

# Initial Report on Output Specifications for Quality Infrastructure PPP Projects

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# Contents

<b>1</b>	<b>Introduction</b>	<b>1</b>
1.1	Scope	1
1.2	Quality Infrastructure	1
<b>2</b>	<b>Public-private partnership (PPP) development and output specifications</b>	<b>3</b>
2.1	What is a PPP?	3
2.2	What is an output specification?	3
<b>3</b>	<b>The global PPP experience and alignment with Quality Infrastructure</b>	<b>6</b>
3.1	The United Kingdom and Europe	6
3.2	Canada and United States	9
3.3	Africa, Asia and the Middle East	13
<b>4</b>	<b>Methodology outline – phase two</b>	<b>16</b>
<b>Tables</b>		
Table 3.1	Output specifications and alignment to QI – UK and Europe	7
Table 3.2	Output specifications and alignment to QI – Canada and the United States	10
Table 3.3	Output specifications and alignment to QI – Africa, Asia and the Middle East	13
<b>Figures</b>		
Figure 1:	Output specifications and project development	4

# 1 Introduction

## 1.1 Scope

In 2014, when the G20 Leaders called for the establishment of the Global Infrastructure Hub (GI Hub), one of the assigned mandates was for the GI Hub to develop a series of ‘leading practice’ tools and guidance notes which governments could use to improve their infrastructure programs. This particular guidance note is designed to assist governments in developing ‘output specifications’ for quality infrastructure public-private partnership (PPP) projects.

PPP projects are based on a collaboration between governments (as the procurers of infrastructure assets) and the private sector (as the designers, constructors and operators of those assets). One of the key distinctions between a PPP project and a traditional ‘public works’ contract is that, in a traditional ‘public works’ contract, the government engages a contractor and provides that contractor with “input specifications”, i.e. a detailed description of the work that the contractor must perform in building the infrastructure asset. In contrast, in a PPP transaction, the government specifies the “output specifications” that the private sector must follow, i.e. the key performance indicators (KPIs) that the infrastructure asset must achieve. By this means, governments can take advantage of the private sector’s expertise to develop innovative and efficient solutions to meet the government’s objectives.

There is a considerable body of knowledge that already exists regarding how to draft input specifications for traditional ‘public works’ projects with a view to achieving a high degree of quality in the resulting asset. However, the GI Hub believes that there is less understanding of how to properly draft output specifications to achieve a quality PPP project. This **Guidance Note on Output Specifications for Quality Infrastructure Public-Private Partnership Projects** (the Guidance Note) is designed to improve the global understanding of this subject, to help governments that wish to provide their citizens with quality infrastructure assets and services.

To develop the Guidance Note, a two-phase process is underway, with this Initial Report documenting the first phase. Specifically, this Initial Report provides:

- details of the current work and current level of incorporation of Quality Infrastructure (QI) focus areas in the development of output specifications (Section 2 of this Initial Report);
- an introduction to the real-world, practical experiences in this area (Section 3 of this Initial Report); and
- a description of the methodology to be followed in preparing the final Guidance Note (Section 4 of this Initial Report).

## 1.2 Quality Infrastructure

The G20 Leaders stressed the importance of QI Investment at the Hangzhou Summit in September 2016, where it was defined as investment:

*“which aims to ensure economic efficiency in view of life-cycle cost, safety, resilience against natural disaster, job creation, capacity building, and transfer of expertise and know-how on mutually agreed terms and conditions, while addressing social and environmental impacts and aligning with economic and development strategies”<sup>1</sup>*

This all-encompassing definition considers several focus areas to be fundamental to the development of QI, including:

- the sustainability and longevity of an infrastructure asset;
- the ability of the asset to withstand natural and other disasters;
- the ability of the asset to meet the expectations of end-users;
- social and environmental impacts;
- health and safety considerations during both the construction and operation of the asset;

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<sup>1</sup> G20 Leaders’ Communiqué, Hangzhou China (4-5 September 2016), <https://www.g20.org/en/g20/timeline>

- social inclusiveness and job creation;
- the ability of the asset to respond to changes in resource availability, population levels and demographics; and
- the ability of the asset to respond flexibly to the introduction of disruptive technology.

## 2 Public-private partnership (PPP) development and output specifications

### 2.1 What is a PPP?

PPP is a procurement method that uses a long-term contract between a private party (or parties) and a government entity, to enable the provision of a public infrastructure asset. It is not specific to a class of assets or services (rather it is “asset agnostic”), but the projects for which it is used are often categorised into the following two broad classes:

- social infrastructure, such as schools, hospitals, prisons and other infrastructure assets that are directed at providing community services; and
- economic infrastructure and services, such as roads, railways and other infrastructure assets that input to productive processes.

There are numerous forms and levels of complexity associated with the structure of a PPP arrangement, but all look to allocate the required project functions, such as design, construction/build, financing, operations and maintenance, and the associated risks, to the party that can best manage and handle such underlying risk.

For the functions that the private party (or parties) takes on, they are usually remunerated via a user-pays charge or an availability payment mechanism, linked to their performance. As such, a properly structured performance regime is necessary to ensure that the public owner receives the maximum benefit of the deal it strikes with the private partner.

### 2.2 What is an output specification?

An output specification is the mechanism within a PPP transaction which can be used to assist in obtaining the maximum benefit of the project. It is a statement(s) as to the goals or objectives that a project is to meet; however, it does not prescribe or outline how an objective is to be met and is the converse to an input specification, which clearly details what must be put into a project – resources, facilities, equipment - to meet the objective. Specifically, an output specification:

- focuses on the services to be provided and their standard, rather than the nature of the asset or who delivers the service;
- needs to be clearly defined, concise and unambiguous;
- needs to be quantifiable, as it will become the foundation for the indicators against which performance will be measured and payment made; and
- will also measure whether the development is a success.

