



Guide on Open Data Innovation Procurement for Municipalities

24 September 2018

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As this guide is a living document, input of examples and lessons learned are welcome. The updates will be published through the SCIFI website <http://smartcityinnovation.eu/> and the Agoria website <http://www.agoria.be/smartcities>.

To submit additional examples and lessons learned, please contact hello@smartcityinnovation.eu and ingrid.reynaert@agoria.be.



Executive Summary

This guide is addressed to local policymakers, who are responsible for setting long-term strategies for the public procurement of research and development (R&D) services (pre-commercial procurement; PCP) and for the public procurement of innovative solutions (PPI) related to open data. It intends to create awareness for public procurers of the economic and legal rationales for such procurement. Such awareness is necessary to drive policy implementation and execution.

Innovation procurement is an important tool at the disposal of policymakers. It holds the key to solving important societal challenges in the areas of health care, energy efficiency, transport, security, environmental protection, water and waste management or construction. To address these issues, the public sector often needs solutions for which often no commercially proven products exist yet and new R&D is needed. In these cases, PCP can then be used to compare the pros and cons of alternative competing solutions approaches. This will in turn enable the de-risking of the most promising innovations step-by-step via solution design, prototyping, development and first product testing. In other cases, challenges can be addressed by innovative solutions that are instead nearly or already in small quantity in the market and which do not require new R&D. This is when PPI can be used effectively. By developing a forward-looking innovation procurement strategy that uses PCP and PPI in a complementary way, public procurers can drive innovation from the demand side.

Using the aforementioned mechanisms, a number of different approaches to open data innovation procurement exist. Namely, these are either services to enable for the collection of open data, such as platforms or catalogues, and services using existing open data. The latter consists of direct services to citizens as end-users, to citizens through contracting authorities, or for contracting authorities themselves. Providing evidence for these approaches, best practice identified in this guide suggests that open data innovation procurement is at the level of purchasing systems which enable open data services. This is an important step that allows private actors to access and use the open public data to develop innovative applications/solutions and create economic value. However, project managers, procurers, and policy makers have joint responsibilities to ensure that private actors are also stimulated through public procurement to develop innovative open data solutions that solve public problems/challenges. Such procurements are necessary to improve public services, to support access to (new) markets by SMEs, and to improve European competitiveness in the sector of open data products and services.

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1 Introduction

Innovation procurement is an important tool at the disposal of policymakers to enable and drive developments in open data-related solutions for municipalities. It consists of the purchase of R&D services through *pre-commercial procurement* (PCP), innovations requiring incremental adaptation or design changes through the *public procurement of innovative solutions* (PPI), and *innovation partnerships* where a contracting authority works together with a single supplier through all developmental and commercialization phases. More specifically, *open data innovation procurement* refers to public procurement which is related to open data. Such procurement can also be conducted together with parties from other countries in the buyers' group - referred to as *coordinated or joint cross-border procurement*. For municipalities, these procurement mechanisms present opportunities to capture the innovative potential of the market while supporting SMEs, providing benefits to the contracting authorities themselves as well as to the public.

Capturing learnings and best practices is critical to the formulation of forward-looking innovation procurement strategies which drive these developments. This guide presents for the first time an overview of open data innovation procurement with particular focus on how it *is* being used and how it *can be* used for municipalities. An example of its use is for a municipality seeking to develop open data policies which include procurement approaches for smart cities.

The guide is structured as follows. First, definitions and background information on open data are presented to set the context. Next, after introducing the European framework for innovation procurement, legislative provisions and innovation procurement initiatives of France, the Netherlands, UK, and Belgium are discussed. To provide examples of the execution of such provisions in practice, the guide then highlights best practice use cases identified through empirical research. Next, considerations for joint cross-border procurement are presented. The guide concludes with a summary of the current state of open data innovation procurement across Europe, and recommendations to facilitate its further uptake by municipalities.

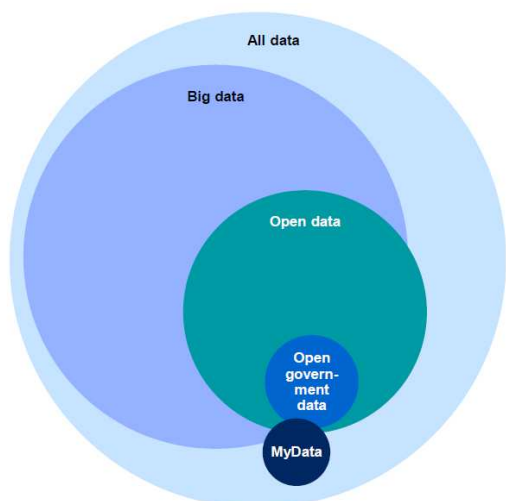
2 Introduction to open data

This section provides a definition of open data innovation, as well as the characteristics and properties of open data.

2.1 Definition of open data

Open data are digital data that have the technical and legal characteristics required to make them freely available for use, reuse and republish at anytime and anywhere, without restrictions from copyright, patents or other mechanisms of control. Data quality is one of the factors that affect the successful use of open data.

Open data sets also are defined in relation to other types of data, especially big data (Figure 1). Big data consists of large datasets that require specific analysis techniques because they cannot be handled in a conventional way, since they exceed the capacity of the usual technological tools for collecting, managing and processing data. open data is often big data, but small data sets can also be open. Open and big data are distinct concepts. Open describes how



liquid and transferable data are, and big describes size and complexity of data sets. The degree to which big data is liquid indicates whether or not the data are open.

The potential for open data depends on the adoption of a digital format that could be easily shared and analysed. Open data sets of governments and private players share the following characteristics¹:

Figure 1: The relationship between open data and other types of data. McKinsey Global Institute analysis. Open data: Unlocking innovation and performance with liquid information.

Accessibility: a wide range of users is permitted to access the data.

Machine readability: the data can be processed automatically.

Cost: data can be accessed free or at negligible cost.

Rights: limitations on the use, transformation, and distribution of data are minimal.

¹ McKinsey Global Institute analysis. Open data: Unlocking innovation and performance with liquid information. <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/open-data-unlocking-innovation-and-performance-with-liquid-information>

Data sets can range from completely open to completely closed across these four dimensions, as characteristics which can also be used to assess the degree of openness of a data set.

2.2 Sources of open data

Open data sets vary in scope and source. They can be local, national, or global. Sources for open data sets—whether big or small—can come from the government or other institutions and enterprises, and from individuals.

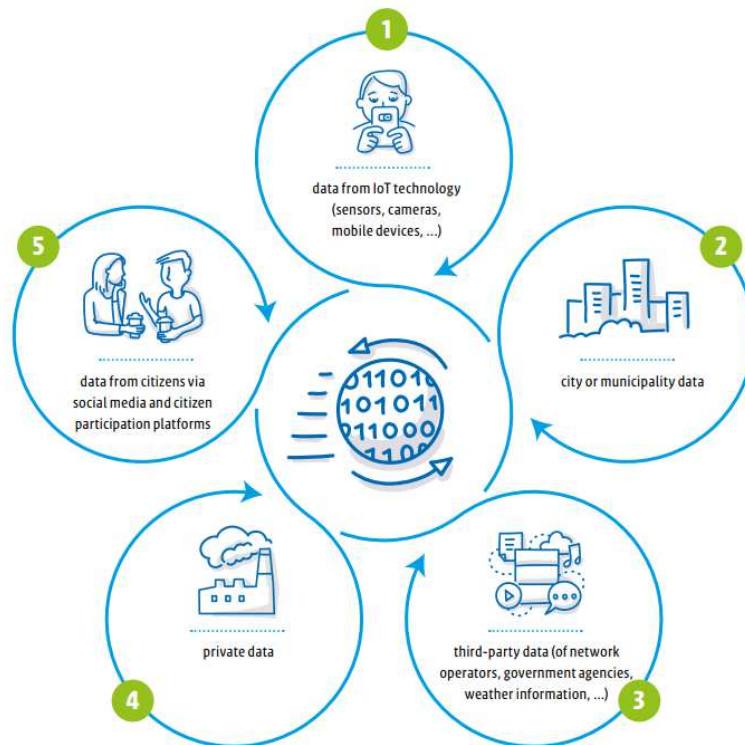


Figure 2: Agoria (n.d.) Data, the building blocks for cities and municipalities of the future.

https://acdn.be/_projects/smartcities/brochures/Whitepaper_Data_EN_Web.pdf

While there is a need of safeguards for personal privacy and business confidentiality, it is also necessary to invest in technology to maximize the potential of open data to create services and products hand in hand with organizational changes which also entail changes in mindsets and work processes.

