

Managing risks in the public procurement of goods, services and infrastructure



OECD Public Governance Policy Papers

Managing risks in the public procurement of goods, services and infrastructure

This paper is published under the responsibility of the Secretary General of the OECD. The opinions expressed and the arguments employed herein do not necessarily reflect the official views of OECD member countries.

This paper was authorised for publication by Elsa Pilichowski, Director, Public Governance Directorate.

Representing approximately 12% of GDP across OECD countries, public procurement is an important pillar of public service delivery. However, successful public procurement is threatened by risks in areas as diverse as compliance, sustainability, and operations. Governments can address these challenges by identifying, assessing, treating, and monitoring risks throughout the procurement process. To do so, they use general tools such as risk registers and risk matrices, as well as more targeted measures aimed at specific challenges, such as supply chain risks. The procurement of complex goods, services and infrastructure involves different and often more consequential risks linked to market structures, the size and length of contracts, and the interconnected nature of decision making. In addressing this broad array of risks, the development of a national risk management strategy is a crucial step to ensure a co-ordinated and consistent approach.

This document, as well as any data and map included herein, are without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries and to the name of any territory, city or area.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

The use of this work, whether digital or print, is governed by the Terms and Conditions to be found at <https://www.oecd.org/termsandconditions/>

ISSN: 27079171

©OECD (2023)

Table of contents

Glossary	5
Executive Summary	7
1 Introduction	9
2 Why risk management matters for public procurement	11
2.1. Applying risk management throughout the procurement cycle and for different levels of complexity	11
2.2. Applying risk and risk management concepts to public procurement	12
2.3. Public procurement is subject to different categories of risks	15
3 Applying the risk management process to public procurement	17
3.1. Preliminary steps and prerequisites for successful implementation	17
3.2. Risk identification	19
3.3. Risk assessment	23
3.4. Risk evaluation and treatment	25
3.5. Risk monitoring	28
3.6. Communicating risk	29
3.7. The role of supply chain risks in public procurement	29
4 A scalable framework for risk management	34
4.1. The procurement of common (non-complex) off-the-shelf goods and services is subject to risk through the procurement cycle	34
4.2. The procurement of complex goods, services and infrastructure introduces new and more severe risks	38
5 Developing a comprehensive public procurement risk management strategy	44
5.1. Creating a governance framework	46
5.2. Defining the context, objectives and scope of the risk management strategy	47
5.3. Setting a timeline for the implementation of the strategy	48
5.4. Identifying potential impacts	48
5.5. Identifying implementation measures	48
5.6. Monitoring the risk management strategy	49

6 Conclusion	50
Annex A. Examples of Procurement Risk Control Measures	51
References	54

FIGURES

Figure 2.1. Conceptualising risk	13
Figure 2.2. The risk management cycle	14
Figure 2.3. Mitigation of inherent risk to residual risk	14
Figure 2.4. Examples of categorisation of risks impacting public procurement outcomes	16
Figure 3.1. Example of a risk heat map or matrix	25
Figure 3.2. Risk treatment decision chart	27
Figure 5.1. Existence of a strategy for assessment, prevention and mitigation of public procurement risks, 2018	45
Figure 5.2. Process for the development of a risk management strategy	45
Figure 5.3. Number of countries with tools in place to assess public procurement risks, 2018	49

TABLES

Table 3.1. Example of potential data sources for public procurement risk identification	22
Table 3.2. Example procurement gateways	28
Table 3.3. Examples of actions to manage supply chain risks	32
Table 4.1 Overview of key procurement cycle risks for common goods and services	34
Table 4.2. Overview of key procurement cycle risks for complex goods, services and infrastructure	39
Table 5.1. Clearly defining roles and responsibilities	46

BOXES

Box 1.1. Principle “Risk Management” of the OECD Recommendation on Public Procurement	9
Box 3.1. Preliminary steps to applying the risk management process within an organisation	19
Box 3.2. Identifying gender-specific supply chain risks	20
Box 3.3. Using Artificial Intelligence (AI) to identify procurement integrity risks in Brazil	21
Box 3.4. A transition risk management tool for innovation procurement	24
Box 3.5. Deciding when to transfer risk	26
Box 3.6. Addressing human right violation risk in medical glove supply chains through public procurement	31
Box 3.7. Global supply chains at work: trade in vaccines, face masks and tests during COVID-19	33
Box 4.1. The nature of the contractual relationship	37
Box 4.2. Three key infrastructure procurement failures	41
Box 4.3. The Support Tool for Effective Procurement Strategies (STEPS)	42

Glossary

Impact assessment: An impact assessment is an analytical process that systematically examines the possible environmental, socio-economic consequences of the implementation of projects, programmes and policies.

Internal control: Based on the definition used by the Committee of Sponsoring Organizations of the Treadway Commission (COSO), the International Auditing and Assurance Standards Board defines internal control as, “the process designed, implemented, and maintained by those charged with governance, management, and other personnel to provide reasonable assurance about the achievement of an entity’s objectives with regard to reliability of financial reporting, effectiveness and efficiency of operations, and compliance with applicable laws and regulations.”

Likelihood: Chance of something happening. In risk management terminology, the word “likelihood” is used to refer to the chance of something happening, whether defined, measured or determined objectively or subjectively, qualitatively or quantitatively, and described using general terms or mathematically

Risk: The probability of adverse or beneficial events, following a known probability distribution. The International Organization for Standardization (ISO) defines risk as the effect of uncertainty on objectives.

Risk appetite: Amount and type of risk that an organisation is willing to pursue or retain (also known as risk tolerance).

Risk control: Process to modify risk. Risk controls can involve avoiding the risk; accepting or retaining the risk; changing the likelihood or consequences; or sharing the risk with another party or parties. Risk controls are sometimes referred to as risk mitigation, risk elimination, risk prevention or risk reduction.

Risk identification: The process of finding, recognizing and describing risks. Risk identification involves the identification of risk sources, events, their causes and their potential consequences.

Risk management: Risk management refers to an integrated part of an entity’s management system, effected by an entity’s board of directors, management, and other personnel, applied in strategy setting and across the enterprise, designed to (a) identify, understand, and assess potential risks and opportunities (and their interdependence) that may affect the entity, and (b) manage those risks and opportunities to be within its risk appetite, so as to provide proper disclosure and reasonable assurance regarding the achievement of entity objectives.

Risk management also relates to generating ideas and promoting good practice, and is most effective when line managers (a) embrace it and use it as part of their management process, and (b) provide their employees with a better understanding of the entity’s risk appetite, to help manage risk across the organization.

Risk management framework: Set of components that provide the foundations and organizational arrangements for designing, implementing, monitoring, reviewing and continually improving risk management throughout the organization.

Risk management policy: Statement of the overall intentions and direction of an organization related to risk management.

Risk management plan: Scheme within the risk management framework specifying the approach, the management components and resources to be applied to the management of risk.

Risk management process: Systematic application of management policies, procedures and practices to the activities of communicating, consulting, establishing the context, and identifying, analysing, evaluating, treating, monitoring and reviewing risk.

Risk owner: Person or entity with the accountability and authority to manage a risk.

Severity: Outcome of an event affecting objectives, or the impact of a risk materialising. Consequences can be expressed qualitatively or quantitatively. Also referred to as consequence.

Source: (International Organization for Standardization, 2009^[1]; OECD, n.d.^[2])

Executive Summary

Representing approximately 12% of GDP across OECD countries, public procurement is a key pillar of public service delivery; however, risks affecting public procurement can have significant consequences on the quality and quantity of public services governments can provide. These risks are wide ranging, including both risks to the procurement process itself as well as broader risks to project or service delivery. In recent years, countries have widened their focus from integrity-related threats to other risks to public procurement outcomes, including information technology, financial, reputational, social, and environmental risks. For example, supply chain risks are an increasingly prominent concern for public buyers. While supply chain globalisation and specialisation has generated productivity gains and lowered production prices, it has also increased public buyers' exposure to supply chain risks such as extreme weather events, cyberattacks and supplier disruptions, as experienced by many governments during the COVID-19 pandemic. By considering the full range of potential risks in public procurement and developing strategies and tools to address them, governments can help ensure high quality service delivery and safeguard the public interest.

To address public procurement risks, public buyers should take a structured and systematic approach, beginning with the application of the risk management cycle to public procurement. The main steps of the risk management cycle (identification, assessment, evaluation and treatment, and monitoring) are applicable to all phases of the procurement process. Risk management should be a continuous process, with the steps of the risk management cycle regularly revisited through the procurement process to adapt to new circumstances and unforeseen events. These four steps should be supported by activities and processes to communicate about risks and to promote a broader risk management culture. The specific actions taken for each step will differ depending on the phase of the process, the types of risk, and the goods, services or infrastructure being procured, but can include the use of general tools such as risk registers and risk matrices, as well as more targeted decisions about risk acceptance, transfer, control and avoidance.

Given the heterogeneous nature of the goods, services and infrastructure that governments procure, the risks and appropriate strategies for managing those risks vary significantly. This heterogeneity can be addressed by dividing goods, services and infrastructure into two broad categories:

- Common (non-complex) off-the-shelf goods and services for which a competitive market exists (e.g. vehicles, furniture).
- Complex goods, services and infrastructure that require customisation (not already available on the market). Examples of bespoke products include defence technology (e.g. a fighter jet with customised requirements), the procurement of innovation, and almost all infrastructure.

The procurement of complex goods, services and infrastructure faces different and often more consequential risks linked to more complex market structures, the size and length of contracts, and the interconnected nature of decision making. The procurement of custom or bespoke goods and services can often involve procuring goods or services with uncertain or undefined elements. These procurements inherently carry a greater degree of risk than the procurement of common and off-the-shelf items. Procurement strategies should consider the complexity of the goods, services and infrastructure being

procured and apply relevant risk analysis and considerations. The OECD's Support Tool for Effective Procurement Strategies (STEPS) addresses this challenge by informing these decisions in an evidence-based way.

Risk management is often carried out by public buyers without being formalised, communicated or documented, thus hampering informed and systematic decision making. A national strategy can help ensure the implementation of a coherent and streamlined risk management approach and strengthen the resilience and efficiency of the procurement system. Where a public procurement risk management strategy does not exist at the national level, entities should consider developing their own organisation-level strategies in line with international good practices. Developing an effective public procurement risk management strategy should include the following steps: creating a governance framework, defining the objectives and scope, setting an implementation timeline, identifying potential impacts and implementation measures, and putting in place a monitoring plan.

1 Introduction

Efficient and effective procurement is critical to the fulfilment of the basic functions of public administration and to ensuring sustainable and inclusive economic growth. Taking threats to that efficiency and effectiveness seriously requires a systematic consideration of risk and the implementation of well-developed risk management strategies. The *OECD Recommendation on Public Procurement* (see Box 1.1) advises that countries integrate strategies for the mapping, detection and mitigation of risk throughout the public procurement cycle (OECD, 2015^[3]) and the *Recommendation on the Governance of Infrastructure* advises countries to implement a risk-based approach across the whole procurement cycle. The *Recommendation on the Governance of Infrastructure* further states that a comprehensive plan for managing, monitoring and mitigating risks during the asset life cycle is an important component of ensuring value for money in infrastructure delivery (OECD, 2020^[4]).

A 2018 survey on the implementation of the *Recommendation on Public Procurement* found that only 52% of respondent countries had developed a strategy for the assessment, prevention, and mitigation of public procurement risks at the national level (OECD, 2019^[5]). Managing procurement risks serves to ensure value for money, service continuity and integrity. Beyond this, recent events have highlighted the strategic role of risk management in public procurement for supporting the resilience of governments, economies, and society as a whole.

Box 1.1. Principle “Risk Management” of the OECD Recommendation on Public Procurement

The Council recommends that Adherents integrate risk management strategies for mapping, detection and mitigation throughout the public procurement cycle.

To this end, Adherents should:

1. Develop risk assessment tools to identify and address threats to the proper function of the public procurement system. Where possible, tools should be developed to identify risks of all sorts – including potential mistakes in the performance of administrative tasks and deliberate transgressions – and bring them to the attention of relevant personnel, providing an intervention point where prevention or mitigation is possible.
2. Publicise risk management strategies, for instance, systems of red flags or whistle-blower programmes, and raise awareness and knowledge of the procurement workforce and other stakeholders about the risk management strategies, their implementation plans and measures set up to deal with the identified risks.

Source: Recommendation of the Council on Public Procurement (OECD, 2015^[3])

The critical role of public procurement was particularly evident through the response to COVID-19 as public services and infrastructure continued to operate and governments required urgent access to emergency response materials or so-called “essential goods” such as personal protective equipment, putting public

procurement at the front of governmental responses. Procurement and infrastructure delivery are playing a decisive role in strategies for the post-crisis recovery. Putting in place risk management practices, including infusing a risk management culture within public entities, will serve to address supply chain vulnerabilities revealed by the crisis (OECD, 2020^[6]).

This paper sets out an approach to risk management in public procurement that encourages governments to ensure high quality delivery and safeguard the public interest by considering the full range of potential risks in public procurement and developing strategies and tools to address them. By providing governments with a framework and practical tools to manage risk, it supports the efficient and effective delivery of goods, services, and infrastructure. The paper also responds to the request from the Public Governance Committee expressed in its 2021-22 Programme of Work and Budget for a risk management framework for public procurement, including supply chain risk management in cases of global crisis.

The next section briefly defines risk and risk management in the context of public procurement and the categories of risks that may impact procurement outcomes. The subsequent section lays out a step-by-step approach to applying risk management to public procurement activities, including relevant tools and actions. The fourth section develops a scalable typology of public procurement risks through the procurement process, examining both common (non-complex) goods and services as well as complex goods, services and infrastructure. Finally, the paper provides steps and considerations for the development of a comprehensive country-level risk management strategy for public procurement.

2 Why risk management matters for public procurement

Representing approximately 12% of GDP and 29% of public expenditure across OECD countries (OECD, 2021^[7]), public procurement is a key pillar for delivering public services and strategic government objectives. Risks impacting public procurement processes have concrete and significant consequences on the quality, quantity and timeliness of public services. This section defines the scope of the risk management approach and discusses the different categories of risks that impact procurement outcomes.

2.1. Applying risk management throughout the procurement cycle and for different levels of complexity

Risk management activities can be undertaken at different levels. It can address risks which threaten a system as a whole or a particular subsystem. This paper addresses risk primarily at the level of individual procurement procedures or at specific stages of the procurement process.

The paper addresses the delivery of the full range of publicly procured goods, services and infrastructure. Given the heterogeneous nature of these goods, services and infrastructure, the procurement risks and appropriate strategies for managing those risks vary significantly. This heterogeneity is addressed by dividing goods, services and infrastructure into two broad categories:

- Common (non-complex) off-the-shelf goods and services for which a competitive market exists (e.g. vehicles, furniture).
- Complex goods, services and infrastructure which require customisation (not already available on the market). Examples of bespoke products could include defence technology (e.g. a fighter jet with customised requirements), the procurement of innovation, as well as almost all infrastructure.

In practice, many procurement categories exist in between these two categories (e.g. both off-the-shelf and complex such as sophisticated medical equipment) and are subject to different levels of complexity and associated risks. For example, in some cases, the use of public procurement as a strategic policy lever to achieve policy goals related to environmental, economic and social challenges can be higher risk when it introduces additional complexity to procurement processes.

A major challenge to applying a risk management framework is clearly defining the scope in terms of project stages. In other words, where should the procurement function's role start and stop and the responsibility of other functions stop and start? The answer depends on the level of complexity of the project based on the two categories defined above.

The public procurement cycle commonly refers to the sequence of related activities from needs assessment, market analysis and engagement and option appraisal, through competition and award, to payment and contract management. This sequence is most relevant in the procurement of common (non-

complex) products and can be almost entirely led by the procurement function. As complexity increases, however, two adjustments become necessary:

- First, needs assessment and option appraisal become distinct inputs into the procurement cycle, carried out by specialised functions. In complex procurements, such as large infrastructure projects, a national master plan (strategic planning) represents the needs assessment, further supplemented with investment appraisal to identify the best solution.
- Second, greater complexity requires the consideration of dimensions which generally are implicit in the procurement of common (non-complex) goods. Once the needs assessment is complete, the make-or-buy decision determines which capabilities the procuring entity develops in-house and which it needs to procure. Next, decisions on the packaging¹ of the procurement into contracts follow. Lastly, decisions on the nature of the contract for each package need to be determined, which also drives the choice of the bidder evaluation and selection process. The contracts need to determine both the incentives and the nature of collaboration between the buyer and supplier (i.e. is it based on competition or collaboration).

Thus, when procuring complex products the needs assessment and option appraisal are no longer the responsibility of the procurement function. Failure in these stages, however, still represents a risk for the stages of the procurement process which remain the responsibility of the procurement function. For example, inadequate needs assessment for a metro project may result in an outcome that does not serve groups with impaired mobility (e.g. wheelchair users, parents with strollers). While this is a failure of the project, it is not in itself a procurement failure as the needs assessment in this case is a separate specialised function. However, stakeholder groups can exert pressure to address their needs in the functional specification², while the project is already under construction. Similarly, boring a tunnel through an urban environment with incomplete utility maps can frequently result in a need to find alternative solutions when the project is already under construction. These risks are not specifically related to procurement; however, knowing whether the scope of the project will be subject to frequent changes will affect the choice of the appropriate procurement strategy.