Determining the level of detail required in an output specification requires striking a balance between:

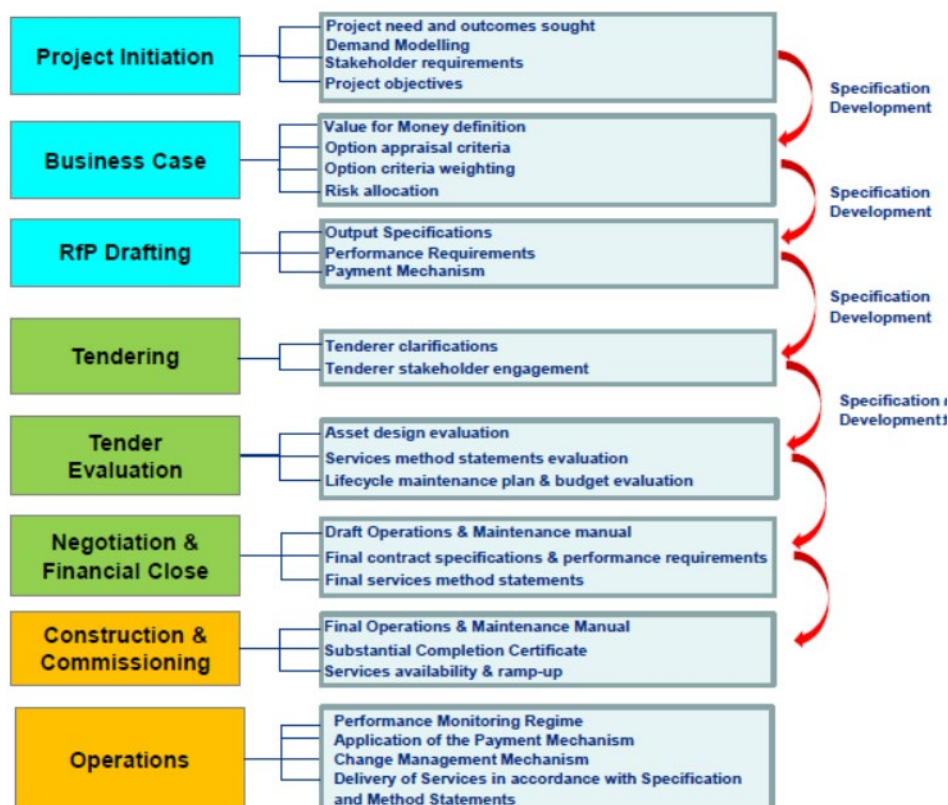
- allowing the private sector scope to generate a Value for Money (VfM) delivery option through innovation and appropriate risk allocation; and
- the complexity of the assessment required to determine the best value for money and select the right party to deliver the project.

Output specifications that are too prescriptive have been shown to dampen innovation and can reduce the level of interest shown by potential private sector partners, whilst those that are too vague are often associated with assets that do not meet the public sectors’ needs.

The diagram below considers each of the main phases for the development of a PPP project, highlighting when and how the output specification should be developed, considered and used. Broadly, this diagram illustrates that the key objectives for a project need to be identified, defined and analysed at the initiation stage and the specifics of the objectives need to be continually refined and communicated to all stakeholders so that they are clear of what needs to be achieved and how success will be measured.



Figure 1: Output specifications and project development



Source: Mott MacDonald

There are six key components required to maximise the likelihood that a PPP project will be successful, which should be considered collectively from the Project Initiation stage through to Operations stage. The output specification has a role in each of these components:

1. Select the *right* delivery model: Via robust, unbiased business cases that recommend a preferred procurement model. The procurement model should be determined through the consideration of a range of qualitative and quantitative criteria and include a provision for the administration of the PPP (or other procurement) contract. This is where the purpose of a project and the basis for the output specification are defined.
2. Identify *specific* requirements: Engage with all stakeholders to identify the specific project objectives and priorities and to develop the scope of services. This may also involve educating stakeholders who are not familiar with the PPP model, the level of requirements to be included in a PPP contract, and/or the trade-off considerations of selecting and using such a model. The output specifications continue to be developed at this stage.
3. *Clearly and accurately* document the requirements: Specification development, including decisions on the level of prescriptiveness, understanding the consequences of the same, and appreciating the interfaces between the various stages of development (from design to construction to service delivery), occurs at this stage.
4. Select the *right* partner: Via a competitive procurement process that includes evaluation criteria which align with the project priorities and are understood by all stakeholders, including assessors and decision-makers. Again, specifications continue to be defined, as it is here that they are questioned, redefined (if necessary) and more widely communicated.
5. *Prepare* for service delivery: A structured approach to the operational readiness phase, including the development and review of plans and establishment of contract administration tools. At this stage, it should be clearly understood what is required and how it will be measured. There should be no ambiguity in the terms of the output specifications.

6. *Consistently assess and deliver* quality services: through good contract administration, ongoing performance management and continuous improvement.

As there can be years between procurement document development and service commencement, project personnel can change, and the understanding of project priorities can be lost. Early and continuous service delivery planning, and the associated output specification development and understanding, should occur to support all phases of the project development process. There should be a clear, ongoing relationship between output specifications, performance standards<sup>2</sup> and payment mechanisms<sup>3</sup>.

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<sup>2</sup> Those performance threshold(s), requirement(s), or expectation(s) that must be met for a project to be considered operating at the level of performance stipulated in the contract.

<sup>3</sup> The commercial arrangement through which the private party is paid for their contribution to the PPP project.

## 3 The global PPP experience and alignment with Quality Infrastructure

The PPP model, as a procurement concept, has been used for many years in various jurisdictions around the world to develop their required public infrastructure and services.

When considering how the focus areas of Quality Infrastructure can be incorporated into future projects, we have outlined some of the current features, mechanisms and trends of several markets, which we have grouped with reference to their similarities. Our analysis is not exhaustive, but rather looks to introduce some of the current practices and gaps when considering PPPs in light of the Quality Infrastructure agenda.