2.3 The value of open data

Making information open and available improves transparency and accountability, unlocking large amounts of economic value. Capturing this value requires improving the efficiency and effectiveness of existing processes, making possible new products, services and markets, and creating value for individual

consumers and citizens. In this regard, innovation procurement can play a key role.

Data can be considered as the 21st century's most important raw material. An essential resource in order to achieve economic growth, job creation and societal progress. The capability to analyse and learn from data has the potential to facilitate better decision-making, leading to more transparency and a more sustainable environment. According to the EU Commission, the value of the EU data economy is foreseen to pick values beyond EUR 600 billion by 2020, representing 3.17% of the overall EU GDP, more than double of the 2015's value. Within the data economy open data plays a pivotal role, whose value will reach near 70 billion EUR in 2020.

At national level, open data portals are being developed and improved, increasingly backed by solid digital policies or specific open data policies. However, the use of open data can be as much as critical for sub-national public entities, supporting the cities for example in tackling many challenges that are currently facing: urban planning, waste management transportation, social inclusion etc. In a nutshell, open data can help cities become not just more sustainable, but smarter.

[*Building a European data economy*](#)² is part of the Digital Single Market strategy. The initiative aims at enabling the best possible use of the potential of digital data to benefit the economy and society. In this initiative, the Commission intends to unlock the re-use potential of different types of data and its free flow across borders to achieve a European digital single market.

In the [*Communication 'Towards a common European data space'*](#),³ the European Commission announces a series of upcoming measures meant to facilitate optimal access, sharing and re-use of public, publicly-funded and private data for a wide range of new products and services that would improve public services. . The Commission suggests a number of principles to be observed by public sector bodies when accessing private data. This would encourage the private sector to supply data that is highly relevant for informed government decisions (e.g. related to epidemics response, better urban planning, improved road safety and traffic management better environmental protection etc.).

"Providing access to dynamic data via application programming interfaces is particularly important, as it supports the open data ecosystem, saves time and costs through automation of the download process, and greatly facilitates the re-use of data for a wide range of new products and services. Sharing data via the correct and secure use of application programming interfaces can

² <https://ec.europa.eu/digital-single-market/en/policies/building-european-data-economy>

³ <https://ec.europa.eu/digital-single-market/en/news/communication-towards-common-european-data-space>

generate significant added value for different actors of the data value chain. It can also contribute to the creation of valuable ecosystems around data assets whose potential is often unused by data holders."

Towards a common European data space, COM(2018) 232 final. Retrieved from <https://ec.europa.eu/digital-single-market/en/news/communication-towards-common-european-data-space>

2.4 Applicable legislation to open government data

While this guide considered all open data and not just open government data (see Figure 1), this section outlines the legislation applicable to open government data due to its relevance for open data public procurement. The OECD defines open government data as a philosophy- and increasingly a set of policies - that promotes transparency, accountability and value creation by making government data available to all. Public bodies produce and commission huge quantities of data and information. By making their datasets available, public institutions become more transparent and accountable to citizens. By encouraging the use, reuse and free distribution of datasets, governments promote business creation and innovative, citizen-centric services.

The European legislation on the re-use of public sector information provides a common legal framework for a European market for government-held data (public sector information). It is built around two key pillars of the internal market: transparency and fair competition. The Directive on the re-use of public sector information, also known as the 'PSI Directive' (Directive 2003/98/EC) entered into force on 31 December 2003. It was revised by the Directive 2013/37/EU, which entered into force on 17 July 2013.

The Database Directive or the Directive on the legal protection of Databases adopted in 1996 may have in practice possible interaction with the Directive on the re-use of public sector information with regard to the exclusive sui generis right of database producers, valid for 15 years, to protect their investment of time, money and effort, irrespective of whether the database is in itself innovative ("non-original" databases). The Directive harmonized also copyright law applicable to the structure and arrangement of the contents of databases ("original" databases). The Directive's provisions apply to both analogue and digital databases.

The INSPIRE Directive is also relevant, as it aims to create a European Union spatial data infrastructure for the purposes of EU environmental policies and policies or activities which may have an impact on the environment. This European Spatial Data Infrastructure will enable the sharing of environmental spatial information among public sector organizations, facilitate public access to spatial information across Europe and assist in policy-making across boundaries. INSPIRE is based on the infrastructures for spatial information established and operated by the Member States of the European Union. The Directive addresses 34 spatial data themes needed for environmental

applications. The Directive came into force on 15 May 2007 and will be implemented in various stages, with full implementation required by 2021.

2.5 Cities strategy on open data

Data and integrated data are at the core of a smart city and essential instruments to support policy and to increase the comfort level of citizens. [The Smart Cities white paper: 'Data, the cornerstone for cities and municipalities of tomorrow'⁴](#) provides local policymakers with a hands-on approach on how to get started with data.

For a successful national open data initiative, the whole publication chain should be taken into account. Cities are crucial components of the open data publication chain. Specifically the larger European cities publish a lot of data on topics such as urban planning, tourism, and increasingly real-time data in the transport and mobility area, such as datasets on available parking spots. Moreover, cities also benefit from the use of open data to tackle typical urban challenges such as congestion and pollution, and to improve the quality of urban public services and the interactivity between the local government and citizens.

The [open data initiatives⁵](#) in Amsterdam, Barcelona, Berlin, Copenhagen, London, Paris, Stockholm, Vienna, Dublin, Florence, Gdansk, Ghent, Helsinki, Lisbon, Thessaloniki and Vilnius show the importance of cities having open data strategies in place, which are not stand-alone initiatives but are often embedded in broader digital or Smart City strategies.

Smart City strategies are important drivers for open data, as a more connected city and the deployment of smart devices (e.g. sensors on lamp posts to measure traffic density) result in a lot of useful data that can be used to enhance the quality of life in the city. This requires a solid data management system and a focus on stimulating the re-use of this data to tap the value that lies within it.

As part of the data management system, it is important to have a coordination mechanism in place at national level, in order to overcome interoperability barriers among various data portals. In this context, exchanges of best practices and experiences with partner-cities and institutions are particularly helpful for cities .

In order to stimulate re-use of data, cities should apply a clear Open License to the open data they are providing. Cities should also boost private actors' awareness on what can be done with the data by means of tangible examples and visualizations (e.g. separate city dashboards). Other initiatives to reach out

⁴ <https://www.agoria.be/WWW.wsc/rep/prg/ ApplContent?ENewsID=121633>

⁵ <https://www.europeandataportal.eu/nl/highlights/open-data-european-cities>

to citizens are often centred around the practical application of open data, such as local hackathons and meet-ups.

Not all cities apply a clear Open License to the open data they are providing. This hampers the re-use of the data, as it may lead to uncertainties on the side of the re-user on whether the data considered is free to access, use, modify and share. Only data which is shared with an Open License becomes open data.

