities.
9. **Take advantage of PFRAM and PIMA/C-PIMA:** The multilateral tool PFRAM has been designed by the IMF and World Bank to assist countries develop their capacity building with respect to fiscal transparency of PPP and facilitate reporting of the off-balance sheet sovereign debt and contingent liabilities resulting from private financing. In addition, PIMA and C-PIMA tools can assist national public authorities to best articulate public investment policy in line with the country's macro-economic strategy, the long-term public finance trajectory, sectoral policies, and green transition strategy.
10. **Ensure leadership drives a culture of digital transformation:** Implementation and adoption of digitalization will only be successful with the drive, vision, oversight and involvement of the leadership within an organization. Allocate experienced leadership and resources to develop credible and realistic strategies and documentation, and lead the digitalization initiatives.



## Annex I

[English only]

## Defining digital transformation

Digital transformation is a widely used term, interpreted and defined in various ways.<sup>60</sup> In this guide, ‘digital transformation’ refers to the process of transitioning an organization or sector from an analogue approach, often paper-based, to one that is driven by data and technology, enabling the delivery of services, products and infrastructure in innovative and improved ways. As such, this concept extends beyond the mere adoption of technology, as it is intrinsically linked to creating value and driving growth.<sup>61</sup>

Multilateral advancement on digital transformation have been achieved by the UN Environment Programme with a dedicated work on Digital Public Infrastructures (DPI).<sup>62</sup>

In the context of the present guide, digital transformation is considered synonymous with *digitalization*, which is the transformation of business and sector processes and operations through the adoption of digital technology, creating new opportunities and driving change. This contrasts with *digitization*, which simply involves converting information from a physical format (paper) to a digital one, such as scanning a paper document to create a digital file.

This guide focuses on digitalization, the comprehensive transformation of processes through digital technology. Any reference to digital transformation should be understood as digitalization.

The range of technology available to finance and deliver PPP and infrastructure projects is extensive, continuously evolving, and becoming more globally accessible. Digital tools are integral to every stage of the PPP project lifecycle, interrelating across various activities to enhance efficiency and effectiveness. As shown in figure 3, these tools can be broadly categorized into communication and reporting, evaluation and analysis, management and monitoring, as well as productivity, optimization, and automation—each playing a crucial role in improving project outcomes.

Figure 3: The digital landscape



Source: ECE

<sup>60</sup> See [Digital Transformation - Strategic Guide to IT Transformation \(gartner.com\)](#) and [Digital transformation \(europa.eu\)](#).

<sup>61</sup> See [What ‘digital’ really means | McKinsey](#).

<sup>62</sup> United Nations Environment Programme (UNEP), *Digital Public Infrastructure for Environmental Sustainability*, 2024.

Examples of these digital tools, along with the opportunities and challenges they present for the PPPs for the SDGs are explored in this guide.

Central to all of these digital tools are data and a well-defined digital strategy. To effectively enhance PPPs for the SDGs through digitalization, a digital strategy must be established from the outset, with the importance of data being recognized and integrated throughout all stages and activities of PPP projects. Deeper insights and clearer information are essential for the identification, development and implementation of these projects, achievable only through the effective harnessing and utilization of data.<sup>63</sup>

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<sup>63</sup> See [From Mass Data to Mass Insights > World Economic Forum Annual Meeting | World Economic Forum \(weforum.org\)](#) and [Data Analytics and AI in Government Project Delivery - GOV.UK \(www.gov.uk\)](#).

## List of case studies in the guide

### Case Study 1 – United Arab Emirates, data standards initiative

On 16 July 2024, Digital Dubai launched an initiative with the object of raising the level of data standards in respect of quality, accessibility and governance. The initiative aims to:

*“establish a leading platform for exchanging experiences among government entities and learning about best practices to enhance the quality of data provided on the Dubai Pulse platform. This platform supports informed decision-making at the senior leadership levels and within the broader government ecosystem in the Emirate.”*

The initiative also highlights the digital maturity policy issued by Digital Dubai: a policy encompassing the four key pillars of digital experiences, data management, cybersecurity and information technology governance. The first phase of the initiative includes participation from 11 government entities.

### Case Study 2 – SOURCE, success stories

In March 2024, the Sustainable Infrastructure Foundation (SIF) published six success stories from the countries where SOURCE has achieved a complete integration. The report sets out the context, the rationale for the use of SOURCE, the integration features, the results and the lessons learned for each country: Uzbekistan, Ecuador, Ukraine, South Africa, Angola and Panama.