### Global overview

Although a relatively newly defined term, Quality Infrastructure principles (defined as those focus areas considered in this report) have, in some instances, been incorporated into the output specifications of PPP projects for some time. Several global regions have been considered in detail below, but the following themes have emerged across all regions:

- Notwithstanding the global use of the PPP mechanism and the increasing incorporation of the QI focus areas into output specification development in recent times, many current output specifications continue to refer to the established UK frameworks, models and standards that were in use at the height of popularity of the PPP model in the UK in 2010. The specific technology referred to may have changed, but the underlying objectives driving the definition of the output specifications have, in many instances, not materially altered.
- It is increasingly apparent that the output specification itself is only one tool required for successful QI PPP development. The accurate and clear definition of the specification must be supported by clear and well-managed reporting and monitoring standards – which are missing in many regions.
- Some of the focus areas, for example those concerned with the sustainability and longevity of an asset, are aspects of Quality Infrastructure which have been incorporated into the output specifications of PPP projects for some time. Others, such as those associated with technology disruption, are comparatively new concepts that are only just beginning to be developed and incorporated. As an example, the longevity of an asset can be tied to the condition in which it is handed back to the public. As such, an agreement may include a specific handback clause, defining its lifespan requirements, that will be assessed at an agreed interval, by the agreed assessor. Failure to hand the asset back in this condition usually results in a financial penalty.
- In the case of markets with greater access to resources – such as funding, finance, or choice of private sector partners – the incorporation of output specifications aligned to the Quality Infrastructure focus areas is occurring more frequently. For example, South Africa now has an express requirement to include several social inclusiveness compliance requirements in PPP contracts, such as preferential procurement with Small and Medium Enterprises (SMEs) or B-BBEE<sup>4</sup> compliant contracts, which include KPIs and milestones that should be achieved in different stages of the contract.
- The ability of a specific output specification to be readily transferred to another class of asset or region is limited, as many output specifications at present are concerned with the specific regulations, codes and standards of their region of origin. The Guidance Note will, however, illustrate some specific examples.

A summary of the key findings in each specific region is detailed below.

### 3.1 The United Kingdom and Europe

The United Kingdom was one of the first regions to embrace the PPP model, which developed there in the 1990s. It was used extensively until about 2010 (when there was a change in government), and many guiding principles, practices and frameworks were developed in the UK that have become best practice around the world. Standard terms and documents have been developed for numerous PPP elements – including output specifications – and have been refined based on lessons learned. Similarly, as a mature

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<sup>4</sup> Broad-Based Black Economic Empowerment Act (B-BBEE)



PPP market, many of the focus areas of Quality Infrastructure have been adopted as part of international best practice, and as a basis (although not expressly) for output specification development.

In Europe, the PPP sector has built on the UK experience, but standardisation of practices and documents is limited. Development of standard output specifications tends to be fragmented with reference to the specific requirements of the assets and the region of its development. However, in some regions, the focus areas of QI have been incorporated.

The table below summarises some of the observations from the region with respect to the alignment of output specification to the QI focus areas.

**Table 3.1 Output specifications and alignment to QI – UK and Europe**

	Quality Infrastructure Focus Area	Comment
Whole-of-life /Resilience	Sustainability and longevity of an infrastructure asset	<ul style="list-style-type: none"> <li>• Lifecycle risks flow down to the private party, enabling buy-in at the design and construction stage to ensure the best value for money over the life of the contract.</li> <li>• Contractual requirements typically include annual and cumulative five-year lifecycle programs to be provided to the procuring authority.</li> <li>• Some projects require a condition survey to be completed by an independent third party (jointly appointed) to assess condition of the asset as compared to the defined contractual Handback Condition, on the following basis; <ul style="list-style-type: none"> <li>– the specific handback conditions will vary depending on the nature of the asset and the sector;</li> <li>– the assessment, the findings of which would be detailed in a report, can take place either periodically or at the end of the appointment, and should expressly comment on whether conditions and the terms of the specification are/have been met; and</li> <li>– the assessment can be completed via self-assessment in some instances.</li> </ul> </li> <li>• Level of detail for lifecycle programs/plans<sup>5</sup> varies between projects, standardisation could be beneficial.</li> <li>• Where lifecycle risk is retained by the procuring authority (for example Retained Estate or Refurbished Facilities), a VfM review could be required at the time of procurement to ensure the best approach is achieved in terms of quality and value for money.</li> <li>• Lifecycle reviews<sup>6</sup> are often linked only to financing terms – broader application could be beneficial. A typical lifecycle review would cover a review of lifecycle works undertaken compared to budget, works planned for the coming one- to five-year period, costings for the remainder of the concession, and any lifecycle-related reserve fund. an be completed via self-assessment in some instances.</li> <li>• Handback criteria<sup>7</sup>: <ul style="list-style-type: none"> <li>– are not always incorporated into the contract/output specifications;</li> <li>– if they are, they are often vague and vary between sectors and countries;</li> <li>– their range can include: <ul style="list-style-type: none"> <li>○ detailed residual life expectancies across all building elements on some projects (UK Health); or</li> <li>○ simple statements that the facility must be in a condition to continue to meet the existing output specification on handback (Netherlands, France)</li> </ul> </li> </ul> </li> <li>• Typically, the Handback Conditions will include provisions requiring that the facilities will be in such condition that they will achieve their anticipated life span, and that where replaced during the Contract Period, the replacement has at least an equivalent lifecycle to that which it replaces. Fulfilment of this requirement is then measured at the scheduled and agreed review periods, and determined by the agreed assessor. Financial penalties are then incurred if the requirement is not met.</li> <li>• There are, as yet, only a limited number of cases where project assets have been handed back and, therefore, no test examples are available.</li> <li>• Region-wide variations as to the level of sustainability obligations and requirements within PPP deals, for example early UK projects, have limited requirements, but later projects would include a requirement for BREEAM<sup>8</sup> and energy risk-sharing mechanisms etc.: <ul style="list-style-type: none"> <li>– risk-sharing mechanisms for energy consumption currently provide incentives to the proponent to put in place energy-saving procedures;</li> </ul> </li> </ul>

<sup>5</sup> A lifecycle plan consists of an asset register that identifies the replacement value for components of the asset and the projected lifecycle costs over time. It also describes the approach to complete maintenance/renewal (i.e. the level of acceptable deterioration or damage) and any assumptions. The plan is meant to show how the asset will be maintained in accordance with the design and performance criteria, how disruptions to the end user will be minimised and provide comfort that handback risks are being mitigated.

<sup>6</sup> A lifecycle review is a period assessment of whether a project is performing in accordance with the agreed lifecycle plan.

<sup>7</sup> Handback criteria are those that consider whether the asset can meet the output specification at the time of handover. They are set at the commencement of the agreement.

<sup>8</sup> Building Research Establishment Environmental Assessment Method – a sustainability assessment method.