1. The [European Innovation Partnership for Smart Cities & Communities \(EIP-SCC\)](#)⁶ combines Information and Communication Technologies (ICT), energy management and transport management to come up with innovative solutions to the major environmental, societal and health challenges facing European cities today.
2. [The Smart Cities Stakeholder Platform](#)⁷ is the collaborative, networking and knowledge sharing tool of Smart Cities and Communities. It collects and analyses input from all stakeholders in order to:
 - give advice to the High Level Group to feed into the Strategic Implementation Plan
 - provide detailed feedback to stakeholders who can use it to create their own activities and projects
3. The reference for open data in the European Union is [European Data Portal](#)⁸ whose mission is to improve accessibility and increase the value of open data in Europe. One of the initiative is the storage of the public sector information available on public data portals across European countries: about 600,000 datasets in over 34 European countries.
4. The instrument to appreciate the open data maturity in the EU is the [open data Maturity dashboard](#),⁹ that provides a breakdown of the state of open data in the EU and per country. The dimension used are two: the open data Readiness, assessing the span of their open data policies, and the open data portal maturity. More information, including the annual report on open data maturity can be found [here](#).¹⁰
5. The European Data Portal provides at this [link](#) a free training online.¹¹

⁶ <https://eu-smartcities.eu/>

⁷ http://ec.europa.eu/eip/smartcities/index_en.htm

⁸ <https://www.europeandataportal.eu/>

⁹ <https://www.europeandataportal.eu/en/dashboard#2017>

¹⁰ <https://www.europeandataportal.eu/en/highlights/open-data-maturity-europe-2017>

¹¹ <https://www.europeandataportal.eu/en/resources/training-companion>

2.6 Open government data - current state and challenges

With respect to open government data in particular, a number of challenges have been identified. While they are not directly related to open data *innovation procurement by municipalities* (i.e., the core focus of this guide), they are nevertheless outlined hereunder, to provide additional context as to the current environment in which policy makers, procurers and project managers make procurement decisions. The following challenges are taken directly from the Global open data Index (GODI) 2016/17 Report: The State of Open Government Data In 2017¹²:

- **Data gaps exist.** Open data is the final stage of an information production chain, where governments measure and collect data, process and share data internally, and publish this data openly. Does a government collect data at all? Why is data not collected? Some governments lack the infrastructure and resources to modernize their information systems; other countries do not have information systems in place at all.
- **Data findability is a major challenge.** Government agencies under one national government still publish data in different ways and different locations. Moreover, they have different protocols for license and formats. This has a hazardous impact - open data cannot be found even if it is out there, and therefore it cannot be used. Data findability is a prerequisite for open data to fulfil its potential and currently most data is very hard to find.
- **A lot of 'data' IS online, but the ways in which it is presented are limiting their openness.** Governments publish data in many forms, not only as tabular datasets but also visualizations, maps, graphs and texts. While this is a good effort to make data relatable, it sometimes makes the data very hard or even impossible for reuse. It is crucial for governments to revise how they produce and provide data that is in good quality for reuse in its raw form. For that, it is necessary to be aware of what is best raw data required which varies from data category to category.
- **Open licensing can be a problem.** On the one hand, more governments implement their unique open data license versions. Some of them are compliant with the Open Definition, but most are not officially acknowledged. On the other hand, some governments do not provide open licenses, but terms of use, that may leave users in the dark about the actual possibilities to reuse data. There is a need to draw more attention to data licenses and make sure data producers understand how to license data better.

¹² <https://index.okfn.org/insights/>

3 The European framework for innovation procurement

This section explains the background and rationale for the deployment of innovation procurement and describes alternative deployment approaches.

3.1 Pre-commercial procurement (PCP)

Pre-commercial procurement (PCP) was defined in 2007 in the EU's PCP Communication as a specific approach to procure R&D services that involves competitive development in phases and risk-benefit sharing under market conditions. PCP identifies the best possible solutions the market can develop, by comparing alternative solution approaches from different technology vendors in parallel.

In PCP, procurers act thus as demanding customers, who are articulating advanced solution requirements as potential future early adopters of the developed solutions (which will be selected in a separate PPI procurement that follows the completion of the PCP). By steering the development of innovative solutions towards concrete public sector needs, PCP may trigger industry to initiate R&D that was previously unthought-of.

Procurers also share the IPR related risks and benefits of undertaking new developments with the R&D providers in the PCP. IPR ownership rights are kept by the participating R&D providers, while the public procurers keep license free rights to use the developed solutions, the possibility to require participating R&D providers to license IPRs to third party providers at reasonable market conditions, and an option that enables procurers to call back the IPR ownership rights in case the participating R&D providers fail to commercialize solutions within a specific timeline after the PCP.

There is a clear separation between the PCP and the deployment of commercial volumes of end-products: the (potential) follow-up public procurement of innovative solutions (PPI).

3.2 Public procurement of innovative solutions (PPI)

Public procurement of innovative solutions (PPI) occurs when contracting authorities act as early adopters of innovative goods or services which are not yet available on a large-scale commercial basis. This also includes solutions based on existing technologies that are used in a new, innovative way. The solutions may have been (partially) demonstrated with success on a small scale and may be nearly or already available in small quantity on the market. However, due to residual risk or market uncertainty, the innovations are not being produced at large scale yet and do not meet market price/quality requirements of procurers for wide deployment yet. PPI is a specific approach for procuring innovative solutions in which procurers, unless they conducted a prior PCP, announce well in advance their intention to buy a significant volume of innovative solutions, in order to trigger industry to bring to the market solutions with desired quality/price ratios within a specific time.

The PPI mechanism is suitable in cases when, the required solution is close to the market and it is sufficient to signal the intention to buy a significant volume of solutions to encourage suppliers to invest in bringing the solutions to the market. Alternatively, for cases in which the solution still needs substantial R&D, active demand side steering is needed to ensure that developed solutions will meet all the procurers' requirements and suppliers are not likely to invest in developing in such solutions on their own.

Regarding the difference between PCP and PPI, PCP solely covers the procurement of R&D services stopping before commercialization activities take place (i.e., up to Technology Readiness Level 8). In this way, it is clearly separated from any potential subsequent purchase of commercial volumes of end-products. If R&D service providers - or other market players - successfully commercialize a solution which meets the needs of the contracting authority, then a PCP can be followed by a PPI in which that innovative solution is purchased.

3.3 Innovation partnership

The alternative to a PCP followed by a PPI is the *innovation partnership*. In an innovation partnership, a contracting authority works together with a single supplier or with multiple suppliers through the developmental and commercialization phases to procure the resulting innovation. It cannot be used for close to market cases that don't require R&D. While this mechanism has not yet been used with respect to open data innovation procurement, it is included here for consistency. Since activities exclude the supplier(s) from market competition throughout a long period of time, stricter state aid rules apply.

The European Commission will only presume that no state aid is awarded in exceptional cases when the procurer needs products or services that are so unique/specialized that the procurer is the only potential customer for the solution and there are no other potential providers on the market outside of the innovation partnership, that could be disadvantaged. When the procurer is the only customer, he has no other choice but to keep himself the IPR generated in the partnership (the IPR has no value for providers as there is no wider market beyond the procurer) and to pay the higher price for exclusive development.

The innovation partnership mechanism presents an additional disadvantage. It restricts the access of SMEs to the market because the combination of R&D and deployment into one procurement (1) raises the contract value to one large purchase that small companies cannot handle and (2) obliges SMEs to meet the stringent qualification and financial guarantee requirements, that normally only apply for deployment contracts, already from the start of the partnership before starting R&D.

The view of a large procurer on when to use PCP-PPI versus the innovation partnership procedure

"The differences between the 2 approaches (PCP/PPI and Innovation partnership) are really interesting and the use of one or the other method depends on the situation. If a special need of a particular (unique/highly specialized) solution is detected, the innovation partnership will be the best way to address this need. But indeed, the PCP/PPI approach offers a better overview of what it is possible to develop solutions to address global needs.