2.2. Applying risk and risk management concepts to public procurement

This paper uses the ISO 31000 definition of risk: an uncertain future condition or circumstance that could impact the achievement of objectives, and one that is often characterised by reference to potential events or consequences. Objectives can have different aspects (such as financial, health and safety, gender inequality, or environmental) and can apply at different levels (such as strategic or project levels) (International Organization for Standardization, 2018^[8]). Risks can therefore be conceptualised in terms of their component causes, events, and consequences (HM Treasury, 2020^[9]; OECD, 2020^[10]):

- Risk factors are characteristics of an organisation's environment, policies, procedures or activities that are associated with risk.
- A cause is a fact or occurrence which alone or in combination has the potential to create risk.

¹ "Packaging" or contract scoping concerns the decision whether a major project should be procured through one or several contracts. In off-the-shelf products, the consideration is simply the size of the contract and which firms are able to bid for it. In the case of bespoke products, the question is not only the size but also the boundaries between contracts (which project activities should be in which contract). These decisions influence both the competitive response as well as create or avoid issues during contract execution.

² There is a large body of work on the causes and cures of cost overruns in infrastructure (and other) projects. One gaining prominence involves (inadequate) value distribution during the project preparation phase (Gil and Fu, 2022^[65]), leading to stakeholder interference in the approval or the execution of the project.

- An event is an occurrence or change in circumstances. Events are usually thought of as something unexpected, but can also be something expected which does not happen.
- Consequences are the outcome of an event affecting objectives and can be certain or uncertain.

Figure 2.1. Conceptualising risk



Source: adapted from (OECD, HAICOP, 2020^[11])

In the context of this paper, a risk is an uncertain future condition or circumstance related to public procurement: the possibility that an event, threat, missed opportunity, action or inaction will materialise and may impact the procurement objectives of a public entity (OECD, HAICOP, 2020^[11]). Risk management, therefore, is the identification, assessment, control or mitigation and ongoing monitoring of these uncertain future conditions or circumstances, their causes, and their consequences.

The steps of the risk management cycle (see Figure 2.2) are generally applicable to all phases of the procurement process, from strategic planning and needs assessment through to contract management. These four steps are supported by activities and processes to communicate about risk and to promote a broader risk management culture. Risk management should be a continuous process, with the steps of the risk management cycle regularly revisited through the procurement process to adapt to new circumstances and unforeseen events. The specific actions taken for each step will differ depending on the phase of the process, the types of risks, and the goods, services or infrastructure being procured.

Figure 2.2. The risk management cycle



Critical to this conception of risk management is the difference between inherent, net and residual risk (OECD, HAICOP, 2020^[11]):

- Inherent risk is the level of untreated risk, or the risk before the application of any risk management activities or control measures to reduce its likelihood or severity.
- Net risk is the level of risk following the application of any existing control measures or actions.
- Residual risk is the level of remaining risk following the application of new control measures or actions that may be under consideration.

Distinguishing between inherent, net and residual risk allows for an appropriate assessment of risk on an ongoing basis, as well as an evaluation of the appropriateness and value of control measures (see Figure 2.3).

Figure 2.3. Mitigation of inherent risk to residual risk



Source: Adapted from (OECD, HAICOP, 2020^[11])

Risk management also has costs, particularly around control measures. The costs, both direct and indirect, of implementing risk controls must be carefully assessed to ensure they are proportional to and commensurate with the reduction in the likelihood and severity of the risks being mitigated. It is often

impossible to completely eliminate risk, and there will generally be an acceptable level of risk beyond which the costs of risk control outweigh the potential harms.

The level of risk an organisation is willing to accept in the pursuit of its objectives is also known as its risk appetite or risk tolerance. Risk appetite varies from organisation to organisation and depends on a variety of factors, including its mission, the requirements of its stakeholders, its experience in the field in question and its organisational maturity. It should be grounded in a framework that guarantees the sustainability of the organisation and its ability to meet its obligations (OECD, HAICOP, 2020^[11]).

2.3. Public procurement is subject to different categories of risks

The volume of purchases, the complexity of the processes, and the number of stakeholders make public procurement a high-risk activity (OECD, 2016^[12]). Infrastructure procurement is particularly complex, making successful risk management critical to effective delivery. When choosing how to deliver infrastructure, governments must balance political, sectoral, economic, and strategic aspects, stakeholders' costs and benefits, and ensure that projects deliver value for money (OECD, 2017^[13]). These overlapping and sometimes competing considerations heighten the need to implement strategies to identify, assess, track, and mitigate risk. In all OECD countries, public procurement laws and regulations are at least partially applicable to the procurement of public infrastructure, with 61% of member countries applying public procurement frameworks to all infrastructure projects (OECD, 2019^[14]).

Public procurement can be impacted by a wide range of risks that can affect the procurement process itself, as well as broader risks to projects or service delivery. Risks do not occur only during the tendering process, but over the life of the contract or the life of the procured asset. Initially focusing on integrity threats, in recent years countries have paid increasing attention to other risks to public procurement outcomes, including information technology (IT), financial, reputational, social and environmental risks. Many of these risks impact the fundamental purpose of procurement, ensuring that goods, services or works are delivered to the right place at the right time. It is key to identify the root cause of different risks without confusing them with the consequences of these risks. Figure 2.4 provides examples of public procurement risk categories; while not comprehensive, these categories provide an indication of the breadth of the risk management challenges in the public procurement process³.

³ Appropriate risk categories will differ depending on the organisational context. For example, the OECD's *Public Integrity Handbook* provides an alternative typology of strategic, operational, financial, compliance and reputational risks (OECD, 2020^[10]).

Figure 2.4. Examples of categorisation of risks impacting public procurement outcomes

Regulatory and Compliance	Sustainability	Operational	Economic and contextual
Compliance with public procurement regulatory framework Compliance with relevant regulatory frameworks Integrity risks (fraud, corruption, collusion, etc.)	Environmental risks (e.g. procured goods have negative environmental impacts) Social risks (e.g. human rights violations and labour rights abuses in supply chains) Resilience risks (e.g. inadequate specifications lead to infrastructure failures)	Digital risks (e.g. failure of e-procurement system) Capacity risks (e.g. lack of procurement staff with necessary technical skills) Supplier risks (e.g. disrupted supply chains)	Budgetary risks (e.g. insufficient funding allocation) Market risks (e.g. low number of bidders)

Source: Adapted from (OECD, HAICOP, 2020^[11])

Procurement is a widely used strategic tool which can contribute to the achievement of complementary policy objectives such as the protection of the environment, the enhancement of innovation and the development of SMEs. Of the countries surveyed through the 2020 OECD Survey on Leveraging Responsible Business Conduct, all 27 had a framework to support environmental objectives in public procurement, 70% had a framework for ensuring the respect of human rights obligations and 41% had a framework for gender considerations (OECD, 2021^[7]). However, as introducing additional policy considerations results in higher complexity and reduced clarity of intended objectives, using public procurement as a strategic policy tool has the potential to increase risk. When using public procurement as a strategic tool to achieve policy objectives, in addition to risks related to negative impacts on the planet and society, it is key to also highlight other adverse risks. These include impacts on the market and the capacity and the capability of the procurement workforce.

3 Applying the risk management process to public procurement

This section provides a summary of the main steps of the risk management process and the associated actions that public buyers can take. While risk management can be divided into many steps, this paper simplifies by dividing the process into four key stages. This section also highlights risk management tools and techniques that may be useful at each step in the process.

Risk management involves implementing processes, policies, practices, or other actions that can change i) the likelihood of risks by addressing their cause, or ii) reduce the severity of the possible consequences. This can include, for example, the segregation of duties across the procurement process, the implementation of training and awareness programmes, the development of procedures manuals, internal and external audits, and establishing red flag systems (OECD, 2016^[12]). The severity and likelihood of risks, and the importance of associated risk control activities, will differ depending on the procuring organisation and the complexity and value of the goods, services or infrastructure being procured. Risk management activities should be dynamic and adapted to the evolving nature of the project. For small value, routine procurements, risks may be minimal, but risk management for more complex and/or high value procurements can warrant considerable investment in time and effort. This principle is also generally reflected in legal, regulatory and operational procurement frameworks, where financial thresholds typically set more stringent requirements in areas such as publication and the use of adequate procedures.

The preparation of risk management plans should begin as part of overall procurement planning, but risk management activities should be revisited and updated throughout the stages of the procurement process (OECD, HAICOP, 2020^[11]). The risk management cycle is a continuous process, with analysis and decisions reviewed and revisited on a regular basis. This is particularly true for complex procurements with longer timeframes, where there should be a continuous risk identification and re-assessment process in place as the project matures.

3.1. Preliminary steps and prerequisites for successful implementation

Implementing a risk management approach within an organisation requires taking a number of steps summarised in Box 3.1. First, it requires defining an overall vision and strategic objectives and clearly identifying the challenges and benefits of a risk management approach (OECD, HAICOP, 2020^[11]). This can include aligning the risk management approach with broader strategic public procurement goals, such as improving efficiency and effectiveness, combatting corruption and fraud, and strategic policy goals such as environmental responsibility, gender equality and promoting innovation. It can also include determining the procurement system's risk appetite and specifying the roles of different stakeholders and ensuring effective coordination (OECD, 2016^[12]). It requires understanding the environment in which the public buyer operates and the organisation of the broader public procurement system (OECD, 2022^[15]).

The engagement, leadership and support of senior management is fundamental to the successful implementation of risk management processes and for the mobilisation of actors across the public

procurement system. This engagement can reinforce the importance of risk management both explicitly, through actions such as the creation of risk management organisational structures or the designation of a senior decision maker with responsibility for risk, and implicitly, for example by making risk a standing item in senior management meetings and emphasising its importance in learning and training programmes (OECD, HAICOP, 2020^[11]). By showing commitment to their role in risk oversight, senior management can help foster an effective risk management culture.

These preliminary steps also include establishing uniform and organisation-specific risk criteria. Four criteria are recommended: the likelihood of occurrence or the probability of occurrence of a risk, designated by (L), the severity of a risk, designated by (S), the risk criticality, designated by (C), and the efficiency of control measures (OECD, 2022^[15]). Note that it is recommended to establish scales with an even number of options: this can help to avoid the tendency for risk evaluators to select the middle value as a default.

Risk likelihood (or L) can be assessed based on different parameters, including the public entity's mission and the availability of historical data. It can be assessed by assigning a probability (e.g. 75% probability of occurring per year) or a frequency (e.g. more than 20 times). After defining the rating scale (e.g. 1 to 4) and assigning each rating a definition, specific risks can be given individual ratings. For instance, a rating of 4 could be defined to mean that the risk is very likely or that it has a probability greater than 80%. These parameters will depend on the context of each public buyer or each procurement: it is necessary to understand the environment in which the procurement is being carried out and in which the public buyer and its stakeholders operate (OECD, HAICOP, 2020^[11]).

The severity of a risk (S) provides an estimate of its consequences, which could include, among others, impacts on costs, time, quality or reputation. The severity is specific to each entity, as the same risk can result in consequences of varying severity from one public buyer to another, depending on its activities and role. After determining the rating scale (e.g. 1 to 4), each rating should be assigned a specific definition. A rating of 4 could be defined as a very severe risk, involving, for example, an increase in cost of greater than 50% (OECD, HAICOP, 2020^[11]). This can be more challenging than defining the likelihood scale, as it involves comparing risks along numerous dimensions, such as budgetary cost, reputational impact, or quality, on a single scale.

These two criteria enable public entities to measure the criticality of a risk, designated by (C) where $C = L \times S$. This measure allows for an evaluation of the relative importance of risks and can be a useful tool for prioritisation.

The final criterion is the effectiveness of control measures, a scale which allows for the systematic evaluation of efforts to reduce risk. It provides a standardised approach to evaluating a control's impact on criticality (C). After determining the rating scale (e.g. 1 to 4), the impact on criticality can be assigned to each rating. For example, an effectiveness rating of 4 could be defined as very effective, and reducing criticality by more than 75%, while an effectiveness rating of 1 could be defined as marginally, with an impact on criticality of less than 25% (OECD, HAICOP, 2020^[11]).

Setting an organisation's risk appetite is a key step in establishing an overall approach to risk and can help to guide officials in their decisions to accept, mitigate, avoid or transfer risks (OECD, 2020^[10]). Risk appetite should be developed in the context of an organisation's risk management capability and involve appropriate consultation with stakeholders. Risk appetite may also vary between different types of risk and change over time (The Institute of Risk Management, 2011^[16]). Risk appetite policies should be reviewed periodically and appropriate adjustments considered (OECD, 2021^[17]).

Beyond specific processes, approaches and tools, successful implementation requires embedding a risk management culture in the organisation. A well-resourced, professional procurement function bolstered by human resource policies that recruit public procurement experts based on a merit-based system and require strong integrity commitment from public procurement entities can play a key role in this respect (OECD, 2016^[12]).

Building a culture of risk management requires a participatory approach that brings together and empowers those involved throughout the procurement process. This includes ensuring risks are assigned to those best able to manage them and giving those assigned responsibility the authority needed to develop and implement risk management strategies. Organisations should seek to raise awareness and knowledge of risk management strategies among the procurement workforce and other stakeholders. All employees should understand the organisation's approach to risks and take responsibility for risk management (International Finance Corporation, 2015^[18]).

Box 3.1. Preliminary steps to applying the risk management process within an organisation

Implementing risk management requires establishing the appropriate structure through a series of preliminary steps. These preliminary steps include:

- Define overall objectives and strategic vision for the risk management of public procurement
- Establish uniform and specific risk criteria
- Establish the organisation's risk appetite in public procurement
- Establish a risk management culture, which can include:
 - Widespread understanding of risk and sufficient training for employees;
 - Appropriate authority of the risk management function;
 - Strong expertise and experience of the employees in the risk management function; and,
 - Adequate provision of real-time information on risks.

Source: (International Finance Corporation, 2015^[18]; OECD, HAICOP, 2020^[11]; OECD, 2016^[12])

3.2. Risk identification

The first step in the risk management process is the identification of risks that threaten the objectives of public procurement activities throughout the procurement cycle. The identification of risks should start as early as possible and be revisited on a regular basis (depending on the capacity and resources of the entity and the characteristics of the procurement). Risk identification should be undertaken through a range of methods, including analysis of historical data, surveys and questionnaires, interviews and focus groups, discussions with key stakeholders, research of relevant publications, and case studies (OECD, 2016^[12]), and can be supported by the development of standard checklists and templates. As discussed in Section 2.3, public procurement activities are subject to different categories of risks. Adverse impact on people (such as women) and on the planet are increasingly considered and require proper risk identification. Box 3.2 provides factors to consider in identifying gender-related supply chain risks.

In conducting risk identification, it can be useful to draw a distinction between risks whose causes and/or consequences are internal to the contracting authority or procurement system and risks whose causes and/or consequences are external to the contracting authority (Public Procurement of Innovation Platform Consortium, 2015^[19]). For example, risks associated with global commodity prices are outside the control of the procuring organisation, while risks associated with selecting an inappropriate procurement method are internal. It can also be important to distinguish between risk, where the probability of a risk event is known, and uncertainty, where the probability of the event is unknown. Generating probability information around uncertainty can be an important part of risk identification and assessment.

As a starting point, it can be helpful to consider two fundamental questions: (1) What could happen? (2) How and why could it happen? For instance, the European Commission's Public Procurement Guidance for Practitioners recommends using two methods to identify risks: first, conducting a critical analysis of

procurement plans, in particular procurement documents and technical specifications, while asking the question ‘what could go wrong?’, and second, gathering feedback and ‘lessons-learned’ from the implementation of previous similar contracts, including engagement with other contracting authorities (European Commission, 2018^[20]).

Box 3.2. Identifying gender-specific supply chain risks

Gender mainstreaming involves the integration of a gender perspective into the preparation, design, implementation, monitoring and evaluation of policies, regulatory measures and spending programmes. The OECD report *Integrating Responsible Business Conduct in Public Procurement* shows that 57% of countries had developed a strategic and/or a regulatory framework to pursue gender policies through public procurement.

Including gender considerations in procurement risk assessments can help identify the adverse social impacts, including risks to gender equality, throughout supply chains. A gender-based risk management approach can identify events or conditions that may prevent the planned public procurement from meeting gender-related objectives and allow for the implementation of appropriate control measures.

Assessing gender-related risks in value chains should begin with the identification and assessment of relevant risks associated with specific geographic regions, countries, sectors, or individual businesses. For example, some sectors have greater levels of gender inequality or certain products may include raw materials or ingredients sourced from regions with low labour standards. Following risk identification and assessment, measures to encourage suppliers’ respect for gender equality can be included in different stages of the procurement cycle to lower their likelihood and their severity.

Three specific actors should be considered when identifying gender-related risks:

1. **End users:** the recipients of the service or product supplied by a potential supplier. Risk management activities could assess whether or not a procurement operation responds to end-users’ needs, including women. In Belgium, the Institute for the Equality of Women and Men released a manual and checklist in 2018 on gender-sensitive public procurement, specifically addressing how to conduct a gender-based needs assessment.
2. **The supplier’s employees (tier one of the supply chain):** the people directly employed by the supplier, who the contracting authority would deal with on a day-to-day basis. Risk management activities could assess whether the supplier’s employees comply with gender-based requirements in the tender documentation and/or with national frameworks on gender equality. For example, Switzerland’s public procurement law requires equal pay for men and women as a prerequisite for participation. Government agencies are empowered to carry out random controls to ensure compliance and infractions can lead to contractual penalties or exclusion from the procurement market.
3. **Employees in the supply chain (lower tiers of the supply chain):** employees working for suppliers below the first tier. Risk management activities could assess potential supply chains’ risks related to the compliance with gender-based requirements in the tender documentation and/or with national frameworks on gender equality. In practice, even in countries where the strategic or regulatory framework addresses gender, they are infrequently mandatory for the full supply chain. In the OECD Survey on Leveraging Responsible Business Conduct through Public Procurement, only 7% of countries reported requiring the application of their frameworks on gender considerations to the whole supply chain.