		<ul style="list-style-type: none"> <li>– reporting of energy consumption is required on a monthly or quarterly basis, often with an annual reconciliation of bonus/malus payments at the end of each contract year.</li> </ul>
	Ability of the asset to withstand natural and other disasters	Definitions such as Relief/Compensation Events, Force Majeure and building specifications appropriate to the local climate. For example, Italy, Turkey and Greece include design requirements within the output specifications in relation to earthquake protections that reference the local design requirements and best practice.
Fit for purpose	Ability of the asset to meet the expectations of end-users	<ul style="list-style-type: none"> <li>• The requirements associated with this ability are best incorporated by: <ul style="list-style-type: none"> <li>– ensuring there is a clear intended purpose for the asset and/or parts of the asset within the design specification. As an example, in the case of UK schools, it is common to see incorporation documents such as a “Schedule of Accommodation” which sits alongside the contracted output specification and outlines a classroom’s specific purpose. For a general use school classroom, typical wording would be <i>“to support general teaching within a comfortable environment enabling education activities including teacher supported learning and audio-visual activities.”</i></li> <li>– avoidance of unmeasurable aspirations, for example “provision of a comfortable working environment for up to XX number of staff”.</li> </ul> </li> <li>• Some sectors have a changeable output/purpose/capacity which requires the asset to be “future-proofed” so that it does not become obsolete or over-capacity within the early stages of the concession.</li> <li>• Flexible payment mechanisms allow for payment based on current capacity to be made for some volume-related services, such as soft and clinical services within a hospital (the Turkish Health PPP program provides a good model for this).</li> </ul>
	Social and environmental impacts	<ul style="list-style-type: none"> <li>• Requirement to incorporate procedures which are compliant with the requirements of International Organization for Standardization (ISO)<sup>9</sup> Standard 140001 - therefore providing compliance to a globally recognised quality standard and procedures to be followed;</li> <li>• Requirement for accreditation, rather than just compliance with the requirements of ISO, adds an additional level of monitoring, in that external auditors will review the procedures of the operation and confirm compliance and certify the standard;</li> </ul>
Social and environmental	Health and safety considerations during both the construction and operation of the asset	<ul style="list-style-type: none"> <li>• UK requirement to implement procedures which are compliant with the requirements of ISO Standard 180001 - therefore providing compliance to a globally recognised quality standard and procedures to be followed.</li> <li>• UK requirement for accreditation, rather than just compliance with the requirements of ISO, adds an additional level of monitoring, in that external auditors will review the procedures of the operation and confirm compliance and certify the standard. Adaptation may be required, as local laws and regulations would take precedence, for example, data protection, health and safety, and employment laws.</li> </ul>
	Social inclusiveness and job creation	<ul style="list-style-type: none"> <li>• Large-scale investment projects can provide employment opportunities for local people and procurement opportunities for local suppliers;</li> <li>• Social infrastructure projects, such as schools, can provide the community with opportunities such as access to library, ICT and sports facilities.</li> </ul>
Flexibility	Ability of the asset to respond to changes in resource availability, population levels, demographics and disruptive technology	<ul style="list-style-type: none"> <li>• Variation/change procedure, which allows changes to be requested by either party to improve asset efficiency and performance. This includes changes in law and changes to enable the expansion of the asset, reduction or ‘mothballing’ of parts of the asset and change in use of all or parts of the facility. Changes are typically categorised by value (financial) and have different obligations depending on the size.</li> <li>• Formal procedures to request, review, agree and action a change exist, with procedures for adjustment of the contract and payment mechanism where required.</li> <li>• The procedure can be slow, depending on the reactivity of the parties and the industry; there is a tendency to deliver the requirements of the change under a Deed of Indemnity with the formal change management actions happening once the works/change is completed;</li> <li>• The procedures tend to be consistent within country regardless of sector but need to reflect any regulatory requirements for the asset and regulatory body needs to sign off asset changes.</li> <li>• Some sectors have a changeable output/purpose/capacity which requires the asset to be “future-proofed” so that it does not become obsolete or over-capacity within the early stages of the concession.</li> </ul>

<sup>9</sup> ISO standards are a set of documents that provide measurable requirements, specifications, criteria or characteristics, which can be used to ensure that products or services are fit for their purpose – 9001 is quality, 14001 environment, and 18001 health and safety, but there are many others. They are recognised globally, and output specifications often require compliance with or accreditation to these standards (accreditation is carried out by a third party who will review the procedures and policies in place at a facility or asset to confirm compliance with the specified relevant standards.).

## 3.2 Canada and United States

Like the UK and European markets, the North American P3<sup>10</sup> markets are well-established, having also begun their development in the 1990s. The mechanism is used across all asset classes in the region but has tended to have more of an 'economic' infrastructure focus in the United States, and slightly more of a 'social' infrastructure focus in Canada.

In these regions, the output-based specifications within a P3 contract are structured around meeting the expectations of owners by ensuring particular performance outcomes throughout the lifecycle of the asset. The corresponding performance measures are designed to guarantee a certain level of 'quality' in the delivery of the project, but the approach to quality is often more generic rather than a direct reference to a specific definition. Notwithstanding this, some of the focus areas of QI are considered in PPP projects of this region, as illustrated in the example of the Central 70 Project in Denver, Colorado (which reached financial close in December 2017), where the project goals were defined by the Colorado Department of Transportation (CDOT) as:

- a. Optimise the scope of the transportation and supporting infrastructure delivered through the project to promote corridor-wide economic and community vitality. Specifically, this was incorporated into the contract by removing the existing elevated I-70 Interstate Highway, which divides communities, has significant congestion and is a structurally obsolete structure. The replacement highway will be placed underground, in a sub-surface alignment, and a 1000-foot cover/tunnel is to be added, which will act as a public park and playground for a local school.
- b. Optimise the operating and lifecycle maintenance costs by delivering a project using quality design, materials and techniques. Specific arrangements were defined in the contract with respect to quality control and quality assurance and responsibilities, which were enforced through the performance mechanism and technical requirements.
- c. Minimise impacts to the travelling public, businesses and nearby communities during and after construction. Specific requirements were defined for traffic management and the opening and closing of lanes, response to incidents, etc. and were enforced through the performance mechanism and availability payments.
- d. Once operational, ensure reliable travel speeds in the managed lanes and, for all lanes, a minimum appropriate standard of maintenance;
- e. Utilise a collaborative process to enhance community values and project benefits; and
- f. Protect the safety of the workforce and public – enforced through a mandated compliance with safety standards and the provision of a detailed safety plan.