The separation of the 2 phases, R&D through PCP and procurement of the solutions through PPI, is much more secure for a procurer than the innovation partnership procedure, even more for a Central Purchasing Body as RESAH which represents many organizations and so many different needs".

Source: [Dominique Legouge](#), Director of the Réseau des acheteurs hospitaliers Région île-de-France (the central purchasing body for hospital procurement in the île-de-France region: www.resah.fr)

4 Innovation procurement in France, the Netherlands, UK and Belgium

This section provides an overview of the procurement law provisions that relate to innovation procurement and of relevant local/regional/national level initiatives that encourage the deployment of innovation procurement in four countries: France, the Netherlands, UK and Belgium.

4.1 Legislative provisions on innovation procurement

As a result of the transposition of the 2014 EU Procurement Directives, the procurement legislation specifically allows procuring authorities to include innovation-related considerations in the award criteria and in the special conditions relating to the performance of the contract.¹³

The procurement legislations in three of the four countries mentioned above (the Netherlands, UK and Belgium) also contain explicit definitions of innovation. In France, innovation procurement is defined in policy documents as the purchase of products which are not commercially available, but could probably be developed within a reasonable timeline, as well as the purchase of innovations that have the potential to significantly improve the public service compared to commercially available solutions. The purchase of social innovation is also included.¹⁴

Art. 1.1 of the Dutch Procurement Law (Aanbestedingswet 2012) defines innovation as the application of new or substantially improved product, service or process.

Art. 2 of the 2015 Public Contract Regulation in the UK defines innovation as 'the implementation of a new or significantly improved product, service or process, including but not limited to production, building or construction processes, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations, including with the purpose of helping to solve societal challenges or to support the Europe 2012 strategy for smart, sustainable and inclusive growth'.

Art. 2.32 of the Belgian Public Procurement legislation (Wet inzake overheidsopdrachten 2016/ Loi relative aux marchés publics 2016) defines innovation as 'a new or significantly improved product, service or process, including, but not limited to, production or building processes, a new sales method or a new organizational method in business operations, organization on the work floor or in external relations, meant to solve social problems or to support the European strategy for smart, sustainable and inclusive growth'.

¹³ See art.2.80(1) and art.2.115 Dutch Procurement Law; art.70 and art.76(8)(d) 2015 Public Contracts Regulations; art.81(3)(a), art.87 and art.157 Belgian Procurement Law

¹⁴ <https://www.economie.gouv.fr/dae/innovation>

Art. 25 (3:II:2) of the French consolidated version of public procurement rules¹⁵ (Décret n° 2016-360 du 25 mars 2016 relatif aux marchés publics modifié par Décret n°2017-516 du 10 avril 2017 - art. 3. Version consolidée au 04 mai 2018) indicates that contracting authorities may use the competitive procedure with negotiation or the competitive dialogue when the need is an innovative solution, such as new or significantly improved works, supplies or services. The Innovative nature may include the implementation of new production or construction processes, a new method of marketing or a new organizational method of practices, a new organization of the workplace or of the external business relations.¹⁶

4.2 Innovation procurement initiatives

In all four countries there are ongoing initiatives at national, regional and local level that aim to drive innovation through procurement. The most relevant of these initiatives are described below per country.

The Netherlands

SBIR program

In the Netherlands, innovation procurement in the form of pre-commercial procurement is supported through the Small Business Innovation Research ('SBIR') program. Public authorities are stimulated through co-funding and expertise to procure the research and development of innovative solutions. Although the program is not limited to small and medium enterprises (SMEs), it encourages their participation by applying short term contracts and phased approach. The SBIR takes place in 2 phases (feasibility study and applied R&D).¹⁷

Netherlands Space Office (NSO) and Rijkswaterstaat have launched in 2017 a call for innovative solutions to monitoring and analysing satellite data related to the ecosystem in the Eems-Dollard region in the Netherlands.

Source: Rijksdienst voor Ondernemend Nederland website.

¹⁵ The main French Public Procurement rules are: Ordinance no. 2015-899 of 23 July 2015, which is the global Framework of French public procurement; Decree no. 2016-360 of 25 March 2016, which contains the detailed, comprehensive rules set by the Ordinance; and Decree no. 2017-516 of 10 April 2017 which modifies the Decree of 25 March 2016 on various and heterogeneous subjects.

¹⁶ <https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000032295952>

¹⁷ See <https://www.rvo.nl/subsidies-regelingen/sbir>

Pact of Amsterdam

Another initiative with relevance for EU cities was hosted by Amsterdam in May 2016. EU Ministers responsible for Urban Matters signed the 'Pact of Amsterdam' and committed tackle complex urban challenges in a balanced, sustainable and integrated manner, by improving regulation, funding accessibility and knowledge availability. In this context, the signatory parties identified innovative and responsible public procurement as a Priority Theme and a powerful tool to address social and environmental objectives and to do more with less.

The United Kingdom

SBRI program

The Small Business Research and Innovation (SBRI) program is providing since 2009 expertise and financial support to procuring authorities who deploy pre-commercial procurements.

SBRI competitions are run around challenges for which solutions are not readily available. Innovative ideas are actively sought and it is accepted that a number of these ideas will not make it to the market. To address this, multiple projects are accepted into the process and risk is managed by using a phased development. Typically, projects go through two phases with the initial award winners having around £ 100,000 and around 6 months to prove the viability of their idea. Companies whose ideas are seen as being promising at the end of this feasibility phase are accepted into a second phase of around £ 1 million and 2 years in which they develop prototypes of their solution. This should ideally lead to a product being taken to market and open procurement in a 2-4 year timeframe".

Source: OGC, Driving Innovation through public procurement (2009)

Over £0.5 billion have been awarded in Research and Development contracts since the inception of the program in 2004, by over 80 public authorities. Following a positive evaluation, that estimated that the program generates important economic benefits, the UK government has renewed its support for the SBRI approach. Beginning of 2018, the government allocated to the SBRI program £20m over three years.¹⁸

¹⁸ See <https://innovateuk.blog.gov.uk/2018/03/13/sbri-more-than-1-billion-pounds-in-value-to-uk-economy/>; Study by Manchester Institute of Innovation with the Enterprise Research Centre and OMB Research Ltd.

Study - Encouraging Innovation in Local Government Procurement

The Local Government Association for England and Wales has released in 2018 recommendations on the policies and practices that local government could follow to deploy effective innovation procurement.¹⁹ The released Report stresses that the 2015 Public Contract Regulations do not inhibit innovative practices. The main issues to be overcome by local authorities are those of culture, procedure, and processes. At the same time, the Report notices that local authorities are increasingly aware of the pre-commercial procurements being performed within the SBRI program.

Industrial Strategy - green paper

In its recent Industrial Strategy (2017), the UK government has announced plans to stimulate innovation through procurement.²⁰ Among other means, the government announced the plan to release/publish new guidance on:

- Effective engagement with innovative market players during the preparatory phase of a procurement;
- Defining outcome-based specifications, allowing for the broadest range of (innovative/alternative) ideas to be proposed by market players;
- Using benefits-sharing mechanisms (e.g. contract extensions for positive innovation results) meant to incentivize contractors to identify innovative solutions to add value or make cost savings during the execution of public contracts;
- Ensuring intellectual property is held by the party best placed to exploit it (which may often be the supplier)

As part of the same Industrial Strategy, the UK government has also committed to raise SMEs' share of central procurement to one-third by 2020 and to ensure all major government authorities sign up to the Prompt Payment Code, promising to pay suppliers, including small businesses, promptly and fairly.²¹

¹⁹ Encouraging Innovation in Local Government Procurement (2017)

²⁰ Building our Industrial Strategy: Green paper (January 2017).