Source: (OECD, 2021^[21]; OECD, 2022^[22])

This can be supplemented by the ‘5 Whys’ method to understand the underlying or root causes of risks. It consists of iteratively asking the question ‘why’ until the final controllable cause is uncovered, with the

number of iterations depending on the complexity of the risk. For example, a failure to carry out an appropriate needs analysis could be caused by the absence of an appropriate methodology, which can be the result of a lack of capacity in the buying organisation, and ultimately gaps in the training of procurement professions with responsibility for needs analysis. Implementing this method requires working with those directly involved, including appropriate stakeholders, and confining the analysis to addressable causes (OECD, HAICOP, 2020^[11]).

Red flag systems can also be established to indicate when risks should be further investigated or escalated to decision makers (see Box 3.3 for an example). Red flags can include complaints from bidders, the share of contracts below procurement thresholds, unusual bid patterns, repeated awards to the same contractor, multiple contract change orders, poor quality goods, works, or services, or contracts that are significantly higher or lower than estimated (OECD, 2016^[12]). Public procurement data and in particular data from e-procurement systems can be a useful source of information for identifying and tracking red flags (OECD, 2019^[23]).

Box 3.3. Using Artificial Intelligence (AI) to identify procurement integrity risks in Brazil

The high volume of procurement processes and bids can present challenges for monitoring integrity risks. In Brazil, an average of over 350 procurement notices are published daily and tenders may only be open for a few days or weeks making it difficult to conduct risk assessments before contracts are signed.

To address this challenge, Brazil's Federal Court of Accounts and the Office of the Comptroller General implemented the *Analisador de Licitações, Contratos e Editais* (ALICE, Contracts and Public Notices Analyser), a tool which uses AI to support the continuous auditing of public procurement processes. ALICE accesses the Federal Public Procurement Portal as well as the procurement portal used by the Banco do Brasil, state-owned enterprises and local government agencies. ALICE downloads the bid documents and data and carries out data matching and text analysis to detect misbehaviour and risks in the tendering documents, such as bid rigging, restrictions on competitiveness, over-invoicing on prices and missing information in the public notice.

To detect tender irregularities, ALICE also saves relevant information from the Federal Public Procurement Portal in a machine-readable format to cross-reference with other datasets. Using confidential data and bidders' Taxpayer Identification Number as a unique identifier, ALICE is able to cross-reference entities across databases and detect potential causes for ineligibility during the tendering phase.

The Federal Court of Accounts reports that ALICE has had a significant impact on the identification of public procurement integrity risks, with benefits of the analyses totalling more than EUR 35 million in 2020. In 2021, the system assessed 139,566 bids and sent 35,461 risk notices, while 646 notices were analysed by auditors who opened 70 audit engagements.

Source: (OECD, 2022^[24])

Finally, risk registers are a commonly used risk identification tool. They fulfil a number of functions, including developing and maintaining a shared understanding of risks between stakeholders, ensuring the tracking and assessment of risks, recording decisions of how risks will be treated, verifying that responsibilities for risks have been assigned to the most appropriate risk owner, and providing a holistic view of risks that can be evaluated against the entity's overall risk appetite and risk management thresholds. Using a risk register, each risk should be assigned to a single owner, clarifying accountability, while also identifying others associated with the risk and/or contributing to control measures. Risk registers

often require each risk owner to set out the treatment measures that have been put in place. To maintain their effectiveness, risk registers should be updated on a set frequency and regularly reviewed with senior decision makers (OECD, HAICOP, 2020^[11]).

Many risk identification and assessment methodologies are based on qualitative assessments, typically resulting in risk inventories and assessments that capture the impact and likelihood of risks as perceived by procurement and risk management professionals. While these approaches provide critical insights, they may not capture unforeseen risks or may be susceptible to biases and inaccuracies. Organisations can strengthen their risk management strategies by using data-based approaches to complement qualitative methodologies (OECD, 2019^[23]).

Data analysis can play an important role in effective risk management, with growing opportunities to incorporate the use of data throughout the risk management cycle. Given the diversity of procurement risks, a broad range of data sources can be useful for the development of risk management strategies and the identification and monitoring of risks (see Table 3.1). While public procurement organisations are digitalising an increasing proportion of their operations through the implementation and expansion of e-procurement systems, efforts to fully leverage data from these systems and other sources is often less advanced. With the increased collection and availability of data, countries and contracting authorities are better equipped to conduct insightful evaluations of public procurement risk, yet the systemic use of this data remains a challenge (OECD, 2019^[5]). Nevertheless, data-based approaches to risk management often require specialised skills and investments in infrastructure, software and training. Before investing in quantitative or data-driven approaches to identifying, assessing and monitoring risks, institutions can conduct cost-benefit analyses and consider opportunities to pilot new approaches and technologies (OECD, 2020^[10]). In this context, standards such as the Open Contracting Data Standard (OCDS), can help to ensure that the procurement data collected and published meet global best practices and are fit-for-purpose to meet the needs of a range of different users (Open Contracting Partnership, n.d.^[25]).

Table 3.1. Example of potential data sources for public procurement risk identification

Data source	Potential uses and risks addressed
E-procurement systems	E-procurement systems can play a critical role in facilitating data collection, management and analysis, particularly where they cover the full procurement cycle. Many of the data sources listed below are available through comprehensive e-procurement systems. E-procurement systems are a key source for a range of data critical to addressing public procurement risks, principally detailed data on public tender processes (e.g. procedure type, product codes, bidding period length, estimated value, award criteria) and contracts (e.g. bidder and supplier information, contract length, final contract value).
Supplier registers	Supplier registries collect information from firms who wish to participate in tendering processes. They generally require potential suppliers to attest to or provide documentation establishing their ability to contract with public buyers. According to the 2018 survey on the implementation of the <i>OECD Recommendation on Public Procurement</i>, 62 percent of respondents had supplier registries available in some or all of their e-procurement systems. Supplier registries often collect information which can be leveraged for risk management and compliance purposes. This can include, for example, requirements to declare and maintain information on beneficial ownership. In some cases, this identification and verification must be carried out by an authorised person (e.g. lawyer, auditor) rather than through self-declaration.
Contract performance databases and data from ex-post analysis on project costs and benefits	Contract performance databases contain information on suppliers' performance under previously awarded contracts. This can include performance evaluations from buyers and information on adherence to costs and timelines, as well as data on a range of administrative and legal outcomes, such as terminations for cause or default and subcontractor payment issues. These databases can provide useful inputs for identifying and assessing risks related to specific procurements and to categories of goods, services and works which may be particularly high risk.
Exclusion lists	Exclusion lists are centrally maintained lists of potential suppliers who are not permitted to tender for public procurement contracts. Suppliers are added to the list based on a number of factors, often including poor performance in public contracts, offences related to money laundering and corruption, non-payment of taxes or bankruptcy. Data from exclusion lists can be used together with information from supplier registries and other data sets to identify potentially high risk tenderers or patterns across industries and product categories.

Asset and interest declarations	Many countries have asset and interest declaration processes requiring public officials to document outside activities (e.g. employment), investments, assets, and gifts, benefits or relationships that could result in a conflict of interest. Databases of asset declarations and conflict of interest declarations can be used by contracting authorities to mitigate corruption and integrity risks by highlighting cases of misconduct, as well as used more broadly in conjunction with exclusion lists and supplier registries to identify high risk procurements or product categories.
Unit price databases	A unit price or cost database compiles cost data at the line item or unit level and provides a standard reference for developing cost estimates. Unit price databases can be used to support the development of accurate cost estimates, reducing the risk of tenders exceeding budgeted costs or errors in the options appraisal process. More generally, they can inform procurement strategy development, helping to reduce the risk of sub-optimal packaging and decisions on the nature of the contractual relationship. They can also be used in the evaluation process, helping to determine whether procurement processes have been successful in managing costs.
Administrative registries and databases	Administrative registries and databases can include tax records as well as data from criminal, civil and administrative proceedings (domestic and international). These data sources can be used to determine suppliers' tax compliance, as well as identify potentially high risk tenderers or patterns across industries and product categories.
Pollutant release and transfer registers (PRTRs)	A Pollutant Release and Transfer Register (PRTR) is a publicly accessible database or inventory of chemicals or pollutants released to air, water and soil and transferred off-site for treatment. They bring together information about which chemicals are being released, where, how much and by whom. All OECD countries have established active national PRTR databases (for further details see: https://prtr.unece.org/prtr-global-map). PRTRs may be useful in identifying potentially high-risk tenderers or patterns across industries and product categories.
Supplier data	Supplier data is a broad category of information which may be sourced from employee payroll systems, mandatory or voluntary self-assessment statements and declarations, compliance reports on sustainability and supply chain due diligence, and public filings and financial reporting. If accessible, this information may be used to evaluate and monitor supplier risks (e.g. financial and supply chain risks), as well as to verify information and declarations provided by suppliers.

Source: (OECD, 2022^[26]; Deloitte, 2020^[27]; OECD, 2022^[24]; ITF, 2018^[28]; OECD, 2019^[23]; OECD, 2014^[29])

3.3. Risk assessment

The second step of the risk management process is assessing risks by evaluating the likelihood and severity of the identified risks. The assessment process asks the following questions:

- What is the likelihood the risk will occur? Depending on the risk, this likelihood may be defined or measured qualitatively or quantitatively and expressed mathematically or descriptively.
- If the risk occurs, how severe will the consequences be? Similarly, the severity of the risk can be expressed qualitatively or quantitatively.
- How do existing control measures affect the likelihood and the severity of the risk?

These questions can be answered using internal knowledge and experience, external resources such as audit reports, or by consulting qualified and experienced outside experts. In determining both likelihood and severity, assessments should account for existing risk management measures and distinguish between inherent and net risk. Where possible, efforts should be made to quantify the likelihood and severity in order to facilitate prioritisation and inform decisions around risk control measures (OECD, HAICOP, 2020^[11]). Box 3.4 provides an example of a tool for systemically assessing the likelihood and severity of risks in innovation procurement.

Box 3.4. A transition risk management tool for innovation procurement

Risk aversion is a key barrier to the adoption of strategic procurement by contracting authorities. This is particularly true for innovation procurement, where the development and adoption of new technologies poses risks beyond the procurement procedure itself.

To encourage the use of strategic procurement in projects co-financed by the EU, DG REGIO financed pilot projects to offer practical support to contracting authorities in Member States for strategic procurement initiatives. For one of the pilots, the OECD developed a tool to assess opportunities and risks in the transition from pre-commercial procurement (PCP) to public procurement for innovation (PPI). The goal was to provide a structured approach to decision making on transitioning from an innovative solution produced by a PCP to large-scale implementation using a PPI process.

The tool applies a risk lens which allows for the assessment of areas (financial, technical, institutional, market) in which the PPI process and the actual adoption of an innovative solution require further preparation or risk control measures. At the same time, it highlights those areas in which an organisation can benefit from introducing innovation. Together, this analysis allows users of the tool to make informed “go/no-go” decisions based on their predetermined risk appetite and the anticipated benefits from the innovation.

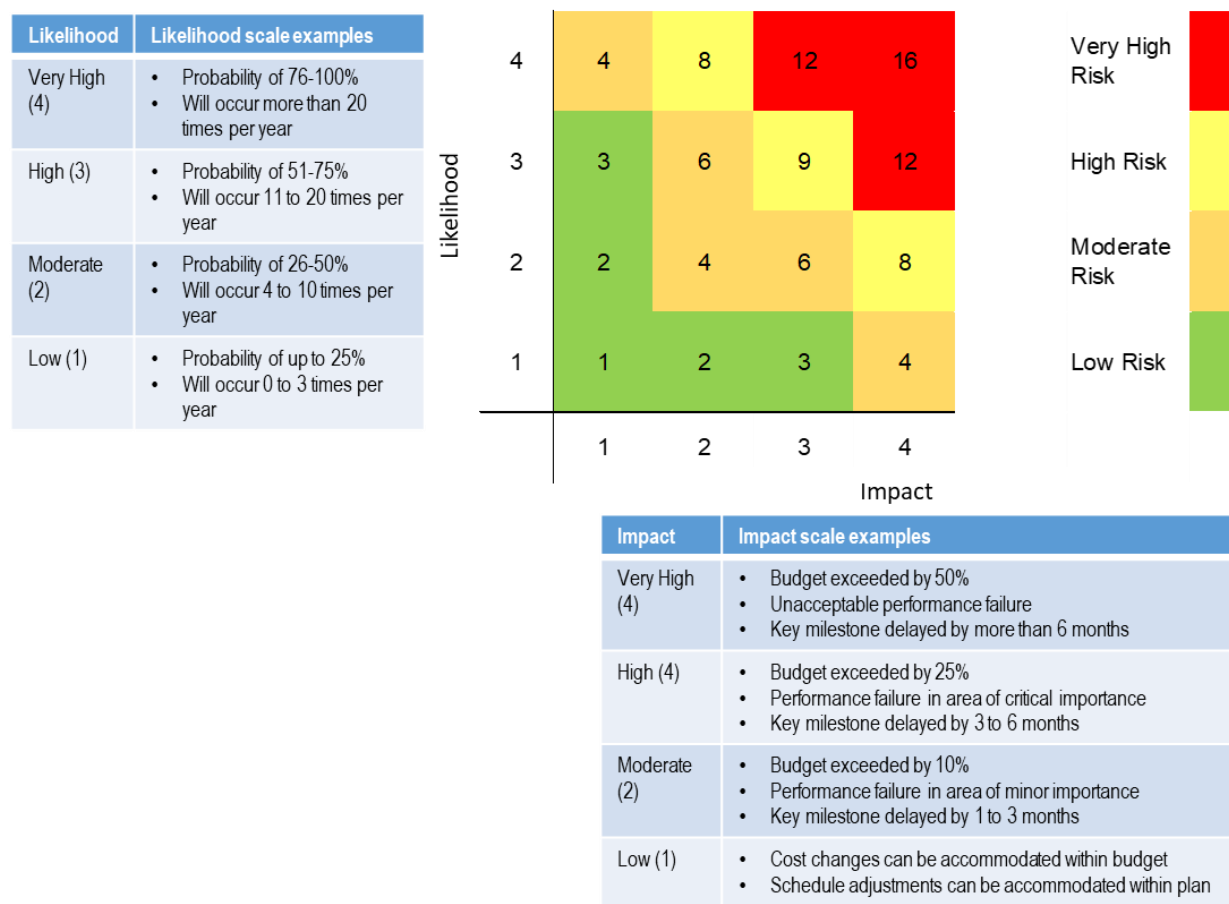
The tool is available at <https://www.oecd.org/gov/public-procurement/country-projects/public-procurement-and-cohesion-policy-objectives/>.

Source: (OECD, 2021^[30])

Together, the likelihood and the severity (L and S above) enable an overall risk estimate or criticality, designated as C above, and defined as the product of the likelihood and the severity ($C = L \times S$) (OECD, HAICOP, 2020^[11]). For example, if the likelihood is 4 and the severity is 3, then the overall criticality is $(4 \times 3) = 12$.

A risk matrix is a tool for classifying and visualising risks based on their likelihood and severity. It supports strategic and operational decision making by allowing for the measurement of the criticality of risks and providing a benchmark for comparison between risks and the evolution of risks over time. Risk matrices are dynamic tools that require regular review and updating after the evaluation of the efficiency and efficacy of risk management measures that are currently in place or under consideration (OECD, HAICOP, 2020^[11]).

Figure 3.1. Example of a risk heat map or matrix



Source: adapted from (OECD, HAICOP, 2020_[11])

3.4. Risk evaluation and treatment

Risk evaluation and treatment is the third main step in the risk management cycle. The appropriate treatment measures will depend on the results of the risk assessment, the public entity's risk appetite, and the cost of treatment options. The results of the risk assessment should be used to support decision making for the most appropriate treatment option for each risk depending on the risk appetite of the organisation in relation to its public procurement objectives. Effective risk management requires balancing the costs of different treatment strategies, the acceptability of residual risks, and the benefits of the action generating the risk.

Broadly, organisations face four options or paths for any risk (OECD, HAICOP, 2020_[11]):

1. Accepting the risk. This may be appropriate when the inherent or net risk is of suitably low likelihood or severity, when the cost of the expected outcome is relatively low, or when the cost of mitigating the risk is very high. Even when deciding to accept a risk, it may still be necessary to develop plans to monitor the risk and respond if it is realised. For example, when undertaking an innovation procurement, there is an essential risk that an appropriate or viable solution may not be developed (European Commission, 2021_[31]).

2. Transferring some or all of the risk to another party. For example, risk can be transferred through the purchase of insurance or the inclusion of indemnification clauses in contracts. Box 3.5 expands on the risk transfer decision for public buyers.
3. Mitigating or controlling the risk by reducing its likelihood and/or severity through a variety of treatments. For example, a public entity may mitigate the risk that specifications may not meet users' needs by putting in place formal processes to involve users in the development of technical specifications. Risk control involves devoting additional resources to reduce the criticality of risks, and public entities should ensure that they are efficiently allocating resources such that the costs of reducing a risk's likelihood and severity are balanced against the benefits. See Annex A for examples of public procurement risk control measures.
4. Avoiding the risk entirely by changing the procurement plan or abandoning the project. For example, a procurement might be cancelled if market analysis found that there were no or very few potential bidders who could meet the requirements.

Box 3.5. Deciding when to transfer risk

As part of their decisions around risk treatment, one option for public buyers is risk transfer. Through mechanisms such as contract clauses or insurance, public buyers can transfer financial responsibility for some or all of a risk and any costs associated with the materialisation of that risk.