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<sup>10</sup> P3 is the term more commonly used in Canada and North America for PPP.

The table below summarises some of the observations from the region with respect to the alignment of output specification to the QI focus areas.

**Table 3.2 Output specifications and alignment to QI – Canada and United States**

	Quality Infrastructure Focus Area	Comment
Whole-of-life /Resilience	Sustainability and longevity of an infrastructure asset	<ul style="list-style-type: none"> <li>• Sustainability and longevity are often addressed via lifecycle<sup>11</sup> and durability<sup>12</sup> plans, but they are often not assessed elements for proponent selection:               <ul style="list-style-type: none"> <li>– RFP response requirements include lifecycle plans, which form a contract document.</li> <li>– The lifecycle portion of monthly service payments is based on the lifecycle spending profile of the service provider, established at financial close.</li> <li>– Regular independent assessment (by a third party) of the facilities' condition against lifecycle budget and regular monitoring of the facility condition index<sup>13</sup> during the operating period.</li> <li>– There is usually a mechanism which allows for the performance requirements to be updated by the owner from time- to-time over the duration of the O&amp;M period to allow for changes in standards or work practices that would not have been in place when the contract was made effective.</li> <li>– Clear handback requirement process and mechanisms that also directly impact the proponent's lifecycle plans and maintenance schedules (particularly overhaul), although no project has yet reached the end of its operating term. Also, the duration of the O&amp;M term will impact how the handback requirements are dealt with by the P3 developer. For example, the Central 70 Project (30-year O&amp;M term) residual life of retaining walls is 40 years. Therefore, with a 75-year service life for a retaining wall, at handback after 30 years, the durability plan should be able to demonstrate that it still has at least 40 years of residual life, such that no handback works would be required. However, for a pavement surface with 10 years residual life required at handback, and typically a 25-year service life, there may be a need for renewal works at handback. In such a case, a P3 developer would need to consider more carefully when pavement major maintenance is required throughout the term to optimise OPEX spend, whilst meeting all performance and handback requirements.</li> <li>– Recent examples include the Portsmouth Bypass project, which had a durability plan developed for all structural elements with a service life of 75 years or more, or a residual life of greater than 40 years.</li> </ul> </li> <li>• Sustainability measures are also incorporated in specific environmental protection and efficiency measures. For example:               <ul style="list-style-type: none"> <li>– Energy risk is shared, and Ontario has an increased focus on energy monitoring and reporting with their energy failure mechanism. West Park Hospital in Ontario adopted an updated energy approach, which benefitted from lessons learned of previous projects.</li> <li>– The Surrey Biofuels Facility project in British Columbia received the ENVISION platinum rating in March 2018 for sustainability. ENVISION is an industry tool developed to help evaluate the sustainability of civil infrastructure, and includes design, planning, construction and maintenance elements.</li> <li>– However, improvements to the monitoring and enforcement of the Environmental Management Services scope is required for the sustainability benefits to be fully realised.</li> </ul> </li> </ul>
	Ability of the asset to withstand natural and other disasters	<ul style="list-style-type: none"> <li>• Inclusion of these elements are very asset class- and location-specific and tend to reference local requirements more than a standard approach. Some examples include:               <ul style="list-style-type: none"> <li>– A forthcoming British Columbia bridge project that will be released in 2019 where there will be a resilience requirement, but specific details are not available at this stage.</li> <li>– Many coastal transportation projects or projects near significant water courses are being designed to combat sea level rises and hurricane/major flooding events. For example:                   <ul style="list-style-type: none"> <li>○ The Mobile River Bridge Project (<a href="https://mobileriverbridge.com/">https://mobileriverbridge.com/</a>), on which Mott MacDonald is advising Alabama DOT, requires the P3 developer to design the bridge structures to combat storm surge, flooding, impact from debris and naval/shipping vessels. Example contract text:                       <p style="margin-left: 20px;"><i>Hydrodynamic forces from waves and currents and impact forces from debris collisions will apply to structural elements at a range of elevations due to variance in Mobile Bay water levels. Concessionaire shall design in-water bridge foundations, solid-fill</i></p> </li> </ul> </li> </ul> </li> </ul>

<sup>11</sup> A lifecycle plan consists of an asset register that identifies the replacement value for components and the projected lifecycle costs over time. It also describes the approach to complete maintenance/renewal (i.e. the level of acceptable deterioration or damage) and any assumptions. The plan is meant to show how the asset will be maintained in accordance with the design and performance criteria, how disruptions to the end-user will be minimised and provide comfort that handback risks are being mitigated.

<sup>12</sup> Durability plans address the durability for all residual elements with a specified minimum residual life of 40 years or greater and with a service life of 75 years or greater. The plan includes the maintenance and monitoring strategy and outlines the process for establishing the residual life to fulfil the project requirements and describes a methodology for the replacement of expired residual elements. Contents include: identify each element with corresponding environmental exposure conditions; identify relevant degradation and protective mechanisms; describe measures taken during construction to ensure assumed quality of construction is achieved.

<sup>13</sup> The Facility Condition Index (FCI) is an industry standard asset management tool, which measures the asset's condition at a specific point in time. It is the ratio of the "repair needs" to "replacement value" expressed in percentage terms.