²¹ Building our Industrial Strategy: green paper (January 2017) p.71

France

Support for innovation through public procurement

In France, the government has set in 2012 the target to spend 2% of the public spending on innovation (including R&D) by 2020.²² The State Department for Public Procurement is in charge of deploying this innovation procurement policy. To this end, it focuses on the following measures:

- Support the uptake of innovation targets in individual procurement strategies: Ministries are currently publishing long-term plans for procurements of innovative solutions, in order to inform innovative companies of upcoming procurement opportunities
- Raise awareness among public procurers regarding the importance of innovation procurement
- Simplify the communication between public procurers and innovative players: To this end a Platform was created to allow companies to present their innovative solutions and procurers to anticipate their needs for innovative solutions before the publication of a call for tender. The Platform is intended to facilitate communication between procurers and innovators and increase procurers' knowledge of state-of-the-art.²³

UGAP, the French central purchasing body, is supporting contracting authorities in deploying procurements of innovative solutions, in particular by facilitating the dialogue with relevant market parties.²⁴

Belgium

Study - Barometer Innovative Public Procurement in Belgium

A study commissioned by the Belgian government in 2017 sheds light on the concept of innovation procurement and identifies the major challenges to deployment as being a lack of an innovation legislation. This is in terms fo a lack of a procurement legislative framework that would underlie a more innovative way of procuring and provide the necessary flexibility in procedures. (p.3)

For mitigating measures, the study proposes that contracting authorities:

- start from the needs of the customer/end-user

²²

https://www.economie.gouv.fr/files/files/directions_services/dae/doc/circulaire_5681_20130925.pdf

²³ <http://www.achatspublics-innovation.fr/>

²⁴ <https://www.ugap.fr/>

- adopt a more risk-taking attitude
- adopt a value-for-money approach
- enable dialogue and knowledge sharing between the government and innovative companies by establishing an innovation network
- encourage participation of small firms by informing them about upcoming procurements and by describing the procurement challenge in terms of performance and functionalities rather than in detailed terms.

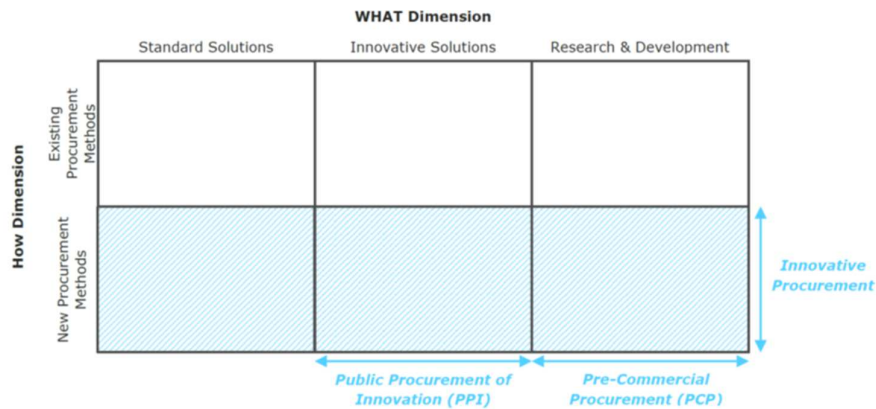


Figure 3 - Bi-dimensional conceptualization of innovation procurement (Source: Barometer Innovative Public procurement in Belgium (endorsed by Minister Vandeput, June 2017))

Flemish Program for Innovative Public Procurement ('Programma Innovatieve Overheidsopdrachten')

In 2016, the Flemish Government launched the regional Program for Innovative Public Procurement. The program encourages the various public sector organizations to purchase Research & Development and Innovative Solutions, rather than consistently turning towards traditional standard solutions. By submitting proposals, the purchasing organizations can receive information, guidance, and even co-financing throughout the purchasing process.

The objective of the program is to encourage the purchase of innovative solutions, that have the potential to modernize public services and solve societal problems as well as to support innovative companies to grow.²⁵

Flemish Department of Mobility and Public Works

Initiatives meant to encourage innovation procurement have also been undertaken by individual procuring authorities. The Flemish Department of Mobility and Public Works, for example, has set-up the workgroup 'Procurement 2.0', which

²⁵ Barometer Innovative Public procurement in Belgium (endorsed by Minister Vandeput, June 2017)

outlined improved procurement tools (procedures or contractual models), meant to stimulate bidding companies to offer innovative solutions.

NIDO lab

At federal level, the Belgian Ministry of Public Affairs has launched the NIDO (Nurturing ideas, developing opportunities) lab initiative, an innovation lab which encourages public authorities to explore innovative solution in concrete. NIDO also explores the role of innovation procurement in facilitating SME's and start-up's access to public contracts.

5 Guidance for innovation procurement - the Business Case Methodology

This section describes the steps to be undertaken by a public authority, before, during and after the deployment of an innovation procurement. This process is referred to as the "business case methodology," as was refined and piloted by Vtrek and Corvers based on the eafip guidance to innovation procurement.²⁶ The methodology is applicable to all innovation procurement, which includes open data procurement falls under, such that recommendations for innovation procurement are equally and directly applicable to open data procurement. In cases where additional attention must be paid to particular elements regarding open data, these are also mentioned within this guide. As well, while it is also applicable to all types of contracting authorities, where appropriate specific considerations are also mentioned for local governments.

The business case methodology consists of defining sources of costs and benefits as they relate to common needs, the innovation gap between current solution and that which would meet the needs, and the costs/benefits/risks associated with provision of the necessary solution by the market. These high-level steps can be used as a framework to gather information on processes from prior procurements in an organized and structured manner, evaluate procedural successes and issues to learn from. As well, the business case methodology can be used on a project-by-project basis to incentivize interest by communicating a sound value proposition to organizations considering becoming part of the buyers' group.

It is important to mention that the costs, benefits, and risks discussed here in many instances can be either qualitative or quantitative in nature. This is in order to support a thorough analysis of all of the relevant aspects to planning an innovation procurement, and using which contracting authorities must make informed decisions. An important distinction can be made here between a public sector business case and a conventional one for the private sector. For contracting authorities, public welfare considerations are central to value calculations; those which go beyond conventional cost-benefit analyses which include only financial changes and return on investment, for example. As such, this methodology has been developed to enable for the inclusion of wider benefits in this regard, and reference to costs and benefits should not be interpreted solely in financial means.

- **Examples of quantitative information:** technology purchase costs, required quantities, implementation timelines, number and size of suppliers

²⁶ The eafip (European assistance for innovation procurement) methodology was developed by Corvers during the eafip initiative (2014-2018) of the European Commission.

- **Examples of qualitative information:** functional user requires, technical specifications, market openness, tacit knowledge, innovativeness, willingness to cooperate

In Figure 1, below, we provide an overview of the 5-step approach to innovation procurement. Each of these steps are further detailed in the following sections.