However, buyers should ensure that they are achieving value for money and only transfer risk when the net cost is smaller than the cost of retaining the risk. Guidance often advises that risk should be allocated to the party best able to bear it, but buyers struggle to put this into practice. So, when should risk be transferred?

There are two dimensions at play when transferring risk:

First, the private party must price the risk it is accepting. The availability of information about the likelihood and severity of risk will strongly impact risk pricing. The less information there is available about the risk, the greater the uncertainty, the higher the contingency the private party will price in (up to a point, when it no longer wants to accept the risk), and the more inefficient risk pricing will be.

Second, if the private party can manage the risk better than the buyer, it can reduce its severity or likelihood and an efficiency gain exists.

For both dimensions, the level of competition between the private parties for the risk transfer is essential. However, the higher the uncertainty, the less effective competition will be.

Value for money for the public buyer will thus be achieved only if the efficiency gain is higher than the initial price of risk. There are therefore three key considerations: **the level of uncertainty, whether the risk is manageable, and the level of competition.**

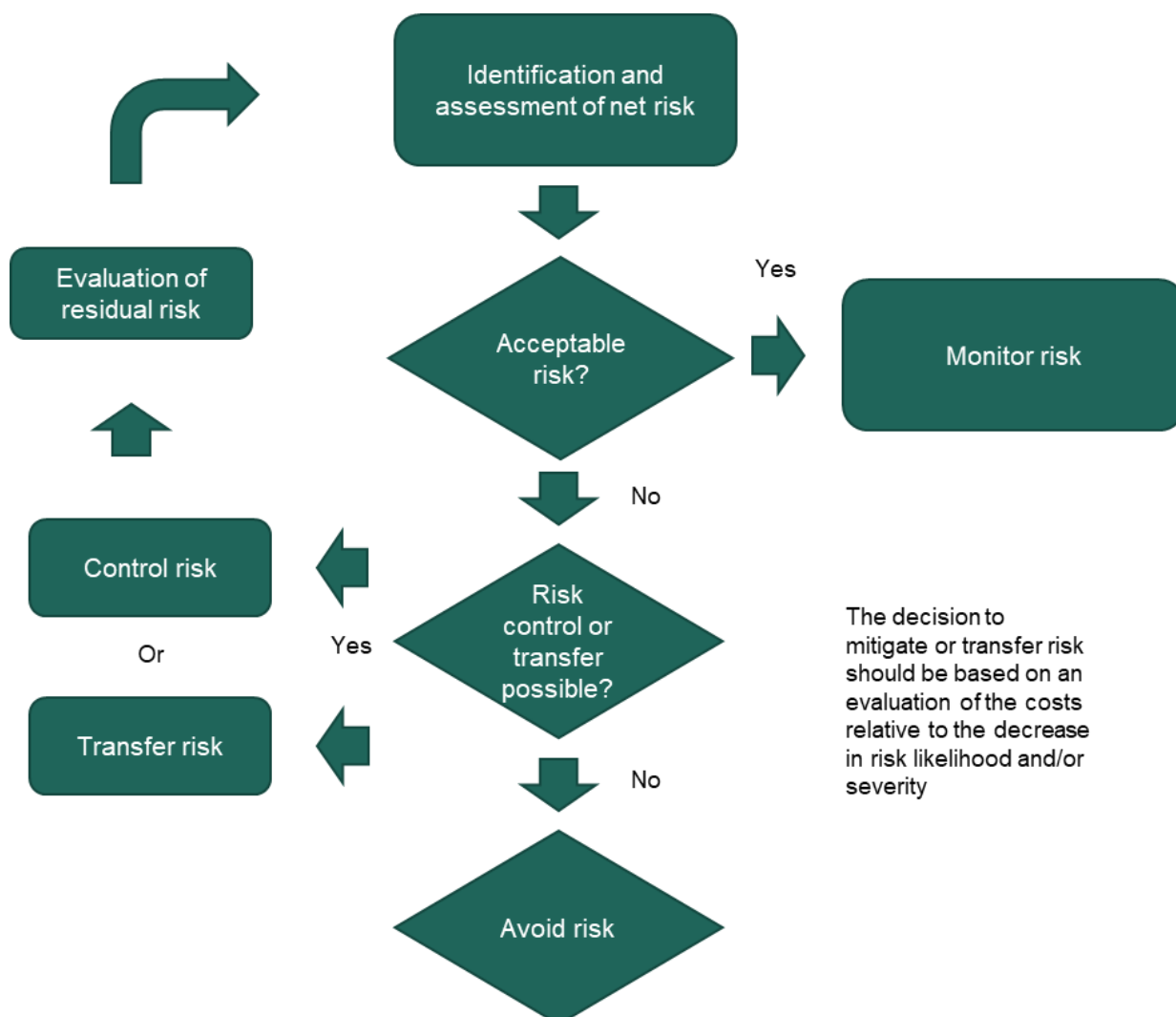
If the risk cannot be managed, there is no case for the risk transfer. The private party will not be able to reduce the severity or the probability of the risk and will thus only charge a premium based on the (imperfect) information it has about the risk. A classic example is the inflation of input prices of construction, as is currently the case due to supply chain disruption globally. As no one knows how the supply chain situation will evolve, the uncertainty is high. There may be private parties interested in offering insurance (contractors or financial intermediaries); however, as this is a risk they cannot manage, the public sector would only be buying price certainty for inputs, but at an inefficiently high risk premium. The public sector retaining the risk would thus be better value for money in this case.

Note: The precise reasons behind this logic above are related to fundamental questions in economics, which can be further pursued through the literature in the sources.

Source: (Makovsek and Moszoro, 2018^[32]), (ITF, 2018^[28])

Figure 3.2 provides a sample decision tree for this process, which can also be supported and informed by risk matrices, such as the example in Figure 3.1.

Figure 3.2. Risk treatment decision chart



Source: Adapted from (OECD, HAICOP, 2020^[11])

For higher risk, more complex or strategically important procurements, the European Commission's Public Procurement Guidance for Practitioners proposes establishing 'gateways' throughout the procurement process. Gateways aim to ensure that the procurement is well-planned and that all relevant parties are involved. The use of public procurement gateways was developed through lessons learned exercises on public contracts that had gone wrong, resulting in major cost or time overruns or failure to deliver expected results. These 'gateways' are key points in the development of a procurement where a review can take place before important decisions are taken (European Commission, 2018^[20]). Table 3.2 provides an example of potential gateways or key points in the development of a procurement at which risk reviews could be undertaken.

Table 3.2. Example procurement gateways

Gateways	Timing
Gateway 0: Completion of procurement planning	Takes place in the early planning to ensure that there are realistic, coherent and achievable milestones for the procurement and contract implementation
Gateway 1: Contract scope	Takes place on the basis of the draft procurement documents before any advertising or publication of information
Gateway 2: Shortlisting	Takes place following the evaluation of the selection criteria
Gateway 3: Tender evaluation	Takes place when the preferred tenderer has been selected, but before the contract award; or before proceeding to final tendering in the case of a two-stage procedure
Gateway 4: Contract	Takes place before the signature of the contract
Gateway 5: Interim and final deliveries	Takes place regularly during contract implementation at each stage of delivery

Source: (European Commission, 2018^[20])

Available treatment options will depend on the risks being managed. In all cases, interventions and control measures should be evaluated based on their impact in reducing risk relative to their costs. Note that to the residual risk should be evaluated against the net risk, rather than the inherent risk.

3.5. Risk monitoring

The final step in the risk management cycle is monitoring. Risk monitoring should take place throughout the procurement process and consist of ongoing tracking, as well as more structured reviews on a regularly scheduled basis. This key step aims at (OECD, HAICOP, 2020^[11]):

- Identifying new risks
- Tracking the criticality of risks within an evolving internal and external context
- Tracking the criticality of risks after the implementation of control measures, and helping prioritise any residual risk
- Providing assurance to internal and external stakeholders that risks are being monitored

Risk registers are a key tool to monitor individual risks and provide an overall view of the full suite of risks. Similar to the identification step, the use of appropriate data plays a key role to adequately monitor risks.

Data analysis can also play a key role in effective risk monitoring. The OECD *Recommendation on the Governance of Infrastructure* advises that adherents use digital technologies and data analytics to understand performance, inform decision making, and respond to identified risks and adapt control activities, while also acknowledging the need for systems that ensure systematic collection, storage and management of relevant data (OECD, 2020^[4]). Technologies such as AI systems can be used to cross-reference and reconcile terabytes of data from multiple sources to create alerts for non-compliance. By converting previously manual process, speed and effectiveness can be greatly increased (World Bank, 2020^[33]). For example, the Ukrainian ProZorro platform provides a data-driven monitoring system, developed with the European Bank for Reconstruction and Development (EBRD). It monitors corruption risk in real time, using an algorithm to scan all active electronic tenders for non-compliance and irregularities, following which risky transactions are selected for further monitoring. The system presents real-time results for the entire procurement system (Deloitte, 2020^[27]). Data can also support the implementation of portfolio risk management techniques which aggregate activity to provide a holistic view of risk that can be assessed and managed based on a range of criteria (OECD, 2021^[34]).

3.6. Communicating risk

Communication on risks is critical to successful risk management, and organisations should put in place processes to supply, share and obtain risk information in an iterative and continuous way. Communication should reflect stakeholders' expectations and needs, be carried out in a timely and regular fashion throughout the risk management process and ensure that relevant information is collected, consolidated and shared with multiple target audiences (OECD, HAICOP, 2020^[11]). The greatest procurement risks, particularly those that exceed the organisation's risk appetite, should be brought to the attention of relevant stakeholders.

There should be structured communication channels to ensure effective risk reporting within the organisation and, where necessary, with external stakeholders. Adequate risk communication should strive to be (International Finance Corporation, 2015^[18]):

- **Complete:** All required information should be included in risk communication to ensure that the audience is able to make decisions as soon as they get the information.
- **Concise:** The risk communication should only include relevant information. Communication should avoid unnecessary information that might confuse the audience or detract from the core message.
- **Accurate:** All risk communication should only include accurate facts to enable the audience to gauge the importance of the required actions.
- **Credible:** All communication should originate from people and/or institutions with sufficient influence and authority.

Risk management strategies, implementation plans and measures set up to deal with the identified risks need to be known and understood among the procurement workforce and relevant stakeholders in order to be effective. Staff should be encouraged to identify and report on existing and emerging risks through a clearly defined process.

Organisations can employ the following communication tools (International Finance Corporation, 2015^[18]):

- Charts and narratives linked to the organisation's risk appetite that show the current risk profile in relation to objectives.
- Dashboards of key risk indicators that provide a simple pictorial snapshot of major risks, the treatment actions, and the risk owners. Dashboards are useful when updated regularly and can be drawn from or linked to the organisation's risk register.
- Flowcharts and maps of processes with key controls to provide a pictorial representation.
- Internal and external stakeholders should be regularly updated on the risk profile through discussions, briefings and periodic bulletins.

3.7. The role of supply chain risks in public procurement

The provision of public services, including health, transport, and education, are crucial for the economy and economic recovery in the context of the COVID-19 pandemic. To provide public services, governments rely heavily on the procurement of goods, services and infrastructure (OECD, 2022^[22]). The provision of these goods and services relies on complex supply chains. With the Covid-19 pandemic, the concept of "essential goods" emerged in the international debate. While the definition of essential goods depends on the context, these can range from goods and services necessary to respond to an emergency or disaster (e.g. personal protective equipment, vaccines and medicines) to those goods and services that are necessary to maintain lives and basic wellbeing (e.g. utilities, core health services). International commitments, including from the G7, called for ensuring resilient global supply chains, notably through

increasing transparency on essential goods and on global standards, including on responsible business conduct (RBC) (OECD, 2022^[22]).

The sections below highlight the benefits of ensuring, on the one hand, supply chain resiliency and, on the other hand, the incorporation of RBC requirement throughout supply chains.

3.7.1. Addressing supply chain resiliency risks to deliver efficient public services

Production and supply chains have become increasingly globalised. One-third of international world production is done by multinational enterprises, accounting for half of world trade, and 70% of international trade involves exchanges of raw materials, parts and components, services and capital goods that are used by firms to produce and serve their customers (OECD, 2020^[35]). Globalisation has brought benefits in terms of higher productivity and living standards through channels such as lower prices resulting from stronger competition; greater scope for cost reduction from exploiting gains from specialisation and scale economies; and faster diffusion of technology through participation in global supply chains (OECD, 2021^[36]).

While this supply chain globalisation and specialisation has generated productivity gains and lowered production prices, it has also increased public buyers' exposure to supply chain risks such as extreme weather events, cyberattacks and supplier disruptions. Supply chain resilience refers to the ability of the supply chain to prepare for and adapt to unexpected events; to adjust to sudden disruptive changes; to continue functioning during a disruption; and to recover quickly to its pre-disruption state (Iakovou and White III, 2020^[37]; Kilpatrick and Barter, 2020^[38]). Supply chains with a low diversity of suppliers have an increased risk of disruption as a concentration of suppliers reduces buyers' ability to diversify away when facing disruptions. Suppliers can be concentrated such that a relatively small number of firms produce most of world supply or concentrated within a specific country or region. For example, the specialisation of production has led to a high level of concentration of production of critical components of many goods in a small number of countries, such as some forms of ICT equipment and semiconductors (OECD, 2021^[36]). This can threaten public buyers' primary procurement objective of delivering the goods and services necessary to accomplish government's mission (OECD, 2022^[39]).

As market failures can jeopardise the timely provision of essential goods and services in moments of crisis, international coordination and public policy action are critical to ensuring supply chain resilience. Fostering citizens' trust in governments' capacity to deliver essential goods and services during crises, trust between the public and private sectors to facilitate collaboration, and trust between governments to ensure international cooperation and avoid trade restrictions is essential to building resilience (OECD, Unpublished^[40]).

The COVID-19 pandemic exposed these structural vulnerabilities in global supply chains as disruptions in the supply of essential goods highlighted the risks associated with the international fragmentation of production (OECD, 2021^[41]). Contracting authorities competed for the same essential goods and services, facing high price volatility and an increased risk of purchasing fraudulent products. Public buyers realised they had limited insight into their supply chains and the associated risks, including supplier concentration. Implementing risk-based supply chain due diligence in public procurement processes can strengthen supply chain resilience, help buyers make well-informed decisions to prevent and mitigate risks, and enhance preparedness for future emergencies (OECD, 2022^[22]). Public buyers should learn from the pandemic to increase the resiliency of public supply chains without undermining the gains from the specialisation and economies of the scale facilitated by supply chain globalisation. This can include proactive risk management strategies, such as supply chain mapping and supplier segmentation. For example, essential goods that are being purchased from a single supplier are particularly vulnerable. Identifying additional suppliers and exploring other options for products at risk, such as repurposing local manufacture and repair, can counterbalance the risks of supply chain disruptions (OECD, 2020^[6]).

3.7.2. Responsible business conduct risks throughout supply chains

Public procurement stakeholders have become increasingly aware of social and environmental risks in global supply chains, especially risks related to child labour, forced labour or modern slavery and human trafficking. While public procurement can make a positive contribution to economic, environmental, and social progress, if not used strategically, it can also be linked to adverse impacts on people, planet and society and associated reputational impacts for governments. This has resulted in growing calls for governments and business to take greater responsibility for their purchasing decisions and actions (OECD, 2022^[22]).

These risks are not limited to specific procurement categories. For instance, environmental and labour rights risks can occur in the information, communication and technology (ICT) industry (OECD, 2022^[22]).

Unlike global shocks, risks related to business conduct, such as the violation of labour rights or human rights or some environmental risks, can be anticipated. Public buyers can identify, prevent, mitigate and address risks to their purchasing decisions to ensure the continuity of public services (OECD, 2022^[22]). In addition, risks of “non-compliance” with RBC frameworks might also impact procurement processes and thus the delivery of public services. This calls government to identify and mitigate those risks. This cannot be done without the cooperation of suppliers who have to undertake a thorough due diligence of their supply chains. The *OECD Guidelines for Multinational Enterprises* also recommend that businesses identify these risks, and then seek to mitigate and prevent them (OECD, 2011^[42]).

Box 3.6. Addressing human right violation risk in medical glove supply chains through public procurement

The manufacture of medical gloves is a global industry, producing approximately 150 billion pairs of gloves per year, with a market value of over USD \$5 billion. Most production occurs in Malaysia and Thailand, and on a smaller scale in other Asian countries. The leading regions for export are the United States, the European Union and Japan. Investigations by non-governmental organisations and media reports have identified serious concerns that the manufacturing of medical gloves presents a high risk of labour rights violations, particularly regarding the exploitation of migrant workers.

In recent years, several European procurement organisations, including the National Health Service (NHS) Supply Chain in the United Kingdom, Swedish regions, and the Norwegian national procurement agency, have developed policies to protect workers in the healthcare goods supply chain.

Given the concerns identified, the UK, Sweden and Norway decided to join force to increase their bargaining power with glove companies. Indeed, together they constitute a significant customer for the glove manufacturing companies. Therefore, discussions took place between senior management of the companies and the public buyers as well as different key civil society organisations: the British Medical Association, the Medical Fair and Ethical Trade Group and members of the European Working Group on Ethical Public Procurement. Several corrective measures have been put in place by suppliers for the harms identified, including payment of the minimum wage as per national regulations, the intention to address housing conditions of workers, the return of passports to employees, the repayment of recruitment fees to workers, as well as programs to support gender equality.