	Quality Infrastructure Focus Area	Comment
Fit for purpose	Ability of the asset to meet the expectations of end-users	<p><i>approach embankments, and abutments to withstand these forces according to Good Industry Practice and the Concession Documents.</i></p> <ul style="list-style-type: none"> <li>- Similarly, in seismic regions, such as California, there are special requirements to deal with seismic events.</li> </ul> <ul style="list-style-type: none"> <li>• The performance mechanisms are standardised (for example, the value of the deductions and step-in and default thresholds), but there is the ability for owners to input KPIs that respond to the operational priorities. Owners can either develop new KPIs or change the category (low, medium, high) of the standard KPIs to reflect their priorities or scope of services. In social infrastructure projects, functional units are assigned categories for the calculation of availability deductions, based on the priority of the space.</li> <li>• A new type of deduction called a 'System Failure' has been introduced, where an important building system is unavailable or is performing poorly, impacting the functionality of multiple functional units. For example, in a hospital, these systems could be the WiFi, the integrated security system, the clock system or the public address system.</li> <li>• Tested, industry accepted approach. Standard mechanisms include the basis for deductions (including bedding-in periods<sup>14</sup>), performance monitoring and step-in, reporting and planning requirements.</li> <li>• There is usually a mechanism which allows for the performance requirements to be updated by the owner from time to time over the duration of the O&amp;M period to allow for changes in standards or work practices that would not have been in place when the contract was made effective. For example:             <ul style="list-style-type: none"> <li>- on a hospital project in Quebec, the functional units and linked units were revised to reflect the actual facility that was built and how it was being used.</li> <li>- on a road project, the government may require skid resistance to be reported using a different measurement scale from that in current use and would be entitled (subject to calibration between new and old measurement scales to demonstrate equivalence of performance, frequency of O&amp;M work and user satisfaction) to require the adoption of an amendment to both the measurement criteria and target for this element.                 <ul style="list-style-type: none"> <li>o Here is some example contract text:                     <p><i>The Department shall be entitled at any time to require the Developer to adopt amendments to any of the Performance Requirements in such Performance and Measurement Table where such amendments are required to comply with then-current Good Industry Practice and under the following conditions:</i></p> <ol style="list-style-type: none"> <li><i>i. the measurement scale associated with the original Measurement Criteria is superseded and no longer complies with Good Industry Practice; and</i></li> <li><i>ii. the new Target shall be determined using the principle that compliance with the new Target shall achieve the same standard of performance, frequency of O&amp;M Work and User satisfaction as would have been achieved through Developer's compliance with the original Measurement Criteria and Target.</i></li> </ol> </li> </ul> </li> </ul> </li> <li>• In British Columbia, if there are soft services included in the P3 contract, a market testing regime is included to allow periodic review of the cost of service delivery. Abbotsford Hospital is approximately 10 years into operations and has recently gone through a market testing process.</li> <li>• Limited guidance during the project development process means uninformed owners either do not understand the importance of developing KPIs that align with priorities, or there is a lack of guidance to show how this is done.</li> </ul>
	Social and environmental	Social and environmental impacts

<sup>14</sup> During a defined period following service commencement, the deductions for quality, service and system failures are reduced while the private sector resolves start-up issues.

<sup>15</sup> <https://news.gov.bc.ca/stories/north-island-hospitals-project-green-bond-issue-a-first>



	Quality Infrastructure Focus Area	Comment
	Health and safety considerations during both the construction and operation of the asset	<ul style="list-style-type: none"> <li>• Clear delineation of 'Prime Contractor' (as defined by local legislation) responsibilities.</li> <li>• Detailed Health and Safety Plans are required and sometimes assessed as part of the proponent assessment - e.g. Central 70 Project.</li> <li>• Some hospitals report a lack of commitment to health and safety procedures by the private sector technicians during the operation of the asset, including, for example, poor infection control measures taken during the performance of maintenance work in kitchens/cooking areas. This is a wider observation regarding the implementation of policies and procedures by on-site staff.</li> <li>• There is improvement to be made regarding the coordination of emergency management plans between the public and private sector (i.e. clear allocation of responsibilities and collaborative approach)</li> </ul>
	Social inclusiveness and job creation	<ul style="list-style-type: none"> <li>• Ontario AFP projects are often unionised (public or private unions).</li> <li>• Government training and job creation policies are making their way into P3 project requirements, for example, "Apprentices on Public Projects" in British Columbia Policy and Procedures Guidelines<sup>16</sup>, Disadvantage Business Enterprise, Small Business Goals, On the Job Training Goals, Disadvantaged Business Enterprise (Minority/Women Owned Businesses), Emerging Small Business, Local Hiring Goals.</li> <li>• In British Columbia (BC), there are projects<sup>17</sup> that mandated First Nations (indigenous) participation, with penalties associated for not fulfilling the requirement.</li> <li>• The incoming BC government has announced a 'Community Benefits Agreement' initiative. It is unclear what the project requirement will be, however it is anticipated that two highway projects that are expected to be released in 2019 will incorporate the initiative.</li> <li>• Healthcare projects in or near large First Nation communities will specify unique requirements for maternity suites, food and other spaces to align with community customs.</li> </ul>
Flexibility	Ability of the asset to respond to changes in resource availability, population levels and demographics	<ul style="list-style-type: none"> <li>• P3 transportation projects will often have scope for capacity changes and allowances for additional infrastructure to be built as population (and corresponding demand) increases. For example, in the North Tarrant Express P3 project in Fort Worth, Texas which has a 52-year project term, there were provisions included for future capacity expansions of the asset as population and traffic in the region increases.</li> <li>• Market rates for variation work is often higher with the P3 contractor than if the owner was to tender for these services outside of the P3 agreement. Several projects have disputes over what constitutes appropriate costs<sup>18</sup>.</li> <li>• The Stanton Hospital Project includes a mechanism that allows the owner to adjust the scope/extent of service based on population projections that are sensitive to changes based on local mining activity.</li> </ul>
	Ability of the asset to respond flexibly to the introduction of disruptive technology	<ul style="list-style-type: none"> <li>• There are often mechanisms for the private sector to submit an innovation and value engineering proposal to the public sector. If an innovation proposal causes facilities management costs to decrease, the net savings are shared between the public and the private sector.</li> <li>• Many transportation assets will have scope to adjust to future technology upgrades which may become apparent and realised during the O&amp;M period, particularly on tolled highway projects, where both vehicle and tolling technology are continually changing, and the contract needs to be able to adapt over the term of the agreement.</li> <li>• To achieve performance outcomes, the traditional means and methods (or applicable standards) used to define how work is undertaken during the various development phases are sometimes not required to be fully adhered to by the P3 developer, allowing flexibility. In many U.S. state transportation P3 projects, this will mean the corresponding state-level Department of Transportation standards and specifications will be applicable to a lesser extent than they would be applied under a traditionally procured design-bid-build project that the state would normally procure. Instead, a shorter list of compulsory specification and standards will be developed. For example, on a recent U.S. highway bypass project in Ohio, only those specifications that raised a specific safety or operational concern were mandatory. <ul style="list-style-type: none"> <li>– limiting the required applicable standards to which the developer must adhere gives them increased flexibility and allows for innovation across all lifecycle phases by enabling them to avail of the full spectrum of their experience and knowledge with respect to global standards and specifications, which may be more effective and cheaper to implement. Giving more flexibility in the applicable standards allows the owner to focus on the performance outcomes and not be concerned <i>how</i> the outcomes are achieved but only that they <i>are</i> achieved and in a timely fashion.</li> </ul> </li> <li>• The potential for technology disruptions is also seeing vulnerable aspects of projects in this space excluded. For example: lifecycle replacement of audio-visual equipment is often excluded from Ontario AFP projects, on the basis that there is so much change in new technologies that it not easily compatible with the long contract duration.</li> </ul>