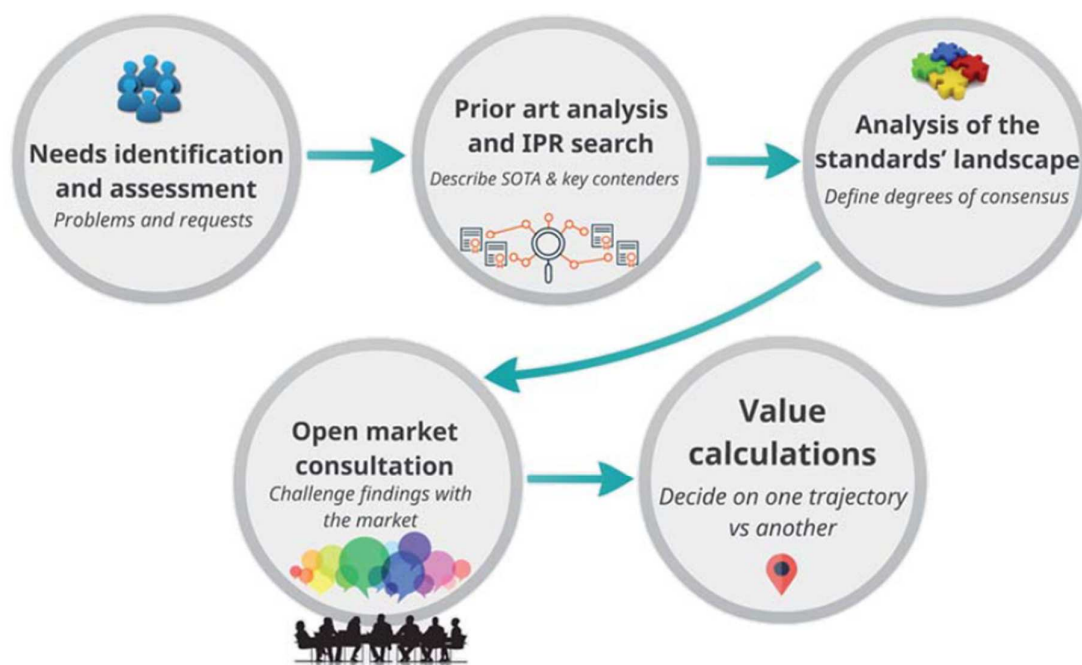


Figure 4 - The 5-step approach to innovation procurement

5.1 Needs identification and assessment

In developing a business case, the first step is to clearly define the need for which any future action might yield an innovative solution. An internal procedure can be used, where procurers gather information from end-users regarding their needs (e.g. patients/nurses that would eventually need to use the innovative solution). In cases of co-operative or joint procurement when procurers partner with others who deliver similar services of public interest, needs definition can become more complex as the number of actors increase - but the benefits of the purchase are also amplified due to the potential for interoperability and cost reduction.

An important outcome of this step is the estimation of the negative impact the identified problem has on the delivery of the public service (e.g. traffic congestion that decreases road safety and work productivity) or the estimation of the business-as-usual costs if the same solution would be implemented, rather than the result of a PPI or a PCP+PPI. These costs can be both monetary and non-monetary.

Empirical research has identified that approximately half of local contracting authorities consult the users of public services, which is higher than the averages for either regional or central authorities.²⁷ This suggests that municipalities find it more important or receive less barriers in consulting end-users of services, possibly due to their closer proximity to citizens. Also, given that municipalities typically procure at later stage of development, such as through PPI or off-the-shelf, they may face challenges in identifying the value of investing into R&D through a PCP.²⁸ This has may have a negative effect on the uptake of open data innovation procurement.

With respect to open data, user needs can be related to either services to enable for the collection of open data, such as platforms or catalogues, or services using existing open data. The latter consists of direct services to citizens as end-users, to citizens through contracting authorities, or for contracting authorities themselves.

5.2 Identify room for innovation - The Prior Art Analysis

This step is crucial for distinguishing between whether a PCP or a PPI is required, based on comparing the current state-of-the-art with what is required to meet user needs. In the prior art analysis, publicly available information on existing products, patents (IPR), standards, and research is examined. During the prior art analysis, the procurer will gather information on potential solutions that can subsequently be assessed and compared by using the business case methodology. Areas of assessment include benefits which can be offered by the solutions to the requirement, estimated costs of solutions as well as remaining risks, such as estimated risk of failure during follow-up R&D and subsequent implementation. The available budget can also help to determine the choice of the solution to be pursued. Depending on the particular situation, a procurer may be interested in selecting a project area in which a PCP has the potential to result in IPR and wider market revenues that may help to mitigate the risks associated with a high investment in R&D services.

The prior art analysis requires technical expertise; when no in-house expert exists, as is more likely for smaller municipalities, then this expertise should be sought from external sources. Trends for local governments to consult

²⁷ Rainville, A. (2016). "From Whence the Knowledge Came: Heterogeneity of Innovation Procurement across Europe." *Journal of Public Procurement* 16, no. 4 (Winter 2016): 463-504.

²⁸ Rainville, A. (2016). "From Whence the Knowledge Came: Heterogeneity of Innovation Procurement across Europe." *Journal of Public Procurement* 16, no. 4 (Winter 2016): 463-504.

external experts²⁹ provide some evidence that external knowledge is being used to supplement such procurement planning actions; however based on the relatively low procurement of solutions requiring R&D by municipalities this support is not likely to be for such a prior art analysis. A clearly identified need related to open data, with benefits envisioned from intervention through a particular procurement, can help to leverage project funds for receiving the support required to achieve the benefits.

IPR search

The IPR search focuses on the analysis of registered intellectual property, from either national or international databases or using a search platform. It is recommended to use the later, such as [IPlytics platform](#),³⁰ as this steeply decreases the time, effort, and expertise necessary to perform a comprehensive patent search. Such tools can provide additional analytical capability based on integration of datasets, big data analysis, and indicators such as technical relevance and market coverage.

Whenever the analysis reveals that relevant solutions are still at the R&D stage, a PCP can be considered. When relevant solutions have moved beyond R&D but are not widely commercialized and may require conformance testing, a PPI can be considered by the procurer. Finally, whenever the prior art analysis reveals that the desired solution is readily available on the market, the procurer can proceed with a normal procurement.

Additionally, the IPR search will indicate whether market entities already possess IPR that is needed to develop the desired innovative solution. This will prompt the procurer to investigate whether designing around the blocking IPR is possible or whether licensing agreements can be reached (e.g. during the open market consultation). When neither of these two options are viable, the procurer may decide not to proceed with assessment and comparison between these technological trajectories.

Analysis of the standards' landscape

Choosing the right standards is critical to supporting open data public procurement, as its success hinges upon consensus between multiple stakeholders in the public and private realm which must be translated into the technologies and services procured. In public procurement, agencies may use a variety of

²⁹ Rainville, A. (2016). "From Whence the Knowledge Came: Heterogeneity of Innovation Procurement across Europe." *Journal of Public Procurement* 16, no. 4 (Winter 2016): 463-504.

³⁰ <http://www.vtrek.eu/our-digital-tools/iplytics>

types of standards, technical specifications, or eco-labels provided that they are based on:

"scientific information using a procedure in which stakeholders, such as government bodies, consumers, manufacturers, distributors and environmental organizations can participate" ³¹

The procurement directives cite national standards transposing European standards as the most preferable for technical specifications, for application "without prejudice to mandatory national technical rules" ³². Voluntary standards act within a given sector to uphold product or service quality, security, information and conformity. An important component of the business case methodology is to conduct a scan of standards inventories to identify whether there are relevant standards to apply within the planned procurement (e.g. consider costs related to the lack of open standards or of interoperability standards). Inventories can be national, European, international, or even sector-specific associations for de facto standards where approved by European legislation. An example of the latter is for ICT standards.³³ Especially if they have no internal technical team, procurers might approach a national standards development organization for assistance in developing this inventory; a search platform such as IPlytics can also provide support in this regard.

Whenever appropriate standards exist, the procurer may require suppliers in a PCP or PPI to develop innovative solutions that are compliant with these standards. Standards support greater competition among companies around the desired qualities of the procured product or service, allowing the procurer to choose between a larger number of products that meet these (minimum) requirements and at a lower cost. For PPI, many types of standards are relevant to procurers, and can differ according to the degree of innovation that must take place to meet the procurer's need. For example, measurement / testing / interface and compatibility standards are more relevant when more work must be done to adapt an existing solution. If only minor changes are needed, standards for variety reduction, quality, or information become more relevant.