Source: (OECD, 2022^[22]; British Medical Association, 2016^[43])

3.7.3. Public buyers can promote supply chain resiliency and RBC standards

Governments and contracting authorities can adopt a range of strategies for managing supply chain resiliency and RBC risks (see Table 3.3 for examples). Governments can begin to address supply chain vulnerabilities by developing intelligence through horizon scanning, risk anticipation and scenario planning

to identify and mitigate potential weaknesses in global supply chains and sharing this information amongst public buyers and between public buyers and other stakeholders such as trade and regulatory authorities. This can be facilitated through improved data analytics to track the demand, availability and stock of certain essential goods and inputs (OECD, 2021^[36]).

The assessment of the potential impact of shocks on demand for and availability of essential goods in turn can inform risk management policies. These policies can range from improving cross-border co-operation (e.g. agreements to share essential goods, to conduct joint procurements or to avoid export restrictions), to diversifying suppliers, and working with the private sector to identify possible bottlenecks in supply chains and encouraging a certain margin of spare productive or supply capacity (redundancy) (OECD, 2021^[36]).

Table 3.3. Examples of actions to manage supply chain risks

Developing risk management strategies that address supply chain vulnerabilities	• Monitoring for rapid detection and response and increasing supply chain visibility. • Emphasising risk awareness and the development of a stronger understanding of supply chains can help contracting authorities adapt their sourcing strategies depending on the level of acceptable risk (e.g. identifying substitute goods). • Establishing stronger relationships with suppliers can help to ensure that lines of communication exist when risks materialise and ensure better information flow regarding changing circumstances.
Sharing risk management information	• Sharing data and information on the availability of essential goods, prices, and contacts to inform procurement strategies. Given the global nature of supply chains and supply chain threats, information sharing can be useful on national and international levels.
International procurement cooperation	• Help to smooth temporary disruptions in the flow of critical goods and services: ○ Implementing standardised procurement procedures, joint procurement agreements, and lending agreements to simplify cross-border transactions, facilitate the sharing of goods and inputs, and improve buying power. ○ Implementing international agreements to share essential goods, to conduct joint procurements at a bilateral or regional level or to avoid export restrictions to reduce disruptions.
Developing redundancies	• Developing redundancies by and diversified sourcing and building stockpiles (when relevant). ○ Determining the scope of products appropriate for stockpiling and managing stocks. There can be significant costs and inefficiencies associated with building, maintaining and managing stockpiles and governments should carefully consider the trade-offs, including in the choice of products to stockpile. ○ One strategy that governments have considered is ensuring suppliers are able to provide surge capacity where there are disruptions of supply.
Working to identify and alleviate potential bottlenecks in supply chains.	• Investing to improve physical logistics infrastructure such as ports, roads and rail networks. • Implementing more flexible transport, logistics and border process regulations to enable resiliency in response to disruptions. • Standardising and simplifying technical requirements to facilitate easier substitution between suppliers.

Source: (OECD, 2020^[6]), (OECD, 2021^[41]), (OECD, n.d.^[44]), (Iakovou and White III, 2020^[37]), (OECD, 2021^[36]), (OECD, 2020^[45])

Governments can also consider on-shoring production of critical goods and services, but should weigh the costs and benefits of this approach. Global supply chains have shown a high degree of robustness in response to COVID-19 (OECD, 2021^[36]; OECD, 2021^[41]) and on- or near-shoring is not necessarily an

obvious solution. Domestic suppliers can also be disrupted, and on-shoring the full supply chain may not be possible or practical. That said, there may still be strategic reasons to on- or near-shore production of some critical goods. For example, there are national and economic-security implications from the corporate and geographic concentration of the critical semiconductor industry in East Asia (predominantly Chinese Taipei). Even though there are advantages to regional concentration and clustering, having so much of a critical sector in the hands of so few regionally concentrated players could result in supply bottlenecks for reasons ranging from natural disasters to politically motivated restrictions (OECD, 2021^[36]). Some countries have argued for assessing supply chain vulnerabilities through a lens of shared values and trusted partnerships (e.g. ‘friend-shoring’) (Yellen, 2022^[46]). While this is a broader debate that extends beyond procurement processes, it shows how the broader geopolitical environment has an impact on procurement risks and how additional strategic criteria such as energy or data sovereignty can have a bearing on procurement decisions. To the extent that governments implement measures to on-shore supply chains, these interventions should be transparent, targeted and take into account any associated costs, trade-offs and risks (OECD, 2020^[35]).

Most policy responses would benefit from close partnerships between government and the private sector. Efforts to strengthen the resilience of global value chains to respond to rapid surges or shifts in demand and supply should involve collaboration between the public and private sectors while respecting their different roles and maintaining high standards of responsible business conduct (OECD, Unpublished^[40]).

Box 3.7. Global supply chains at work: trade in vaccines, face masks and tests during COVID-19

A 2022 OECD report examined international trade in three key products during the COVID-19 pandemic: vaccines, face masks and tests. In all three cases, global supply chains and international trade helped to mitigate supply constraints and facilitated access to essential products.

COVID-19 vaccines: Trade played a critical role in the ramping up of vaccine production, with a significant growth in trade in vaccines underpinned by rising exports and imports in the materials needed to produce them. For example, global exports of consumable materials used to manufacture vaccines, such as cell culture media and filters, increased by more than 66% between the start of clinical trials in Q1 2020 to the launch of widespread vaccination campaigns in Q1 2021.

Face masks: Trade and global supply chains helped to mitigate temporary supply constraints for masks early in the pandemic. The data suggests a large temporary increase in face mask imports to meet unprecedented demand in the early stages of the pandemic. Over three months, face mask imports to the United States increased by 15 times in value and volume, with similar increases in Canada, the EU and Japan. This surge in imports came mainly from China; however, face mask imports declined quickly and sources of imports diversified.

COVID-19 tests: Trade enabled the mitigation of temporary supply constraints and more sustained access to key test inputs and components such as laboratory reagents, nasal swabs and viral transport media. Exports of laboratory reagents from some of the previously top exporters (e.g. the United States, the Netherlands) increased by between 33% and 77%, while new suppliers such as Korea and China saw an increase in reagent exports of more than 10 times.

The relatively high degree of robustness and flexibility of global supply chains in response to COVID-19 pressures suggests governments should consider measures aimed at boosting resilience, along with any attempts to significantly on-shore production.

Source: (OECD, 2022^[39])

4 A scalable framework for risk management

This section develops a typology of public procurement risks through the procurement process at the project level. The first sub-section examines risks at each stage of the procurement cycle for common (non-complex) goods and services, which generally includes off-the-shelf goods and services which are already widely available on the market. The second sub-section examines more complex procurements, particularly of custom or bespoke goods, services and infrastructure.

4.1. The procurement of common (non-complex) off-the-shelf goods and services is subject to risk through the procurement cycle

Table 4.1 provides an overview of the procurement cycle for common off-the-shelf goods and services, along with the key risk at each stage. These key risks may have a range of root causes, and additional analysis may be required to determine those causes. For example, failing to adequately identify or understand needs is a key risk in the needs analysis stage of the procurement process, but may be caused by factors such as short timelines or lack of capacity on the part of procurement officials.

In the case of common (non-complex) goods and services all the phases addressed below will typically be the responsibility and under the control of the procurement function. The same is not the case for the procurement of complex off-the shelf goods and bespoke goods and services, which will be treated further below.

Table 4.1 Overview of key procurement cycle risks for common goods and services

Phase	Stage	Key risk
Pre-tendering phase	1. Needs analysis: Identification of needs, including engagement with stakeholders	Needs are not adequately or comprehensively identified or understood
	2. Market analysis and engagement: Assessing the market's ability to respond to the procurement and preparing the market to respond	The procurement strategy is badly informed and the market is unprepared to respond
	3. Drafting technical specifications (option appraisal): Analysis and selection of potential solutions	The wrong solution is selected or it does not fully addresses the identified needs
	4. Make-or-buy decision: Choosing which aspects of the delivery to manage or produce within the procuring organisation and which to buy	Capabilities are incorrectly assessed and responsibilities inefficiently distributed

	5. Packaging decision (contract scoping): Deciding to group the procurement into multiple lots	Lots are created in a way that reduces competition or introduces inefficiencies
	6. Contractual relationship (contract design): Choosing how to structure the contractual relationship between the buyer and supplier(s)	Risks are inefficiently allocated or incentive structure is misaligned
	7. Bidder selection process choice: Choosing a procurement process available in the procurement legislation	Risk that the most efficient bidder will not be selected
Tendering phase	8. Request for proposal/bid and tender submission: The process of issuing a request for tenders and receiving bids from potential suppliers	Lack of transparency, unequal treatment and competition failure
	9. Bid evaluation and award: The process of evaluating and selecting tenderers	The best value tender is not selected
Post-tendering phase	10. Contract management	The contract is not implemented as written (e.g. the supplier charges for goods and services not delivered)

4.1.1. Risks in the pre-tendering phase for common off-the-shelf goods and services

Inadequate attention to risk in the pre-tendering phase can have impacts throughout the procurement process. The pre-tendering phase is a critical opportunity to address risks before they have significant downstream impacts (European Commission, 2018^[20]). Negative outcomes such as a limited number of bidders or disputes over contract performance can often be traced to unaddressed issues in the pre-tender phase, while comprehensive planning can help to minimise risks and avoid errors. Inadequate and insufficient planning, by contrast, can lead to issues such as the use of non-competitive procedures in order to shorten timelines, while inadequate specifications can lead to costly contract amendments.

The pre-tendering phase can be divided into the following stages:

- **Needs analysis:** Needs analysis aims to define the nature and extent of the needs to be met through the procurement process. Incomplete needs assessment runs the risk of procuring the wrong goods and services, in the wrong amounts, at the wrong time, or not fully benefiting all intended recipients. An inaccurate needs assessment can be caused by incomplete consultations with the full range of current and potential users, poor demand forecasting (often due to inaccurate data), or a focus on the product being procured rather than the underlying need (OECD, 2022^[15]). This could include failure, for example, to incorporate a gender perspective into needs analysis, resulting in a failure to take gender differences into account and miss opportunities to address inequalities. In the example of a contract to support cycling or other mobility services, women and men may have different patterns of commuting, which influence their needs (OECD, 2021^[21]; European Institute for Gender Equality, n.d.^[47]).
- **Market analysis and engagement:** Market analysis involves identifying the main players in the market and the existing or upcoming solutions available, as well as preparing the market for upcoming procurements. Failing to conduct adequate market engagement can lead to inaccurate assessments of the market's capacity to deliver. Incomplete or inadequate market analysis can miss potential suppliers, particularly if information is not shared in an open and structured way. It can also lead to failed procurements if the capacity of the market is over-estimated or, conversely, the use of non-

competitive procedures without adequate justification if market capacity is underestimated (OECD, 2016^[12]; SIGMA Programme, 2016^[48]).

- **Drafting technical specifications (option appraisal):** Once the needs and solutions available on the market are identified, option appraisal is the process of analysing the costs and benefits of potential solutions. For common goods and services, it usually involves the identification of specifications or technical requirements that respond to the identified needs, as well as ensuring solutions are integrated with broader strategic priorities and budgeting. Risks can include the development of unnecessary pre-qualification requirements or specifications that are ambiguous, incomplete, or overly narrow, leading to reduced competition or higher prices from suppliers to compensate for unclear tender documents (OECD, 2022^[15]). For example, technological or vendor lock-in can be a particular risk in ICT procurement. Public organisations find themselves unintentionally “locked” into particular ICT solutions due to failures to make tender documentation sufficiently flexible and to allow for future vendor turnover (OECD, 2022^[49]).
- **Make-or-buy decision:** For the procurement of most common goods and services, the make-or-buy decision is implicitly resolved as “buy”. The existence of a competitive market may not, however, be the only dimension relevant to public buyers. For example, in the case of digital services, considerations such as security may outweigh immediate cost efficiency (OECD, 2022^[49]; European Union Agency for Cybersecurity, 2015^[50]). The difference in capabilities between the buyer and the market will also play a defining role in whether insourcing is even possible (e.g. a public buyer may be unable to insource a complex technological function of which it has little understanding). When considering insourcing instead of buying on the competitive market buyers must provide a clear justification.
- **Packaging decision (contract scoping):** For common goods and services, packaging or contract scoping decisions involve determining the optimal contract size. Larger lots can create savings through economies of scale or reduce risks such as coordination failures. However, they can also increase the risk of lack of competition, failure to promote SME participation or new entrants, and collusive behaviour by tenderers. Smaller lots can increase competition and weaken the conditions for collusion, while lots of different sizes can reduce the scope for market-sharing arrangements between tenderers. Dividing a procurement into lots can also help to avoid reliance on a single supplier and diversify risk (OECD, n.d.^[51]). If lots are defined too narrowly, it may open the door to direct awards, which often lack transparency and thus damage value. Additionally, when bidding is only allowed on a lot-by-lot basis, larger firms are not able to exploit efficiencies among multiple lots. This can lead to higher prices for each individual lot, compared to lower prices if firms were bidding for the total volume (OECD, 2018^[52]). Successfully balancing these risks requires a thorough market analysis to ensure that the contracting authority can estimate the number of potential suppliers in the market with reasonable accuracy, as well as ensuring that lots are structured and packaged in a way that promotes competition (SIGMA Programme, 2016^[53]). In this context, the OECD has developed a checklist to guide public procurement practitioners in splitting contracts into lots in ways that promote effective competition and value for money (OECD, n.d.^[51]).
- **The nature of the contractual relationship:** For the procurement of common goods and services, decisions on the contractual relationship are relatively straightforward and low risk. The value of the contract should be derived through competition and the use of exceptions to competitive tendering should be justified. Risk allocation through the payment terms is also generally standardised based on the goods or services being procured. However, contracting authorities must be careful that exceptions from the use of competitive procedures, such as extreme urgency, are not used inappropriately (OECD, 2015^[3]). Box 4.1 provides an expanded definition of the contractual relationship stage. For both common as well as complex goods and services the choices made in the scoping and contractual relationship phases directly guide the bidder selection process (the choice of the legal procedure).

Box 4.1. The nature of the contractual relationship

The contractual relationship between the buyer and the market (suppliers) is characterised by:

- The nature of cooperation between the buyer and the seller, i.e. does the contract derive its value through competition between potential suppliers (for the lowest price or best value for money) or collaboration between the buyer and a supplier (models such as Early Contractor Involvement, Alliancing, or Innovation Partnerships).
- The incentives (penalties/rewards) related to the objectives of the contract; for example, whether the payment mechanism lump sum, or rate based, or a target price principle.

In the case of bespoke goods and services such as infrastructure there are many options in terms of the nature of cooperation and incentives available, for which different procurement procedures can be applied.

The sequence and the boundaries of each procurement decision is of critical importance in the elaboration of a procurement strategy. Hence, the make-or-buy, packaging, and contractual relationship decisions are represented separately in this chapter. In the context of common goods, the choices relating to the contractual relationship are relatively few. The relevance of the above has been extensively presented in recent OECD work (OECD, 2021^[54]).

4.1.2. Risks in the tendering phase for common goods and services

Failures in the tendering phase frequently have direct impacts on value for money: lack of transparency, corruption, and inadequate bid evaluation can all result in reduced competition, either through a lower number of tenders or the creation of an uneven playing field. Risks in the tendering phase are often heightened by short timelines, which can have significant consequences in the implementation phase (OECD, 2022^[15]). Over-optimistic timelines are common and increase the risk of errors in the tendering phase. For example, they can result in failure of the procurement process or implementation problems caused by unrealistic tender preparation periods limiting the number of tenders and affecting their quality (European Commission, 2018^[20]).

- **Request for tenders and tender submission:** Risks in this phase generally threaten equal treatment, free access and non-discrimination of potential bidders and solutions. This can include failures to widely publicise invitations to bid, limiting participation, or the non-disclosure of information such as evaluation and award criteria, leading to weaker proposals. Failure to make potential bidders aware of contracting opportunities impacts transparency, equal treatment and competition, increasing the risk that procurements will not deliver value for money. Unclear technical or administrative processes to procurement opportunities can also limit the number of compliant bids received, reducing competition and value for money (European Commission, 2018^[20]; OECD, 2016^[12]). These risks can be exacerbated in the case of strategic procurement if bidders are unable to comply with more stringent criteria set by public buyers. This situation may impact the procurement process, causing, for instance, delays due to changes in the tender documentation.
- **Bid evaluation and award:** Risks in the evaluation and award stage include a lack of transparency in bid-opening procedures, breaches of confidentiality, the acceptance of non-compliant bids, and unreasonable disqualifications resulting in reduced competition. Factors such as inadequate technical expertise among evaluators can also increase the risk of errors and threaten the successful selection of the best tender, as can conflicts of interest or corruption in the evaluation process (SIGMA Programme, 2016^[55]). Finally, there are risks related to awarding contracts to bidders who cannot deliver, because their proposals are not economically viable, they are not compliant with basic legal

requirements or they lack the necessary financial resources, experience, skills, and technical resources (Sigma Programme, 2016^[56]).

4.1.3. Risks in the post-tendering phase for common goods and services

While risks that arise in the post-tendering phase frequently have their ultimate causes in earlier phases of the procurement process, they often need to be addressed or mitigated after the contract has been signed.

- **Contract management:** Contract management is the process of ensuring the supplier delivers and payments are made in accordance with the terms of the contract. Many risks in this phase have their root cause in failures to adequately plan for or mitigate risks in the pre-tendering phase (European Commission, 2018^[20]). Risks can involve the successful bidder not delivering, but also include a range of issues outside the contractor's control, such as supply chain deficiencies and environmental issues. Risks in this stage of the procurement process can include false accounting and cost misallocation, cost migration between contracts, inadequate invoicing systems leading to late payments, or false or duplicate invoicing for goods and services not supplied. Unjustified contract amendments or extensions, such as changes to allow more time and/or higher prices for the bidder, can hinder value for money and create compliance risks (Sigma Programme, 2016^[57]; OECD, 2016^[12]).