<sup>16</sup> <https://www2.gov.bc.ca/gov/content/industry/construction-industry/apprentices>

<sup>17</sup> Mott MacDonald is the Lender's Technical Advisor on the John Hart Generating Station Project that has a First Nations participation requirement. The private sector subsequently exceeded the First Nations participation requirements.

<sup>18</sup> [http://www.auditor.on.ca/en/content/annualreports/arreports/en17/v1\\_311en17.pdf](http://www.auditor.on.ca/en/content/annualreports/arreports/en17/v1_311en17.pdf)

### 3.3 Africa, Asia and the Middle East

In contrast to the former two regions, the regions of Africa, Asia and the Middle East are best described as emerging in the PPP space. Although very different in many respects, they do share some similarities, most notably that all consist of both developing and developed nations, meaning that these regions see a very clear and distinct mix of infrastructure and development priorities.

As emerging regions, there is largely an absence of standardisation within most aspects of the PPP model (for example, RFP response requirements, standard contracts, assessment frameworks or output specifications), and they rely heavily on the guidance of the World Bank, Public–Private Infrastructure Advisory Facility (PPIAF), International Finance Corporation (IFC) and numerous development banks, such as the Development Bank of Southern Africa (DBSA), the African Development Bank (AfDB), the Asian Development Bank (ADB) and the Asian Infrastructure Investment Bank (AIIB).<sup>19</sup> The involvement of these organisations often ensures that the output specifications typically follow World Bank procurement policies and procedures, IFC performance standards and equator principles, which generally align with the QI agenda.

However, given that infrastructure is lacking in many of these nations (basic services are often absent) and private sector participation is limited, the drivers behind development in these regions (and the resources available to them) are often very different to those of the more mature markets. In addition, these regions are often susceptible to (comparatively) poor planning and prioritisation processes, which also impact the development process.

The table below summarises some of the observations from the region with respect to the alignment of output specification to the QI focus areas.

**Table 3.3 Output specifications and alignment to QI – Africa, Asia and the Middle East**

	Quality Infrastructure Focus Area	Comment
Whole-of-life /Resilience	Sustainability and longevity of an infrastructure asset	<ul style="list-style-type: none"> <li>• Sustainability and longevity of an infrastructure asset depends on the following:               <ul style="list-style-type: none"> <li>– integration of sustainability principles in different phases of the PPP process cycle including screening, appraisal, structuring and drafting, tender and award, and managing the contract – during construction and operating phases;</li> <li>– suitability of design for the need during the entire design horizon, selection of the solution, material quality, adherence to specifications and standard regulations, workmanship, diligent operations and maintenance; and</li> <li>– sustainability is often addressed at minimum requirements set by relevant authorities without incentives for enhanced sustainability.</li> </ul> </li> <li>• Annuity paid on service availability with clear KPIs and associated performance deductions for non-adherence ensures that the asset will be built and managed properly throughout the concession period to optimise the lifecycle costs and increased asset life.</li> <li>• Periodical monitoring from an independent engineer during construction and operations phase, construction quality of critical assets, reviewing progress reports including KPI adherence reports, regular independent assessment of the assets' condition against lifecycle budget and performance-based payments mechanism, will ensure the private sector builds and maintains a sustainable and durable asset.</li> <li>• Output specifications include different requirements in the procurement documents to ensure sustainability and longevity.</li> <li>• Clear handback requirement process and mechanism, although majority of projects have not yet reached the end of the operating term.               <ul style="list-style-type: none"> <li>– handback requirements occasionally include short-term joint operation periods between the procuring authority and private concessionaire/operator towards the end of the concession period.</li> </ul> </li> <li>• Lack of awareness of the public procurement towards the full lifecycle cost and tendency towards separating EPC and FM contracts where focus remains on CAPEX more than OPEX.</li> </ul>
	Ability of the asset to withstand natural and other disasters	<ul style="list-style-type: none"> <li>• This risk is occasionally shared, given the ability of the private sector to bear the risk for uninsured risks will be limited, though some types of natural disaster should be insured.</li> <li>• The Middle East and African regions are particularly vulnerable to climate change, including extreme heat, water scarcity, flooding and droughts. National standards include protective</li> </ul>

<sup>19</sup> There are regional exceptions to this – East Africa is increasingly being a region providing quality guidance.