### Case Study 3 – Canada, Infrastructure Ontario database

One significant factor which helped the Province of Ontario in Canada to accelerate its PPP leadership was its open and transparent disclosure from very early stages of PPP projects starting at the Planning stage, up to Project Completion, as posted on its website.

This early disclosure in the “In Planning” section, made available broadly, helps stakeholders be informed about the process, location, type of project etc. For example, some vertical projects may not impact Indigenous Communities or the community at large, whereas linear projects often do. Showing maps and project location allows impacted parties to be aware. Stakeholder consultation dates are also included on the page, addressing fair dealing best practices.

### Case Study 4 – United Kingdom, legal status regarding smart contracts

With the rise in use of smart contracts, there had been some debate in the UK regarding their legal status and whether such a contract is valid and enforceable. This is important for government, organizations and companies to understand before contracting with the use of a smart contract.

In November 2019, the UK Jurisdiction Taskforce (UKJT) published its legal statement on cryptoassets and smart contracts. It concluded that, in principle, smart contracts are capable of giving rise to binding legal obligations and are enforceable in accordance with their terms. Following this, the Ministry of Justice asked the Law Commission to undertake a scoping study on smart legal contracts, building on the findings of the UKJT legal statement.

In November 2021, the Law Commission published its advice to government. It confirmed that the current legal framework in England and Wales is able to facilitate and support the use of smart contracts without the need for statutory reform, and that current legal principles can apply to smart contracts in much the same way as they do to traditional contracts. The Law Commission helpfully summarized smart contracts and identified that they can take different forms, albeit that, regardless of the form used, the performance or execution of the contract (or a clause / obligation of the contract) is by code, i.e. with the use of technology.

The Law Commission set out the main features of a smart contract: (1) some or all of the contractual obligations automated by a computer programme; and (2) the contract is legally enforceable. In addition, the Law Commission reviewed the formation, interpretation and remedies when dealing with smart contracts, and includes a non-exhaustive list of issues that parties may wish to provide for in their smart legal contract.

In February 2022, LawTechUK published “Smarter Contracts”, a report documenting the outcome of its project which identified important examples of how technology is transforming contract use across various key industries. The report sets out case studies which demonstrate digital-first solutions to real-world problems: electronic signatures, contract automation and management, insurance, renewable energy, financial services, trade, sale of goods and services, logistics and transportation, the digital ownership of physical assets, sport sponsorship, home buying and selling and the digital company.

The Law Commission’s and LawTechUK’s publications are an important step for the digital transformation of the UK infrastructure and construction industry, providing much needed guidance.

#### **Case Study 5 – G7 Sustainable Infrastructure Fellowship Program**

The Sustainable Infrastructure Fellowship Program is a G7 initiative for global capacity building and training. The goal of the program is to provide public and quasi-public sector officers, multilateral banks and the private sector with the necessary knowledge and skills to deal with private investment in infrastructure following best practices and to make projects “bankable” from an investment perspective, through the use of virtual classes. Fellows are awarded a Masters Certificate in Sustainable Infrastructure Development and Finance with 67 (largely government officers) having graduated from the program across 22 countries (largely in the global south) during the first three years of the program.

It is a combined initiative of the Government of Canada, large global infrastructure investors who share best practices and the Schulich School of Business, York University in Toronto. Virtual classes are a good example of using technology for stakeholder engagement where the channel is open for further communication and collaboration. Specifically on the use of technology, the programme involved guest speakers which included representatives from the SOURCE on project digitalization. Digital twinning and the use of AI for demand modelling were also part of innovation-centered discussions. Program participants bring a wealth of knowledge on technologies being used in their respective jurisdictions to share best practices with the group.

#### **Case Study 6 – Rwanda, Smart Rwanda 2020 Master Plan**

A national ICT strategy focusing on increased private sector participation in ICT infrastructure investment and development through PPPs to spur job creation and economic growth, including a 25-year agreement between the Government of Rwanda and Irembo to digitize and maintain public services on a Single Window platform.

Digital transformation: Multiple smart initiatives including citizen access to public services, a one stop shop platform for development permitting, wifi and contactless payment on public transport, digital pollution mapping, SMS reporting of education data, smart utility meters, drone deliveries, an infrastructure geoportal and 4G LTE.

Lessons learned: (1) need for continuing high level political championship; (2) resource mobilisation to implement the policy and plan to deliver multiple initiatives and projects; (3) stakeholder participation in policy and plan development process to ensure buy-in and acceptance of the need to pursue an ICT4D agenda; and (4) a clear vision, mission and strategy and a well-scheduled execution plan with a step-by-step approach including specific milestones and expected outputs are crucial.