For procurers whose advanced needs can be met by solutions that require significant R&D, a potential absence of relevant voluntary standards leaves room for standardization efforts to amplify the impacts of a PCP. This is often the case before open data policies have been implemented, where procurers may be locked into a single supplier with a vendor-specific standard. Procurers can

³¹ EC. (2008). "Towards an increased contribution from standardisation to innovation in Europe: Commission of the European Communities." Brussels: European Commission.

³² EC. (2008). "Towards an increased contribution from standardisation to innovation in Europe: Commission of the European Communities." Brussels: European Commission.

³³ EC. (2014). "Commission Implementing Decision of 3 April 2014 on the Identification of Ict Technical Specifications Eligible for Referencing in Public Procurement (Notified under Document C(2014) 2120) (2014/188/Eu)."

draw upon different standards at each phase of a PCP, such as terminology standards during phase 2, and measurement/testing standards during phase 3.³⁴ After each of these phases, de facto standards can be created based on knowledge generated within the phase, and used to define requirements for subsequent phases. These emerging open standards help to define the requirements, systems architecture, and protocol or testing that support a successful solution. More formally, procurer engagement within official standardization bodies can speed the time to market of innovative solutions and can ensure future interchangeability between alternative solutions being developed during the PCP.

5.3 Open market consultation

Based on the information collected during the previous steps, the procurer could then perform preliminary calculations to estimate whether the foreseen project is sufficiently attractive to continue to more in-depth analyses. For those projects where preliminary calculations suggest investing further time and money has sufficient value, the procurer may organize an open market consultation to gain more detailed information to contribute to (economic) planning. This consultation is open in the sense that many suppliers are invited. Market consultation can also extend the influence of public procurement, through market signalling.

The intention of the market consultation is to gather information from market players / innovators regarding the cost and quality of existing and potential solutions, such as ongoing research and their potential to yield relevant solution to procurer's problem / need. This will help the procurer to check whether the first assumptions made in the business case (e.g. expected benefits, expected costs, remaining risks) reflect realistic prospects. As such, there is a degree of overlap between the market consultation and calculating the value of a project. Testing the preliminary model through the market consultation adds a degree of rigor, and provides additional information for more accurate estimates.

The ability for market consultation to reveal sufficient information to support a rigorous business case depends to a large extent on the readiness of the market players to share information. Within the legal boundaries meant to prevent distortions of competition (e.g. the same information is conveyed to all participants; the market players are not agreeing on price fixing or market sharing), different strategies can be deployed by the procurer in designing market consultations that are conducive to information sharing. Some examples of these are one-on-one discussions, market surveys, poker planning

³⁴ Rainville (2017). Standards in green public procurement - A framework to enhance innovation. *Journal of Cleaner Production*, Volume 167, pp. 1029-1037, <https://doi.org/10.1016/j.jclepro.2016.10.088>.

techniques,³⁵ and the use of an intermediary to act as a facilitator of discussions between public and private actors.

The success of the market consultation also depends in part upon the capabilities of the contracting authority to structure it in such a way as to gain insightful and truthful information from market parties. While contracting authorities at the municipal level have strengths in consulting users to identify needs, they often have comparative challenges in consulting the market.³⁶ External specialists can provide the support necessary for especially smaller municipalities to perform this step of the business case methodology.

Compliance with the TFEU principles and safeguards for companies

Open market consultations are expressly regulated under the public procurement directives. Compliance with the TFEU principles of equal treatment, transparency, non-discrimination, proportionality and competition is a must.

To encourage good feedback from the market ensuring that companies are treated equally and competition is not distorted during the subsequent procurement, the following measures should be taken into account:

- the publication of a Prior Information Notice (PIN) on the EU TED portal with a link to relevant information on a website serves to inform widely the desire for an innovative outcome and the methodology and rules of the market consultation, in compliance with the TFEU principles;
- the public procurer needs to pro-actively communicate its needs, requirements and its planned procurement set-up to all participants in the open market consultation (e.g. have a market sounding prospectus);
- the participation of a potential bidder in the open market consultation must not affect competition in any future tender procedure; any information which potential bidders receive during the open market consultation must be shared also with other potentially interested bidders via publication of questions and answers ('Q&A') docs after the open

³⁵ The poker planning technique is a debate moderation technique in which vendors are given cards with numbers on (like in the poker game) and they are asked to reply to different statements/questions from the procurer by holding up a card. The planning poker technique enables the procurer to verify with the market whether the assumptions of the business case were set realistically (e.g. feasibility of reaching the desired functionality/performance improvements within the planned time and budget, level of complexity of different solution approaches, required implementation effort and testing set-ups etc.). See eafip Toolkit Module 2 p.68-69.

³⁶ Rainville, A. (2016). "From Whence the Knowledge Came: Heterogeneity of Innovation Procurement across Europe." *Journal of Public Procurement* 16, no. 4 (Winter 2016): 463-504.

market consultation that are to be referred to within the tender documentation;

- legal assurances must be put in place that all participants' intellectual property rights (IPRs) and trade secrets will be protected, or that they will be entitled to due compensation in case of breach of confidentiality obligations by the public procurer. When public or private partners release confidential information to each other during an open market consultation, Non-Disclosure Agreements ('NDAs') often regulate how that information may be used. It is essential that public procurers are attuned to the necessities of trade secrets in addition to IPR.
- it is mandatory that potential bidders understand that the competitive phase of the public procurement procedure is conducted separately after the open market consultation and all potential bidders are treated equally; this statement should be included in any invitations to open discussions.

Several disclaimers could be included in the open market consultation documents. These disclaimers could regard to, for example, the participation to the market consultation, the separation of the market consultation step from the procurement itself, the dissemination of the market consultation results, the treatment of the information provided by the market etc.

Examples of disclaimers:

- By participating in this market consultation, you will not necessarily be included, nor excluded, from a future procurement. Also, the provided answers in this market consultation will not be used in to evaluate your future commercial proposals.
- As the questionnaire is intended to explore the supplier market 'as-is', there can be no wrong or right answers. The answers you will provide will be used as input for our procurement strategy, which we will try to align with the market place as good as possible.
- After the public procurer has processed the response of all suppliers, we will communicate the results widely. Our policy is that we will treat all provided supplier information as commercially sensitive and we will therefore not communicate any supplier specific details. Only the general findings will be communicated.
- We would like respondents to answer our questions as good as possible or indicate that the questions do not apply to your competences or line of business. Any suppliers can be added to the list or be removed from it at any point in time, at their request. The suppliers on the list will be visible to all others by viewing the mailing list, along with the questions.

Building trust with the market - the Trust Agent Model

An alternative open market consultation is the so-called Trust Agent Market consultation model (TAM model). The TAM model is a verified and confirmed market consultation model, developed by the CSR Organization in The Netherlands (MVO Nederland).

The TAM model entails a two-stage market consultation exercise:

1. A first step taking the form of a closed brainstorming session organized by an independent trust agent at the request of the public procurer(s) with sector-specific frontrunners in the market, followed by
2. The second step comprising the open market dialogue.

This approach is used to identify and specify the needs of the public procurer(s) and to stimulate innovative co-operation between public procurers and economic operators. It has proven to be a very successful model to bridge the gap of trust between the demand and supply side, and the gap between the needs of public procurers and what the market can offer.

The model distinguishes itself from the 'traditional' open market consultation in three different aspects:

- It makes use of an independent process facilitator, the so-called trust agent;
- It entails the covering of two steps: the closed brainstorming session(s) and the open market dialogue; and
- It is based on specific rules of engagement for both the demand and the supply sides.