	Quality Infrastructure Focus Area	Comment
		<p>measures against frequent events, but these are often taken from standards developed for other regions rather than being region specific.</p> <ul style="list-style-type: none"> <li>• The inclusion of unbacked resilience-related items in contracts is often seen as unnecessarily increasing costs and is therefore unsupported by government agencies.</li> </ul>
Fit for purpose	Ability of the asset to meet the expectations of end-users	<ul style="list-style-type: none"> <li>• Limited guidance during the project development process means uninformed owners either do not understand the importance of developing KPIs that align with priorities, or there is a lack of guidance to show how this is done.</li> <li>• Focus on deliverability of outputs rather than quality of outputs and end-use satisfaction, lack of user experience feedback systems.</li> <li>• Lack of standardised requirements of performance and monitoring mechanisms: <ul style="list-style-type: none"> <li>– linking KPIs with regular payment milestones and appropriate performance deductions for non-adherence to the service requirements or KPIs will ensure that the asset provides the defined performance standards. <ul style="list-style-type: none"> <li>○ third-party monitoring by an independent engineer and evaluations and performance-linked payment mechanisms are the key factor that will drive the private sector to build and maintain the asset to meet the service requirements.</li> </ul> </li> <li>– stakeholder communication and consultation during the planning phase should be undertaken, to understand and manage end-user's expectations, defining service requirements in line with end-user expectations and associated KPIs;</li> <li>– outlining minimum functional requirements of the assets will ensure the assets will meet the expectations of the end-users.</li> <li>– the ability of government stakeholders to manage the project after construction is a major issue in developing countries.</li> </ul> </li> </ul>
Social and environmental	Social and environmental impacts	<ul style="list-style-type: none"> <li>• Social and environmental effects are assessed through Environmental and Social Impact Assessments during the planning phase, with relevant performance standards incorporated into project documents.</li> <li>• Performance deductions related to social and environmental impacts are often not stipulated, but some other mechanisms are used, such as adherence to IFC performance standards during construction and O&amp;M phases.</li> <li>• Regular reporting against these performance standards is often required, but implementation stages often lack measurement against projected socioeconomic and environmental impacts.</li> <li>• No incentives for enhanced performance observed.</li> </ul>
	Health and safety considerations during both the construction and operation of the asset	<ul style="list-style-type: none"> <li>• Health and safety management systems plans, and adherence to the plans by private partner during construction and O&amp;M phases, are requested in the selected PPP projects, and they are asked to adhere to relevant national guidelines. However, there are no specific or additional requirements for PPP projects.</li> <li>• Monitoring the health and safety related incidents is needed, with the requirements of the same often varying widely throughout the regions.</li> <li>• Ideally, there should be performance deductions for violation of minimum standards, but it is noted that no such requirements are stipulated in the procurement documents of the selected water PPP projects that were examined.</li> </ul>
	Social inclusiveness and job creation	<ul style="list-style-type: none"> <li>• Preparation stages often include socioeconomic studies as a requirement of project viability and this may include requirements around job creation. However, this is not often measured.</li> <li>• The requirement for the utilisation of a local workforce is the most commonly incorporated requirement in the regions. However, there is often a lack of human resources development strategy to meet the market and population needs.</li> <li>• To achieve social inclusiveness, the contract document ought to specify the services provided to the consumers regardless of their background. Selected projects have KPIs and associated performance deductions related to meeting the consumer needs, requests and resolving the complaints within the stipulated duration regardless of their background.</li> <li>• There are limited examples of social inclusiveness measures: South African's PPPs must comply with the country's Broad-Based Black Economic Empowerment Act (B-BBEE), which includes several social inclusiveness compliance requirements, such as preferential procurement with Small and Medium Enterprises (SMEs) or B-BBEE compliant suppliers. Contracts include indicators and milestones that should be achieved in different stages of the contract.</li> </ul>
Flexibility	Ability of the asset to respond to changes in resource availability, population levels and demographics	<ul style="list-style-type: none"> <li>• Population growth, demand and capacity details are highlighted in the output specifications of the selected projects.</li> <li>• Funding and fiscal liability approval for infrastructure projects requires alignment with goals and priorities of the national development strategy.</li> <li>• Project construction is phased in such a manner that it may align with future increases in population and development in the region.</li> </ul>

Quality Infrastructure Focus Area	Comment
Ability of the asset to respond flexibly to the introduction of disruptive technology	<ul style="list-style-type: none"> <li>• No clear specifications were stipulated to deal with resource availability, as this risk is attributed to the private partner.</li> <li>• Lack of RFP/contract requirements for targeted economic contribution.</li> <li>• Lack of post-implementation measurement and tracking of economic goals.</li> </ul> <hr/> <ul style="list-style-type: none"> <li>• Most of the technology-related risks are transferred to the private partner in designing the suitable solution for the project.</li> <li>• A degree of flexibility to adopt new technologies, especially in power and water output-based projects.</li> <li>• No clear guidance on adopting flexibility to the introduction of the disruptive technology.</li> <li>• Lack of standardised requirements for knowledge transfer.</li> <li>• Organisational resistance to new technologies threatening traditional public jobs and dominant suppliers.</li> </ul>

## 4 Methodology outline – phase two

Although a two-phase process, the priority for this Guidance Note is the preparation, during the second phase, of a Reference Guide, which will assist proponents and governments in the development of Quality Infrastructure and more sustainable assets.

Specifically, the Reference Guide will consider the output specifications, KPIs and other such assessments, reporting and contractual mechanisms of between 12 to 15 reference projects, to extract commonalities and lessons learned, which proponents and government stakeholders of PPP projects can utilise to further the QI agenda.

The exemplar projects will cover the main economic infrastructures sectors - energy, transport, water and sanitation; and social sector projects, such as schools and hospitals, and the following characteristics of these projects will be considered:

- Performance standards (availability and user-pays) used, together with how changes to the same are managed;
- The relationship between asset management and performance standards;
- The use and development of effective KPIs;
- The use of incentives such as payment deductions;
- Requirements around response and rectification times; and
- The provisions and use of termination triggers.

The Reference Guide will enable a user to assess whether the project is an example of a Quality Infrastructure project with reference to the following focus areas:

- Sustainability and longevity of an infrastructure asset;
- Ability of the asset to withstand natural and other disasters;
- Ability of the asset to meet the expectations of end-users;
- Social and environmental impacts;
- Health and safety considerations during both the construction and operation of the asset;
- Social inclusiveness and job creation;
- The ability of the asset to respond to changes in resource availability, population levels and demographics; and
- The ability of the asset to respond flexibly to the introduction of disruptive technology.

In developing the guide, a long list of 45 projects will be considered. This list will:

- Consist of projects across all asset classes;
- Consider projects in all geographic locations - both the developing and the developed world - including: Argentina\*, Australia\*<sup>20</sup>, Brazil\*, Bangladesh, Canada\*, China\*, Colombia, France\*, India\*, Japan\*, Netherlands, Peru, Saudi Arabia\*, Sri Lanka, Singapore, South Africa\*, Turkey\*, UK\* and the US\*;
- Include arrangements for both services and physical assets;
- Include projects at varying stages in the development cycle; and
- Include projects utilising varying types of PPP models.

This list will subsequently be refined to 12 -15 selected projects.

The information to be included in the Reference Guide will be collated via document review, interviews with the relevant project stakeholders and, where applicable, site inspections and visits. The Reference Guide will be freely available on the GI Hub website in the first half of 2019.

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<sup>20</sup> Denotes G20 nation.



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