4.2. The procurement of complex goods, services and infrastructure introduces new and more severe risks

The procurement of complex goods, services and infrastructure faces different and often more consequential risks linked to more complex market structures, the size and length of contracts, and the interconnected nature of decision making. The procurement of custom or bespoke goods and services, such as in the procurement of innovation, involves procuring goods or services with uncertain or undefined elements. These procurements are inherently more complex and carry a greater degree of risk than the procurement of common and existing, off-the-shelf, items. Within this category there are further gradations of complexity and risk; for example, infrastructure mega-projects such as dams and underground transit lines introduce additional risk relative to less complex infrastructure projects such as minor road improvements.

Table 4.2. Overview of key procurement cycle risks for complex goods, services and infrastructure

Phase	Stage	Key risk
Pre-tendering phase	1. Needs analysis: Identification of needs, including engagement with stakeholders	Needs are not adequately or comprehensively identified
	2. Option appraisal: Analysis and selection of potential solutions	The wrong solution is selected
	3. Market analysis: Assessing the market's ability to respond to the procurement	The procurement strategy is badly informed
	4. Make-or-buy decision: Choosing which aspects of the delivery to manage or produce within the procuring organisation	Capabilities are incorrectly assessed and responsibilities inefficiently distributed
	5. Packaging decision: Grouping procurement requirements under a single or multiple contracts	Requirements are grouped in a way that reduces competition
	6. Contractual relationship: Choosing how to structure the contractual relationship between the buyer and supplier(s)	Risks are inefficiently allocated or incentive structure is misaligned
	7. Market engagement: Preparing the market to respond	Lack of response to the tender resulting in competition failure
	8. Bidder selection process: Choosing a procurement process available in the procurement legislation	Risk that the most efficient bidder will not be selected.
Tendering phase	9. Request for proposal/bid and tender submission: The process of issuing a request for tenders and receiving bids from potential suppliers	Lack of transparency, unequal treatment and competition failure
	10. Bid evaluation and award: The process of evaluating and selecting tenderers	The best value tender is not selected
Post-tendering phase	11. Contract management	The supplier does not meet their obligations

4.2.1. Risks in the pre-tendering phase for complex goods, services and infrastructure

- **Needs analysis:** Needs analysis for infrastructure and other bespoke or complex projects is often undertaken outside of the procurement cycle by a specialised function and can be part of the development of sectoral master plans or strategic planning. For example, a body such as a Ministry of Transportation may be responsible for developing a country's long-term plan for the highway sector, including a detailed analysis of the need for different highway projects. The number of stakeholders and complexity of systems increases the risks associated with needs assessment for complex or bespoke procurements.

In the case of common goods and services the procurement unit generally collects the data on what solutions are available on the market and based on those later appraises options. In the case of complex and bespoke goods and services other specialised functions will already have information on the general solutions available and options. Hence the sequence of phases in Table 4.1.

Table 4.2 will be different. For an infrastructure project, for example, design documentation will be developed (or procured) by the entity responsible for managing and delivering the infrastructure (e.g. a national highway company) through progressive steps. At option appraisal, cost and benefit inputs will be required, which are usually developed based on an outline design. The design may be further developed to full detail, depending on the procurement strategy chosen. Later, based on the preferred solution, the functional specification/technical requirements will be drafted, which will represent an input to the procurement function.

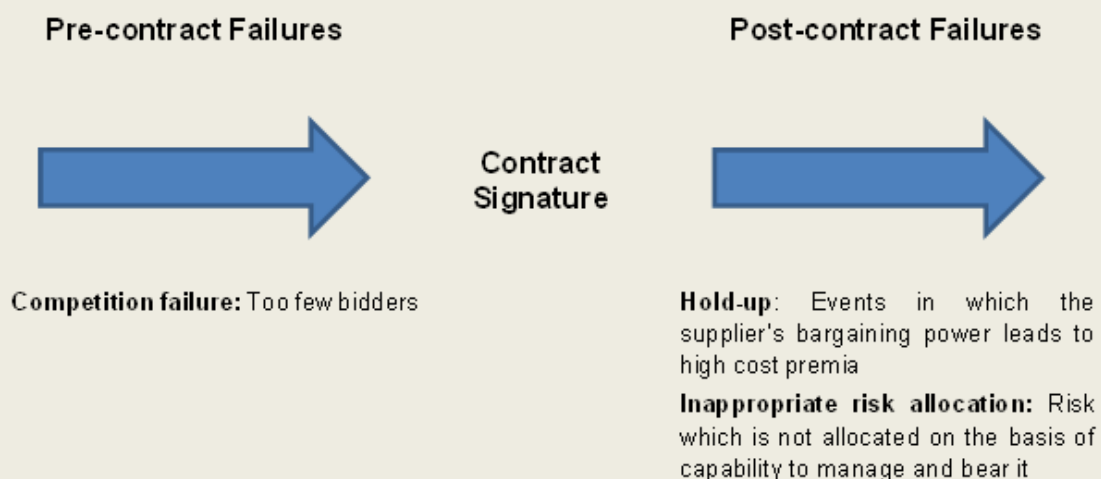
- **Option appraisal:** Option appraisal is also often undertaken by a specialised function outside of procurement, for example using cost-benefit or multi-criteria analysis. The range of options can be particularly complex due to the large number of factors to be considered and the long time periods often involved in complex procurements, which can make cost estimation more challenging. The potential social and environmental impacts of complex projects, for example large infrastructure investments, can make this step particularly critical. These factors are complex and can be difficult to quantify. Options appraisal methods help to manage the risk of overlooking or not selecting the optimal solution.
- **Market analysis:** For complex projects, market analysis should involve disaggregating a large project into economic activities⁴, and identifying the economic characteristics and the number of suppliers available per activity (as per the Support Tool for Effective Procurement Strategies (STEPS) method presented in Box 4.3). Supply chain concentration, the extent to which inputs are sole sourced or sourced with a high level of geographic concentration, can be a particular risk for bespoke procurements as they are more likely to require unique or specialised inputs. The limited number of potential suppliers also increases the risk of inadequate market engagement, leading to limited competition if suppliers lack the capacity to respond to tenders. The economic characteristics of activities informs the potential for procurement failures beyond low bidder turnout (see Box 4.2 below). Avoiding the supply chain risks discussed earlier applies to the level of economic activities and is highly relevant as well.
- **Make-or-buy decision:** The make-or-buy decision involves assessing which capabilities should be developed in-house, and which purchased from the market. When capabilities are available on a competitive market, outsourcing is preferred, however the procuring authority should aim to remain a competent buyer. Insourcing may also be used to avoid systematic supply chain issues. The correct decision will also be influenced by whether the buyer is procuring a one-off medium-term project, or a mega-project or portfolio of projects, warranting a longer-term investment in in-house capabilities. A more extensive consideration of the make-or-buy challenge is available in the literature behind STEPS, highlighted in Box 4.3.
- **Packaging decision:** For complex off-the-shelf and bespoke procurements, the packaging decision involves deciding not only whether the project should be procured through one or several contracts (so contract size), but also which activities should go into which contract. Contract scoping also concerns the vertical bundling of activities (e.g. bundling design and build and possibly subsequent operate and maintain activities). Bad contract scoping can result in very few bidders and/or high prices. For example, if certain component activities have only a small number of potential suppliers, tendering a project as a single contract will force the market to cluster around those suppliers, suppressing the number of bids. Conversely, breaking a procurement into too many contracts increases coordination risks and financial risk through loss of potential economies of scale. Similarly, bad scoping can exacerbate other procurement failures (see Box 4.2).

⁴ In line with the STEPS methodology economic activities are discrete parts of a project, which may be the functional elements of the project or integral parts of the functional elements. They can be defined by: (1) identifying the highest specialisation of the firms on the market, (2) determining technological boundaries between them (e.g. plumbing involves a different set of skills than electrical works), and (3) ensuring they are not financially trivial (OECD, 2022^[58]).

Box 4.2. Three key infrastructure procurement failures

The OECD's Support Tool for Effective Procurement Strategies (STEPS) identifies three key failures in infrastructure procurements:

1. **Pre-contract failures – competition failure** related to the creation of bundles of activities or contracts that will attract limited competition. When contracts are reasonably well-defined (i.e., complete), more competition or more bidders generally results in lower costs and better quality.
2. **Post contract failures – The hold-up problem** is a situation where the bargaining position of parties after contract signature can change due to a prior commitment already made by one of the parties. As contracts cannot include every eventuality, and if either contractual party has made a prior commitment from which it cannot back out without great loss, then a hold-up situation can emerge.
3. **Post contract failures – Inefficient risk allocation**, where risk is not allocated based on parties' ability to manage and bear it, the situation can result in cost premiums and create incentives for negative behaviour. This is more likely when buyers take a one-size-fits-all approach to risk allocation rather than analysing procurements and projects individually.



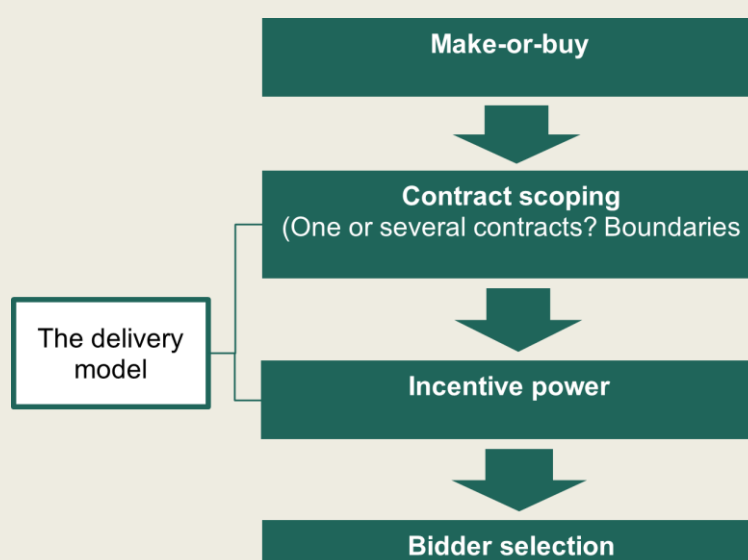
Source: (OECD, 2022^[58])

- **Contractual relationship:** As opposed to the common goods case, for bespoke goods there will be multiple combinations available with regard to the nature of how the contract derives value (competition for the best value or collaboration) as well as how meeting the objectives of the contract is rewarded or penalised (through the payment mechanism and other incentives in the contract). The targeted application of different contractual relationships on packages identified in the preceding phase of the procurement strategy helps maximise value for money, while one-size-fits-all approaches run the risk of significant inefficiencies.
- **Market engagement:** At this stage the preliminary procurement strategy must be tested through market engagement and if the market response is poor, another iteration of the strategy is necessary. The choices made in the packaging and contractual relationship phases directly guide the bidder selection process, whereas for common goods many more strategies are possible and can be applied through different legal procurement procedures (e.g. for example when an open bid competition with negotiation, competitive dialogue, or innovation partnership is more appropriate).

Box 4.3. The Support Tool for Effective Procurement Strategies (STEPS)

The procurement strategy of a major infrastructure project involves several key decisions, whereby each in its own right can contribute to the higher cost overruns and delays, higher cost of infrastructure even when delivered on time and on budget, and other issues. Table 4.2 illustrates these key decisions and their sequence. Mistakes in these decisions can lead to a low number of bidders, one-size-fits-all risk allocation, and other problems. The existing approaches for informing procurement strategies rely heavily on subjective judgement, do not cover the complete scope of the procurement strategy, or are tautological. STEPS is the first method available that helps inform these decisions in an evidence-based way, representing a giant leap forward. An effective application of STEPS can substantially reduce the cost of infrastructure, without increasing the level of conflict between supplier and contractor or significant reduction of the innovation potential.

The sequence of decisions in a procurement strategy



The first key question to be resolved is whether the capabilities of the procuring organisation are adequate, given the nature and frequency of infrastructure it must procure and the objectives it has been given. Once the scope (of the project) that has to be bought on the market is clear, the next decisions are whether it should be bought through one or several contracts (i.e. the packaging question), the nature of those contracts, and so on.

STEPS is meant to be applied after the project appraisal phase is complete and before any procurement related activities begin (including market engagement). Its application requires that at least an outline design of the project is available and is most effective when an initial detailed risk analysis is made beforehand. The latter is part of standard project risk management and should be done anyway.

STEPS can be applied on any product or service that requires customisation and cannot be bought off the shelf (e.g. all infrastructure, defence projects, industrial plants). A brochure of the tool and contacts in case of interest for its application can be found at <https://www.oecd.org/gov/infrastructure-governance/STEPS-brochure-april-22.pdf>.

The method was piloted on motorway infrastructure in Norway: “Procurement Strategy in Major Infrastructure Projects: Piloting a New Approach in Norway”, which is also the source of this text box.

Source: (OECD, 2021^[54])

4.2.2. Risks in the tendering phase for complex goods, services and infrastructure

- **Request for tenders and tender submission:** The request for tenders and tender submission process is broadly similar to the procurement of common goods and services, but documentation is likely to be more complex and greater interaction with bidders between release and submission is likely to be required. This complexity can increase risk; for example, the procurement of innovation often requires the use of more sophisticated procurement procedures involving multiple stages and a higher level of communication between bidders and contracting authorities. This requires additional resources on the part of contracting authorities and introduces additional points of failure where risks can materialise. When procedures which require significant pre-contract information exchange with one or several bidders in parallel are employed (e.g. competitive dialogue) the in-house capabilities to effectively manage such processes will be critical. Where multiple bidders share innovative solutions the protection of IP rights without stifling innovation may also be challenging.

Unsolicited proposals are an alternative to traditional procurement methods where the private sector takes the leading role in identifying and developing a project. While governments may see unsolicited proposals as a potential solution to a lack of capacity and an opportunity to develop innovative solutions, they introduce risks including the diversion of public resources from government priorities, poor value for money, integrity concerns, and a lack of transparency (World Bank Group, 2017^[59]).

- **Bid evaluation and award:** The bid evaluation and award process has to follow the legal provisions set down in legislation (as in the EU Directives for example). The distinction between common and bespoke goods and services is that in the latter case greater challenges may be present with regard to evaluation of bids. The customised products may be difficult to compare on an apples-to-apples basis, which may lead to disputes with bidders.

4.2.3. Risks in the post-tendering phase for complex goods, services and infrastructure

- **Contract management:** The contract management stage presents additional risks for bespoke and complex products. Monitoring quality is more challenging, as outputs are likely to be more complex and benchmarking more challenging. Projects are likely to be delivered over a longer time period and involve longer term relationships between buyers and suppliers, creating greater opportunity for risks such as supplier insolvency. If the procurement strategy was not adequate or for other exogenous reasons outside the purview of the procurement function (e.g. a global crisis), the procuring authority may find itself under pressure to renegotiate the contracts, leading to cost overruns, delays, or changes in the contract scope.

5

Developing a comprehensive public procurement risk management strategy

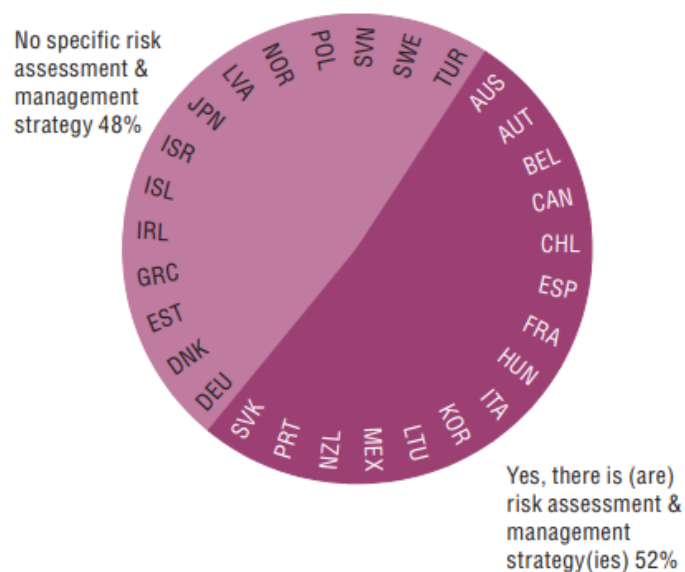
While elements of risk management are frequently incorporated into organisations' procurement processes, they are not always implemented in a comprehensive and structured way (OECD, HAICOP, 2020^[11]). This chapter provides steps and considerations for the development of a comprehensive risk management strategy for public procurement at the national level. Where a public procurement risk management strategy does not exist at the national level, entities should consider developing their own organisation-level strategies in line with international good practices.

Risk management is often implemented by public buyers without being formalised, communicated or documented, which hampers informed, systematic and adequate decision making. Therefore, to ensure the implementation of a coherent and streamlined risk management approach and to strengthen the resilience and efficiency of the procurement system, it can be beneficial to develop a national strategy.

A dedicated risk management strategy can also help to instil a risk management culture in public procurement. A comprehensive risk management strategy is also essential in informing the design and implementation of other critical policies, such as integrity and anti-corruption processes. Risk assessments support management in effectively identifying potential irregularities and inefficiencies up front, and therefore manage project resources and operations more effectively (OECD, 2018^[60]).

In 2019, 52% of OECD countries reported having developed a strategy for the assessment, prevention and mitigation of public procurement risks (see Figure 5.1). The development of public procurement risk management strategies is not limited to OECD countries. For instance, in the MENA region, the OECD supported Tunisia with the development of a comprehensive strategy on risk management in public procurement (HAICOP, OECD, 2019^[61]).