Overall, attaining a higher ICT maturity level is hindered by low accessibility – inadequate distribution of key backbone networks, cloud, and other access channels. Further, acceleration of growth is constrained by lack of an effective ICT implementation organization.

#### **Case Study 7 – Netherlands, Amsterdam Smart City Initiative**

The Amsterdam Smart City initiative is a PPP, comprised of 20 permanent partners including government, knowledge institutions, social organizations and innovative companies active in the Amsterdam Metropolitan Area. The Smart City goal is to transform Amsterdam into a leading smart city by leveraging innovative technologies to enhance energy efficiency, mobility, and overall urban management.

Digital strategy and infrastructure components include sustainable energy management, intelligent transport systems, open data platform and ‘living labs’.

### **Case Study 8 – Sierra Leone, mapping Sierra Leone’s energy infrastructure**

VIDA is a subscription-based software where simply inputting a project location allows decision makers to drill down on due diligence items such as accessibility, natural risks, quality of wind and sun exposure and many other variables. This tool is currently used by the IFC and the World Bank.

A data-led approach to risk assessment has clear benefits, making statistical data available to decision makers. VIDA can be used without having to incur advisory costs; however, it will not replace detailed due diligence – it cannot replace people and human judgment which are needed to think strategically.

The use of VIDA is an example of technology leapfrogging for rapid infrastructure development.

### **Case Studies 9 – Australia, use of BIM for the Royal Adelaide hospital**

The 800-bed healthcare facility was delivered in September 2017 as a PPP project. The designers used BIM for improved visualization and collaboration, clash detection, design optimization, improved energy efficiency, efficient project documentation, construction and management, improved scheduling, a single point of truth for real-time information on progress and resource management, enhanced safety, cost savings, improved construction quality, reduced waste, operation and maintenance, improved facility management, asset management, emergency planning and response and predictive maintenance.

### **Case Study 10 – Sweden, use of BIM for the New Karolinska Solna hospital**

The New Karolinska Solna PPP hospital project was completed in 2017. BIM was used for production calculations and quantity take-offs and physically marking teledata, and became the basis for facility management. The PPP partner noted this project was its first project to have BIM requirements in the contract, meaning it had to work in BIM and contractually deliver BIM models with information inked to databases and will provide information for FM services and future reconstruction.

### **Case Study 11 – UK, use of BIM for publicly financed projects**

In 2011, the government’s construction strategy introduced the mandate that all government projects utilize a fully collaborative 3D computer model (“Level 2”) by 2016, with all project and asset information, documentation and data being electronic. This came into effect on 4 April 2016. Today, the UK BIM Framework sets out the approach for implementing BIM in the UK, using a suite of published standards, guides and other resources for managing information provided by the ISO 19650 series. It is referenced in key UK policy documents such as the *UK Construction Playbook, Trust and Productivity* and the *Transforming Infrastructure Performance: Roadmap to 2030*.

### **Case Study 12 – Ukraine, e-procurement**

The e-procurement system ProZorro was launched in 2015. It has been developed by a public private partnership based on the Open Contracting Data Standard. It has been estimated to have saved USD 1.5 million of public funds in the first three month of piloting.

Digital transformation: Using e-procurement tools increases accessibility to, and fairness of government contracting. The digital approach increases efficiency and effectiveness of public procurement through standardisation of the process and more competition. It is helpful to have legislation, regulation and policy in place that allow or mandate the use of electronic methods and instruments for public procurement.

Lessons learned: (1) consistent coverage of the public procurement cycle across all levels of government, (2) a user-friendly approach, with tools that are easy to understand and use systems that ensure privacy, security of data and authentication, and fair treatment; (3) integration with existing systems such as financial management information system; (4) capacity development for users (government agencies and bidders/suppliers); (5) clear communication to promote awareness and acceptance among users.

### **Case Study 13 – Virtual data rooms for syndication and trading**

VDRs such as DebtDomain and Intralinks are widely used by private sector stakeholders for the communication of large documents to a wide group of lenders. DebtDomain and Intralinks have been in use for a long time in the syndicated loan market. They allow for segregation of information and control of access, read and write rights on a project by project basis. This has the benefit of traceability and confidentiality, as sending the same documents by email is less secure and does not allow for an audit trail of who has accessed the document or not. The use of VDRs for dissemination of documents could benefit all the stages of a project, from preparation to implementation to monitoring. Given the abundance of providers, the public sector also has the choice of platform and can create a healthy competitive tension between providers.

**Annex III**

[English only]

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