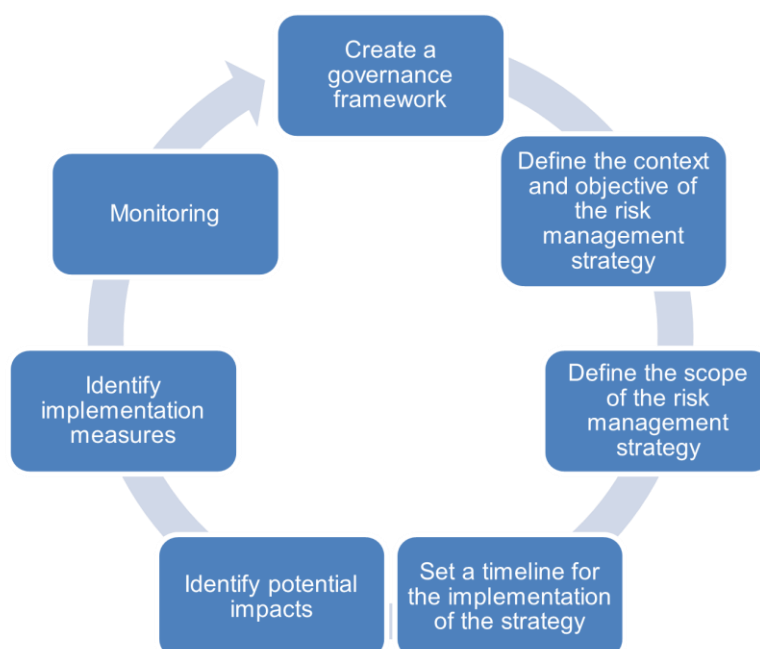
Figure 5.1. Existence of a strategy for assessment, prevention and mitigation of public procurement risks, 2018



Source: (OECD, 2019^[14])

The development of a risk management strategy requires following concrete steps. This chapter provides a guide to this process along the following sequence:

Figure 5.2. Process for the development of a risk management strategy



Source: (OECD, 2022^[15])

5.1. Creating a governance framework

The first step in developing a risk management strategy is identifying an entity responsible for developing and monitoring the risk management system. The OECD's *Checklist for Supporting the Implementation of the OECD Recommendation of the Council on Public Procurement* recommends developing risk management guidelines, tools and templates for public procurement entities, specifying the roles of the different stakeholders responsible for supervising public procurement processes and ensuring effective coordination and monitoring implementation of risk management processes and tools (OECD, 2016^[12]).

A steering committee or task force can play an important role in the effective implementation of a risk management strategy by guiding its development and supporting its adoption across the procurement system. This committee should be composed of the main stakeholders who will be able to anchor the strategy in the public sector and facilitate its adoption and implementation (OECD, 2016^[12]). It should gather key stakeholders around the table and define their commitments.

As the first step in a long-term solution, the creation of a steering committee or task force comprised of appropriate stakeholders should underscore the links between public procurement capacity building and the governance agenda. Ideally, all stakeholders should be brought together, including those who do not regularly interact with each other, such as contracting authorities, auditors and control bodies, and policy makers. A formalised governance body can also be useful to demonstrate to the wider public procurement community that building sustainable capacity requires more than short-term training of procurement staff by consultants (OECD, 2022^[15]).

While the steering committee should be made up of senior management, it is highly recommended to have advisory and working sub-groups composed of staff and representatives of specialised procurement services, as they can make significant contributions in terms of identifying practical issues that need to be addressed. Developing the strategy with the participation and input of different organisational units increases the likelihood that management and staff will implement the risk management strategy and assume responsibility for it, beyond seeing it as an additional compliance burden (OECD, 2018^[60]). Moreover, procurement officers and project managers are at the heart of the work of the procurement system and their expertise will contribute greatly to the whole strategy, particularly with regards to the needs assessment and the drafting of the action plan. Furthermore, shared ownership of the strategy will result in greater commitment to its implementation (OECD, 2022^[15]).

In this context, the key actors that will play a role in strategy development and implementation should be identified. It is common to find internal auditors, enterprise risk management specialists, compliance officers, internal control specialists, and other risk and control professionals working together to manage risk. These functions have specific perspectives and skills, but because duties related to risk management and control are increasingly split, careful coordination is required so that risk and control processes operate as intended (The Institute of Internal Auditors, 2013^[62]). Methodologies such as RACI (see Table 5.1) can enable a clear definition of the roles and responsibilities required for various tasks, processes and assignments.

Table 5.1. Clearly defining roles and responsibilities

Responsible	The individual who carries out the work.
Accountable	The individual who holds the ultimate accountability for the work being carried out and/or decision making.
Consulted	Individuals who should be informed and referred to prior to decision making or task completion.
Informed	Individuals who should be informed once decisions are made or upon work completion.

Source: Adapted from (OECD, 2022^[15])

5.2. Defining the context, objectives and scope of the risk management strategy

The context provides the rationale and basis for the development and implementation of the risk management strategy. The context includes:

- The existing legal, regulatory and policy framework, which can include legal instruments specifically governing public procurement, administrative regulations and policies, and procurement-related provisions in other legislation (e.g. anti-corruption legislation, competition rules).
- The institutional context, the entities who make up the public procurement system and their roles. In some cases, a specific entity may be tasked in legislation or regulation with responsibility for risk management.
- Existing risk management strategies, guidelines or policies that are broader than public procurement. The development of a procurement-specific risk management strategy should be sensitive to any broader strategies to avoid duplication of effort and confusion over responsibilities.

For example, Peru's Organismo Supervisor de las Contrataciones del Estado (OSCE) undertook a risk diagnosis of public procurement processes in 2020, which would form the basis for the development of a risk management strategy. The risk diagnosis was supported by a review of background documents and literature related to risk, integrity and public procurement, as well as interviews, focus groups and workshops with buyers, suppliers, specialists, academics and civil society. The subsequent strategy has two target audiences: the OSCE as a supervisory body, to support its oversight of risks in public procurement; and public entities, to facilitate their management of the public procurement system (Organismo Supervisor de las Contrataciones del Estado, 2020^[63]).

The strategy should identify clear objectives that are linked to the context discussed above, as well as the broader political, economic and market environment. The objectives will have an impact on the subsequent steps in the development of the strategy (i.e. scope of the strategy, implementation timeline, measures to implement, etc.). For instance, given the national context, the Tunisian strategy on risk management in public procurement identified five main objectives (HAICOP, OECD, 2019^[61]):

1. Strengthening the principle of good governance in public procurement.
2. Improving the efficiency and effectiveness of public procurement.
3. Formalising and standardising the risk management methodology and tools across Tunisian public entities.
4. Optimising the public procurement control system by focusing on high-risk areas.
5. Strengthening risk management capacities in public procurement in Tunisia.

Depending on the context and the objectives, risk management strategies can have different scopes. The scope should include all the activities that will ultimately affect the procurement outcomes of a product or a service, not just the procurement process itself. To define the scope of the risk management strategy, different factors need to be considered, including (OECD, 2022^[15]):

- The entities that will be subject to the strategy (i.e. central government departments or ministries, municipalities and regional governments, agencies, state-owned enterprises, etc.).
- The extent and depth to which risk management activities defined or mandated by the strategy will go.
- The goods, services and works the strategy will address, including any relevant thresholds. Governments should consider whether the strategy should include specific measures to actively manage risks related to large events and large infrastructure projects.
- The procurement stages considered (i.e. the whole procurement cycle, the pre-tendering stage, the tendering stage, etc.). Note that this decision can be particularly relevant for infrastructure

procurement, where the post-tendering or contract management stage can be long and present a very different set of risks.

Governments should ensure the strategy's context, objectives and scope are aligned. Objectives and scope should not be set that exceed what is possible or fall under the remit of other bodies under the legal framework and institutional context. Objectives should also not be too ambitious to be achievable, given the context, and the scope should not be so narrow that the strategy will not achieve its objectives.

5.3. Setting a timeline for the implementation of the strategy

Depending on the objectives, the scope of the strategy and the resources available (or committed), the strategy should include a detailed implementation timeline. A progressive approach is usually recommended, with the strategy initially applied to some sectors or types of entities. This approach allows for refinements and adaptations as the strategy is rolled-out, and can help to avoid overwhelming the public procurement system with a large simultaneous change. For instance, Tunisia decided to implement its risk management strategy within a timeframe of five years, starting with some key public entities (the pilots) before progressively targeting other entities from the central and then the local level (HAICOP, OECD, 2019^[61]).

5.4. Identifying potential impacts

The implementation of a new risk management strategy may, and often should, have impacts on public entities throughout the procurement system. While the benefits of adopting a risk management approach outweighs its potential cost, all these institutional or organisational impacts need to be taken into account (OECD, 2022^[15]).

The implementation of a risk management strategy in public procurement requires a strong and lasting commitment from executives and senior management, which should be communicated to all stakeholders involved in the public procurement system. In the absence of a risk management culture reinforced from the highest levels, risk management can become a “tick-the-box” exercise. Specific duties should be assigned and coordinated within and across entities. Without a cohesive, coordinated approach, limited risk management and control resources may not be deployed effectively, and significant risks may not be identified or managed appropriately. Specific roles should be assigned to coordinate effectively and efficiently among these groups so that there are no “gaps” in risk management practices nor unnecessary duplications. Clear responsibilities must be defined so that each group of procurement and risk professionals understands the boundaries of their responsibilities (The Institute of Internal Auditors, 2013^[62]).

In addition, the implementation of the strategy will have an impact on the organisational setting within public entities. Organisations should consider establishing a specific risk management committee or working group composed of a multidisciplinary team to oversee implementation and ongoing risk management activities. The formalisation of the risk management approach may lead to increased workload for some officials, particularly when taken seriously, but can pay off in avoiding future issues (OECD, 2022^[15]).

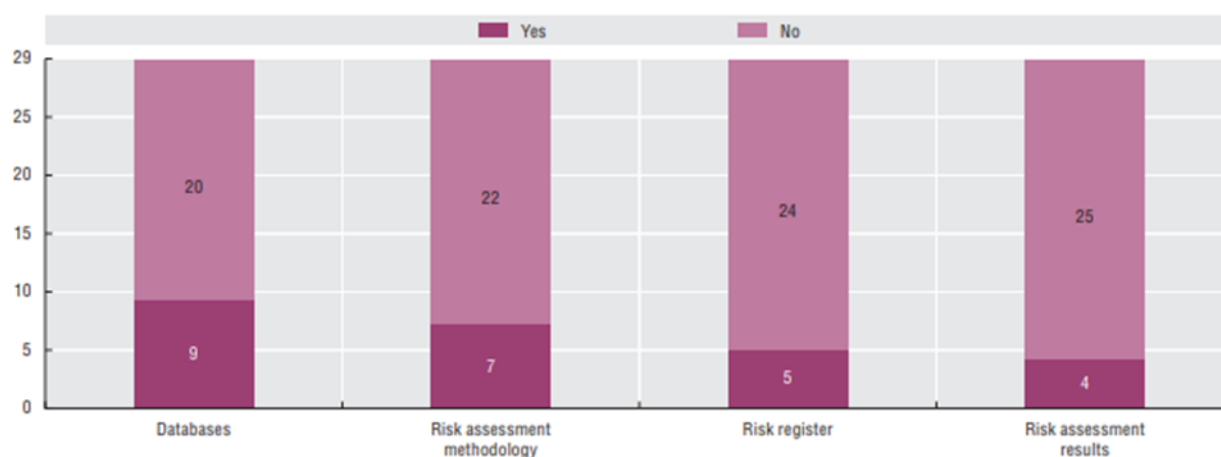
5.5. Identifying implementation measures

An efficient strategy forces the prioritisation of objectives and planned outputs that are achievable in a reasonable timeframe and with limited resources. The first step is to understand the available and potential resources. Once this has been evaluated, governments need to identify adequate implementation measures. These measures can include capacity building activities, practice sharing, and the development

of manuals and tools, some of which are described in greater detail in the section on applying the risk management process to public procurement. Governments should support implementation by defining clear risk management frameworks, strategies and implementation plans according to relevant international standards, tailored to public procurement and aligned with the public procurement risk management strategy (OECD, 2022^[15]).

The results of the 2018 OECD Survey on the implementation of the *Recommendation on Public Procurement* showed that a significant proportion (43%) of respondents had not implemented tools to assess public procurement risks (OECD, 2021^[7]). Among the tools that had been implemented, 31% of respondent OECD countries had developed risk databases, 24% had a risk assessment methodology, 17% had a risk register and 14% had risk assessment results (see Figure 5.3).

Figure 5.3. Number of countries with tools in place to assess public procurement risks, 2018



Source: (OECD, 2021^[7])

A key element of successful implementation is raising the awareness and knowledge of public procurement entities and other stakeholders about the integration of risk management processes within the procurement cycle. Other actions to facilitate implementation include inviting public procurement entities to relevant conferences and seminars on risk management strategies, engaging in communication to strengthen trust between stakeholders and control activities, organising awareness campaigns and events on the importance of integrating risk management activities into daily business practices, and providing trainings sessions and workshops to inform relevant public procurement entities about their risks and ways to handle the identified risks (OECD, 2016^[12]).

Risk management reinforces the need to enhance the capacity and capabilities of the procurement workforce and other stakeholders, as the effective implementation of a comprehensive and structured risk management system requires capable and trained personnel. Indeed, risk management activities follow a specific methodology that requires technical knowledge in both risk management and public procurement (OECD, 2022^[15]).

5.6. Monitoring the risk management strategy

Monitoring the implementation of the risk management strategy is necessary to identify best practices or unsuccessful solutions and eventually to adapt and update the strategy (OECD, 2016^[12]). This evaluation needs to be undertaken regularly and involve stakeholders from throughout the public procurement system. Risk management frameworks, tools and implementation plans should be monitored and revisited periodically to ensure they are meeting the needs of practitioners, addressing all relevant risks, are capable of meeting new or changing threats, and respond to changing environments (OECD, 2022^[15]).

6 Conclusion

Public procurement risks are consequential and their interlinked and connected nature mean that small failures can have large economic, environmental, social, and reputational impacts. This underlines the need for governments and public buyers to address risk management in a systematic way, addressing the full range of procurement risks. This includes supply chain risks, which are an increasingly prominent concern for public buyers, from the perspective of both responsible business conduct and resiliency.

Addressing the full range of risks in public procurement requires approaching risk management as a continuous process, with the steps of the risk management cycle regularly revisited through the procurement process to adapt to new circumstances and unforeseen events. Organisations can strengthen their risk management approaches by applying a wide range of tools, including data-based methods to complement qualitative methodologies. The increasing availability of data from a wide variety of sources creates opportunities and challenges for governments and contracting authorities to leverage these new tools in systematic ways, representing a promising avenue for further work.

While there are many common elements to a successful risk management approach, including the application of the risk management cycle and the importance of fostering a risk management culture, public buyers procure a diverse set of goods, services, and infrastructure. The procurement of complex goods, services and infrastructure faces different and often more consequential risks linked to more complex market structures, the size and length of contracts, and the interconnected nature of decision making. Procurement strategies should consider the complexity of the goods, services and infrastructure being procured and apply relevant risk analysis and considerations.

To ensure that risk management is being implemented in a comprehensive and structured way, governments should develop comprehensive strategies to manage public procurement risks. The implementation of a coordinated risk management approach can support informed and systematic decision making and strengthen the resilience and efficiency of the procurement system for the procurement of all goods, services, and infrastructure.

Annex A. Examples of Procurement Risk Control Measures

The table below presents risk factors and associated control measures throughout the public procurement process. This list is not comprehensive and risks may fall into multiple procurement phases and risk categories.

Table A.1. Examples of procurement risk control measures

Procurement Phase	Risk	Risk category	Example of control measures
Pre-tendering	Limited or lack of an adequate needs analysis	Operational	- Capacity-building activities on needs analysis - Involving end users in the definition and validation of needs (through surveys, meetings, questionnaires, etc.) - Preparation and publication of an annual procurement plan that includes information such as budget, expected timeline and a brief description of the need
	Limited or lack of adequate market analysis	Sustainability	- Capacity-building activities on market analysis - Development and use of standardised process and templates for market analysis
	Unequal treatment of economic operators	Regulatory/Compliance	- Ensure that relevant information is shared with all economic operators and keep records of meetings with potential bidders - Widely disseminate information about upcoming tenders and opportunities to participate in market consultations (e.g. through Prior Information Notices, entity's website)
	Poor quality of tender documentation (award and selection criteria, tender conditions, etc.)	Operational	- Increase capacity through sharing knowledge initiatives, training, and guidance notes with concrete examples - Establish process for review tender documentation
	Tender conditions favouring a specific economic operator	Regulatory/Compliance	- Establish a process for the validation and review of tender documents - Maintain accurate records of all meetings and consultations with potential bidders - Disclose all potential conflict of interests through formal declarations
	Choice of an inadequate procurement procedure/use of non-competitive procedures	Regulatory/Compliance	- Establish a process for the validation and review of the choice of procedures - Increase capacity on the use of procurement procedures - Introduce guidance on the use of non-competitive procedures

	Artificial contract splitting to fall below thresholds	Operational	Establish a process for the validation and review of tender documents
	Size of contracts limits the participation of SMEs	Economic and contextual	Include a mandatory division into lots in internal processes when possible
	Unbalanced contract terms (between contracting authority and suppliers)	Economic and contextual	- Assess and document which party is responsible for different risks and tasks - Ensure that the responsibility for different risks is clearly defined and balanced in tender documents
	Budget constraints and/or insufficient funding	Economic and contextual	Establish processes to obtain approvals and verify budget availability prior to commencing the tendering process
	Tender documentation with outdated/obsolete requirements (e.g. IT products and services)	Economic and contextual	- Focus on capabilities and functions rather than requirements in tender document specifications - Strengthen market analysis capacity
	Tender documents not addressing negative impacts on sustainability	Sustainability	- Strengthen strategic procurement capacity - Consultation with relevant stakeholders internal and external to government
	Lack of technical knowledge and expertise of procurement officials	Operational	- Ensure coordination and consultation with technical experts - Outsourcing drafting technical specifications (when there is a lack of expertise internally)
	Tendering		
	Numerous clarification requests from potential bidders and/or clarification responses not comprehensive	Operational	- Strengthen market analysis and engagement with the private sector - Establish process for validation of clarification responses (e.g. with technical experts)
	Limited competition	Economic and contextual	- Build the capacity of procurement officials on ensuring competition for a specific contract (procedures, award and selection criteria, minimum requirements, etc.) - Widely disseminate information about upcoming tenders (e.g. through Prior Information Notices, entity's website) - Preparation and publication of an annual procurement plan that includes information such as budget, expected timeline and a brief description of the need
	Bid rigging and collusion	Regulatory/Compliance	- Avoid unnecessary restrictions in the tender minimum requirements which may decrease participation of different bidders - Build the capacity of procurement officials on the identification of bid rigging patterns (e.g. development of analysis tools) - Avoid unnecessary meetings and other opportunities which may allow potential bidders to communicate
	Non-compliant bids	Economic and contextual	- Organise information sessions or capacity-building sessions to help potential bidders to submit compliant bids - Establish reasonable tender submission deadlines

	Abnormally low tenders	Regulatory/Compliance	• Request a comprehensive explanation supplemented by evidence and calculations from suppliers with abnormally low value • Strengthen the capacity on market analysis to evaluate the market price
	Conflict of interest amongst evaluation committee members	Regulatory/Compliance	• Disclose all potential conflict of interests through formal declarations and consider disqualifying members from participation to avoid any possible biases • Develop clear, measurable award criteria as much as possible
	Challenges from unsuccessful bidders	Operational	• Include contingencies for potential challenges in the procurement planning (i.e. in the procurement timeline) • Document all stages of the procurement process
Post-tendering	Lack of communication between suppliers and the contracting authority	Operational	• Organise a kick-off meeting to ensure mutual understanding on contract conditions and responsibilities • Seek to establish good working relationships by setting regular meetings to communicate expectations and issues • Provide feedback on progress reports and organise meetings to inform suppliers of requirements and timeframes for deliverables
	Increasing number of contract modifications	Regulatory/Compliance	• Establish a process and requirement for detailed justification of the need to modify the contract
	Delays in the performance of the contract	Operational	• Regular inspections and progress reporting • Establish contract conditions to incentivise performance (financial incentives, penalties, etc.)
	Supply chain failure leading to lack of goods/services required for the performance of the contract	Economic and contextual	• Identify critical goods and services and monitor supply chain • Develop contingency plans and consider diversifying sourcing
	Supplier does not meet environmental or social commitments	Sustainability	• Establish mechanisms to monitor implementation of strategic procurement requirements
	Bankruptcy of the supplier	Economic and contextual	• Use a rating of the financial capacity of suppliers and monitor those at risk of bankruptcy • Regular communication with suppliers at risk
	Legal disputes and litigation	Regulatory/Compliance	• Include dispute resolution mechanisms in the contract documents • Seek to establish good working relationships by setting regular meetings to communicate expectations and issues • Prepare and sign minutes of meetings to record discussions and agreed points
	Delays in payment	Economic and contextual	• Establish streamlined payment approval and processing processes • Develop forecasts of upcoming invoices

Source: Adapted from (OECD, Forthcoming^[64])

References

- British Medical Association (2016), *In good hands: Tackling labour rights concerns in the manufacture of medical gloves*, British Medical Association, <https://www.bma.org.uk/media/1093/in-good-hands-medical-gloves-report-web-23-03-2.pdf>. [43]
- Deloitte (2020), *Study on up-take of emerging technologies in public procurement*, European Commission, <https://ec.europa.eu/docsroom/documents/40102/attachments/1/translations/en/renditions/native>. [27]
- European Commission (2021), *Guidance on Innovation Procurement*, Official Journal of the European Union, [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021XC0706\(03\)](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021XC0706(03)). [31]
- European Commission (2018), *Public Procurement Guidance for Practitioners*, <https://doi.org/10.2776/461701>. [20]
- European Institute for Gender Equality (n.d.), , <https://eige.europa.eu/gender-mainstreaming/toolkits/grpp> (accessed on 3 October 2022). [47]
- European Union Agency for Cybersecurity (2015), *Security Framework for Governmental Clouds*, <https://www.enisa.europa.eu/publications/security-framework-for-governmental-clouds?v2=1>. [50]
- Gil, N. and Y. Fu (2022), “Megaproject Performance, Value Creation, and Value Distribution: An Organizational Governance Perspective”, *Academy of Management Discoveries*, Vol. 8/2, pp. 224-251, <https://doi.org/10.5465/amd.2020.0029>. [65]
- HAICOP, OECD (2019), *Stratégie de Management des Risques dans les Marchés Publics en Tunisie*, <https://www.oecd.org/gov/public-procurement/publications/strat%C3%A9gie-management-des-risques-march%C3%A9s-publics-tunisie.pdf>. [61]
- HM Treasury (2020), *The Orange Book: Management of Risk - Principles and Concepts*, HM Government, <https://www.gov.uk/government/publications/orange-book>. [9]
- Iakovou, E. and C. White III (2020), *How to build more secure, resilient, next-gen U.S. supply chains*, Brookings, <https://www.brookings.edu/techstream/how-to-build-more-secure-resilient-next-gen-u-s-supply-chains/>. [37]
- International Finance Corporation (2015), *Risk Culture, Risk Governance, and Balanced Incentives*, <https://www.ifc.org/wps/wcm/connect/fe5f3a6f-1241-46cc-89b9-c4be75e62a7c/IFC+Risk+Culture+Governance+Incentives+report.pdf>. [18]

- International Organization for Standardization (2018), *Risk management - Guidelines (ISO Standard No. 31000)*, International Organization for Standardization, <https://www.iso.org/obp/ui/#iso:std:iso:31000:ed-2:v1:en>. [8]
- International Organization for Standardization (2009), *Risk management - Vocabulary (ISO Guide No. 73)*, International Organization for Standardization, <https://www.iso.org/obp/ui/#iso:std:iso:guide:73:ed-1:v1:en:term:3.6.1.3>. [1]
- ITF (2018), *Private Investment in Transport Infrastructure: Dealing with Uncertainty in Contracts*, International Transport Forum, <https://www.itf-oecd.org/sites/default/files/docs/private-investment-transport-infrastructure.pdf>. [28]
- Kilpatrick, J. and L. Barter (2020), *COVID-19: Managing supply chain risk and disruption*, Deloitte, <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/About-Deloitte/gx-COVID-19-managing-supply-chain-risk-and-disruption.pdf>. [38]
- Makovsek, D. and M. Moszoro (2018), "Risk pricing inefficiency in public-private partnerships", *Transport Reviews*, Vol. 38/3, pp. 298-321, <https://doi.org/10.1080/01441647.2017.1324925>. [32]
- OECD (2022), "Enhancing the public procurement suppliers registry in Colombia", *OECD Public Governance Policy Papers*, No. 22, OECD Publishing, Paris, <https://doi.org/10.1787/36348f43-en>. [26]
- OECD (2022), *Global supply chains at work: A tale of three products to fight COVID-19*, OECD, <https://www.oecd.org/coronavirus/policy-responses/global-supply-chains-at-work-a-tale-of-three-products-to-fight-covid-19-07647bc5/>. [39]
- OECD (2022), "Integrating responsible business conduct in public procurement supply chains: Economic benefits to governments", *OECD Public Governance Policy Papers*, No. 14, OECD Publishing, Paris, <https://doi.org/10.1787/c5350587-en>. [22]
- OECD (2022), *Modernising Integrity Risk Assessments in Brazil: Towards a Behavioural-sensitive and Data-driven Approach*, OECD Public Governance Reviews, OECD Publishing, Paris, <https://doi.org/10.1787/ad3804f0-en>. [24]
- OECD (2022), "Public procurement in Lebanon: Towards a risk management approach", *OECD Public Governance Policy Papers*, No. 16, OECD Publishing, Paris, <https://doi.org/10.1787/b4285df1-en>. [15]
- OECD (2022), *The Support Tool for Effective Procurement Strategies: Informing the Procurement Strategy of Large Infrastructure and Other Bespoke Projects*, OECD, <https://www.slideshare.net/OECD-GOV/the-support-tool-for-effective-procurement-strategies-steps>. [58]
- OECD (2022), *Towards Agile ICT Procurement in the Slovak Republic: Good Practices and Recommendations*, OECD Public Governance Reviews, OECD Publishing, Paris, <https://doi.org/10.1787/b0a5d50f-en>. [49]
- OECD (2021), "Building resilience: New strategies for strengthening infrastructure resilience and maintenance", *OECD Public Governance Policy Papers*, No. 05, OECD Publishing, Paris, <https://doi.org/10.1787/354aa2aa-en>. [34]

- OECD (2021), "Enterprise Risk Management Maturity Model", *OECD Tax Administration Maturity*, <https://www.oecd.org/tax/forum-on-tax-administration/publications-and-products/enterprise-risk-management-maturity-model.htm>. [17]
- OECD (2021), *Fostering Economic Resilience in a World of Open and Integrated Markets: Risks, Vulnerabilities and Areas for Policy Action*, <https://www.oecd.org/newsroom/OECD-G7-Report-Fostering-Economic-Resilience-in-a-World-of-Open-and-Integrated-Markets.pdf>. [36]
- OECD (2021), *Global value chains: Efficiency and risks in the context of COVID-19*, OECD Publishing, <https://read.oecd.org/10.1787/67c75fdc-en?format=pdf>. [41]
- OECD (2021), *Mainstreaming strategic public procurement to advance regional development*, OECD Publishing, <https://www.oecd.org/gov/public-procurement/country-projects/public-procurement-and-cohesion-policy-objectives/FINAL-REPORT-Mainstreaming-strategic-procurement.pdf>. [30]
- OECD (2021), "Procurement strategy in major infrastructure projects: Piloting a new approach in Norway", *OECD Public Governance Policy Papers*, No. 06, OECD Publishing, Paris, <https://doi.org/10.1787/38996343-en>. [54]
- OECD (2021), "Promoting gender equality through public procurement: Challenges and good practices", *OECD Public Governance Policy Papers*, No. 09, OECD Publishing, Paris, <https://doi.org/10.1787/5d8f6f76-en>. [21]
- OECD (2021), "Strategic public procurement for delivering social value", in *Government at a Glance 2021*, OECD Publishing, Paris, <https://doi.org/10.1787/ade6df80-en>. [7]
- OECD (2020), *COVID-19 and Global Value Chains: Policy Options to Build More Resilient Production Networks*, OECD Publishing, <https://read.oecd.org/10.1787/04934ef4-en?format=pdf>. [35]
- OECD (2020), *OECD Public Integrity Handbook*, OECD Publishing, Paris, <https://doi.org/10.1787/ac8ed8e8-en>. [10]
- OECD (2020), *Public procurement and infrastructure governance: Initial policy responses to the coronavirus (Covid-19) crisis*, OECD Publishing, https://read.oecd-ilibrary.org/view/?ref=135_135391-eb6wiwbrmn. [6]
- OECD (2020), *Recommendation of the Council on the Governance of Infrastructure*, <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0460>. [4]
- OECD (2020), *Stocktaking Report on Immediate Public Procurement and Infrastructure Responses to COVID-19*, <https://www.oecd.org/coronavirus/policy-responses/stocktaking-report-on-immediate-public-procurement-and-infrastructure-responses-to-covid-19-248d0646/>. [45]
- OECD (2019), *Analytics for Integrity: Data-Driven Approaches for Enhancing Corruption and Fraud Risk Assessments*, OECD Publishing, <https://www.oecd.org/gov/ethics/analytics-for-integrity.pdf>. [23]
- OECD (2019), "Managing risks in public procurement", in *Government at a Glance 2019*, OECD Publishing, Paris, <https://doi.org/10.1787/8f1daa80-en>. [14]

- OECD (2019), *Reforming Public Procurement: Progress in Implementing the 2015 OECD Recommendation*, OECD Public Governance Reviews, OECD Publishing, Paris, <https://doi.org/10.1787/1de41738-en>. [5]
- OECD (2018), *SMEs in Public Procurement: Practices and Strategies for Shared Benefits*, OECD Public Governance Reviews, OECD Publishing, Paris, <https://doi.org/10.1787/9789264307476-en>. [52]
- OECD (2018), *Third Progress Report on the Development of the New International Airport in Mexico: Achievements and Lessons Learned*, <https://www.oecd.org/centrodemexico/medios/Full%20report%20EN.pdf>. [60]
- OECD (2017), *Getting Infrastructure Right: A framework for better governance*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264272453-en>. [13]
- OECD (2016), *Checklist for Supporting the Implementation of OECD Recommendation of the Council on Public Procurement*, <https://www.oecd.org/governance/procurement/toolbox/search/checklist-implementation-oecd-recommendation.pdf>. [12]
- OECD (2015), *Recommendation of the Council on Public Procurement*, <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0411>. [3]
- OECD (2014), *Guidance Document on Elements of a PRTR: Part I*, [https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono\(2014\)33&doclanguage=en](https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=env/jm/mono(2014)33&doclanguage=en). [29]
- OECD (2011), *OECD Guidelines for Multinational Enterprises, 2011 Edition*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264115415-en>. [42]
- OECD (n.d.), *Domestic policy tools: Minimize exposure to shocks*, <https://www.oecd.org/trade/resilient-supply-chains/procurement/>. [44]
- OECD (Unpublished), *Ensuring the Supply of Essential Goods: OECD Webinar March 25-26 2021*. [40]
- OECD (Forthcoming), *Public procurement risk identification in Malta*. [64]
- OECD (n.d.), *Public Procurement Toolbox*, <https://www.oecd.org/governance/procurement/toolbox/about/terminology/> (accessed on 25 September 2022). [2]
- OECD (n.d.), *Tool: Checklist for protecting competition when splitting contracts into lots*, <https://www.oecd.org/governance/procurement/toolbox/search/checklist-protecting-competition-splitting-contracts-lots.pdf> (accessed on 3 October 2022). [51]
- OECD, HAICOP (2020), *Guide de management des risques dans les marchés publics en Tunisie*, OECD, <https://www.oecd.org/gov/public-procurement/publications/Guide-de-management-des-risques-dans-les-marches-publics-en-Tunisie-comp.pdf>. [11]
- Open Contracting Partnership (n.d.), *What is the OCDS and why use it?*, <https://standard.open-contracting.org/latest/en/primer/what/> (accessed on 9 December 2022). [25]

- Organismo Supervisor de las Contrataciones del Estado (2020), *Diagnóstico y Estrategia para la Gestión de Riesgos en Contratación Pública*, <https://www.gob.pe/institucion/osce/informes-publicaciones/852130-diagnostico-y-estrategia-para-la-gestion-de-riesgos-en-contratacion-publica>. [63]
- Public Procurement of Innovation Platform Consortium (2015), *Guidance for public authorities on Public Procurement of Innovation*, Procurement of Innovation Platform, <https://s3platform.jrc.ec.europa.eu/en/w/guidance-for-public-authorities-on-public-procurement-of-innovation>. [19]
- SIGMA Programme (2016), “Division of Contracts into Lots”, *SIGMA Public Procurement Briefs*, <https://www.sigmaweb.org/publications/Public-Procurement-Policy-Brief-36-200117.pdf>. [53]
- SIGMA Programme (2016), *Market Analysis, Preliminary Market Consultations, and Prior Involvement of Candidates/Tenderers*, OECD Publishing, <https://www.sigmaweb.org/publications/Public-Procurement-Policy-Brief-32-200117.pdf>. [48]
- SIGMA Programme (2016), “Tender Evaluation and Contract Award”, *SIGMA Public Procurement Briefs*, <https://www.sigmaweb.org/publications/Public-Procurement-Policy-Brief-9-200117.pdf>. [55]
- Sigma Programme (2016), *Contract Management*, OECD Publishing, <https://www.sigmaweb.org/publications/Public-Procurement-Policy-Brief-22-200117.pdf>. [57]
- Sigma Programme (2016), “Selecting Economic Operators”, *SIGMA Public Procurement Briefs*, <https://www.sigmaweb.org/publications/Public-Procurement-Policy-Brief-7-200117.pdf>. [56]
- The Institute of Internal Auditors (2013), *The Three Lines of Defense in Effective Risk Management and Control*, The Institute of Internal Auditors. [62]
- The Institute of Risk Management (2011), *Risk Appetite and Tolerance Guidance Paper*, The Institute of Risk Management, https://www.theirm.org/media/7239/64355_riskapp_a4_web.pdf. [16]
- World Bank (2020), *Artificial Intelligence in the Public Sector: Maximizing Opportunities, Managing Risks*, World Bank, <https://openknowledge.worldbank.org/handle/10986/35317>. [33]
- World Bank Group (2017), *Policy Guidelines for Managing Unsolicited Proposals in Infrastructure Projects*, <https://ppiaf.org/documents/5367/download>. [59]
- Yellen, J. (2022), *Special address by US Treasury Secretary Janet L. Yellen on the future of the global economy and US economic leadership*, Atlantic Council, <https://www.atlanticcouncil.org/news/transcripts/transcript-us-treasury-secretary-janet-yellen-on-the-next-steps-for-russia-sanctions-and-friend-shoring-supply-chains/>. [46]