The trust agent facilitates the process during the closed brainstorming sessions and the open market dialogue. The agent takes up different tasks, depending on the needs of the public procurer. These include identifying sector specific relevant front runner companies and experts, supporting the public procurer in formulating the relevant questions, and helping to develop and communicate the rules of engagement.

While the Trust Agent acts at the request of the public procurer, the agent should not be considered to work on behalf of the public procurer. The Trust Agent is an independent organization, whose main interest is to ensure high ambitions in the field of innovation and innovative co-operation. To this end, it is essential that the Trust Agent is trusted by both the public procurers and the economic operators. Its independent position can be guaranteed by selecting an independent, trusted organization; ensuring multiple sources of financing for the market consultation (not only by the public procurer); and ensuring that the Trust Agent does not take over the responsibilities of, or acts on behalf or in the name of, the public procurers.

An example of such Trust Agent is CSR Netherlands, the national center of expertise and business network organization for corporate social responsibility

In The Netherlands. CSR Netherlands constantly and increasingly cooperates with public procurers and private economic operators in order to stimulate innovation and sustainability. The TAM model has proven to be a successful model to achieve this goal.

5.4 Calculating and comparing value

The final step in the business case methodology is to summarize the information gathered in the previous steps in order to make a value-based decision on whether to proceed to the procurement stage, and if so which procedures to use and how to best structure the tender documentation. This will help ensure that the right solution is received at the right price. Calculating this value is most often done by using a Cost-Benefit Analysis (CBA), which highlights the strengths and weakness of various options. A CBA takes the form of a **Net Present Value (NPV)** calculation, which is the difference between the costs and benefits that occur at different points in the future, at the present time. For more accurate estimates, a discount factor is used to better reflect the time value of money, and opportunity costs of investment.

Costs for a PCP followed by a PPI will typically be higher than those for a stand-alone PPI, since by definition the activities of the former must include a degree of R&D, whether right from the conceptual phase (phase 1 of the PCP) or only proof of concept (phase 3 of the PCP). A procurer choosing for a PPI can do so due to greater technological and market certainty compared with projects requiring a PCP approach. This makes maximum costs lower than if R&D would also be purchased. Also of relevance to costs in a PCP is the division of the R&D budget, which can differ by number and timing of phases, number of suppliers, and the portion allocated to each supplier.

For innovation procurement in general, a large proportion of the **benefits** will come from the cost-savings from the new solution. For open data innovation procurement, these benefits are expected to occur further into the future and in an exponential amount in comparison to the costs, as the network effects of the procurement create secondary and tertiary benefits. Due to the benefits occurring over a number of months - and for a PCP, occurring at a point many months away from the time a given decision is made - the value of the benefits will heavily influence the **break-even time**, as the time in the future when the invested costs are equal to the benefits received. The **baseline** for comparison in calculating these benefits can be the previous solution, as identified during the needs identification and assessment. For open data procurement, the costs of the current lock-in situation can help form the baseline, and the benefits the cost savings achieved through the integration and wide availability of open data - both for subsequent suppliers' use of that data in delivering innovative solutions for future procurement, and for the public's direct (e.g. faster public service delivery) and indirect (e.g., cost reduction due to greater market competition) benefit.

Calculating the NPV by using this baseline allows the procurer to calculate the magnitude of potential savings for an updated solution. Once the NPV is

conducted, a **sensitivity analysis** can provide an indication of the degree to which the NPV is dependent upon the different inputs, including cash flows as well as discount factors. Other estimates of project profitability can be used alongside an NPV, to provide complementary information regarding the attractiveness of the project. Namely, these are **return on investment (ROI)** and the **internal rate of return (IRR)**. The ROI expresses how many additional euro are generated by a single euro invested in the procurement, whereas IRR reflects the difference in profitability when investing the money in an open data innovation procurement project versus in alternative activities.

5.5 Drafting the procurement documentation

With respect to how the information gained during the preparatory phase is used, the results of the business case methodology can provide sound insight into the value of a prospective solution or courses of action for procurers. Once the decision has been made to proceed to with the procurement, the information gathered can also be used in drafting call for tenders of the open data innovation procurement.

The procurement documentation creates an environment in which suppliers compete to provide innovative solutions for open data. In drafting procurement documentation, contracting authorities should strive for the end result to be open to as many appropriate suppliers as possible, while inviting a variety of different solutions which meet the need of the users, are compatible with installed bases and interchangeable with competing providers (i.e., based on open standards).

Results of the methodology can be carefully translated into a rigorous assessment framework in the procurement documentation, opening the procurement to more suppliers and solutions and bringing expected costs and benefits even more in line with procurers' preferences. For open data in particular, these actions are vital to ensuring consistency between a well-conducted business case methodology in the planning phase and the continuation into tender documentation.

Findings from information gathered as part of the business case methodology can be relevant to *technical specifications*, *award criteria*, and/or *contract clauses*. For example, including select identified standards in the **technical specifications** can help ensure that the solution proposed meets minimum requirements for openness, compatibility, quality, safety, environmental performance, etc. It is also important not to over specify, to support openness.

Regarding **award criteria**, procurers are encouraged to use the *Most Economically Advantageous Tender (MEAT)* to develop price-quality ratios, rather than awarding solely to the lowest offer. This supports the purchase of high-quality products and services optimally suited to their needs. In addition, for calculating costs, a *Total Cost of Ownership* approach, such as using *Life Cycle Costing*, is important. This is even more so for open data innovation procurement, where benefits of openness increase over the long term while initial costs may be

higher than for continuing business-as-usual. Translating the results of the user needs assessment, for example, through scoring and ranking exercises can help reward suppliers with the best solution.

For **contract clauses**, the *break-even time* (as calculated using the business case methodology) can be used to determine the desired minimum time for the project. In addition, a cycle of monitoring and performance assessment based on the *Key Performance Indicators (KPIs)*, *milestones*, *benchmarks* and *value engineering* can be applied to PCP or PPI contracts. Monitoring can be reflected in periodic performance reports according to milestones established in the contract, in combination with a requirement of value engineering that creates an incentive to the supplier to find alternatives to improve the initial KPIs and benchmarks as identified in the planning phase. In this model, the supplier could be required by a contract clause to present an improvement proposal in a given period of time depending on the contractual terms (e.g. once every year), to be evaluated for acceptance by the public procurer. The accepted improvement proposal is therefore implemented, adding value in comparison with the original business case estimates. The goal of value engineering is to lower the *life cycle cost* and improve *return on investment*, with a focus on function analysis and function worth. It presents an innovative way for contracting authorities - including local governments - to interact with suppliers to create further cost savings through service innovation.

6 Best practices of open data innovation procurement

This section identifies and describes use cases of open data innovation procurement, with particular focus to such procurement by municipalities and regional authorities. The following attributes are discussed, when available: The problem at hand and objective of the project (particularly with respect to open data), the process used to plan for (e.g., the business case methodology) and conduct (e.g., procurement mechanism PCP or PPI) the procurement, benefits and challenges experienced and predicted, any mitigating measures taken, the value and lot characteristics, and the firm characteristics of the awardee (e.g., whether they were an SME).

The collection of use cases has been done through a survey in the form of a questionnaire, created by the joint effort of Agoria, Corvers and Vtrek, that selected the most suitable themes of investigation. The survey was then sent to 50 public contract authorities throughout Europe. The mentioned contract authorities were identified mainly through the Tenders Electronic Daily (TED), the European public procurement journal, focusing on those procurements that had the use of open data as main object. In addition, the questionnaire was also sent to public authorities with whom Vtrek/Corvers have worked in the past. The questionnaire focused on elements related to the policy and legislation in which the procurements took place, motivations for including open data, strategies and results for informing the business case of the project, and (if applicable) the characteristics of the procurement in terms of contract size, and of the winning supplier.

A total of nine survey responses were received. Three public authorities were able to provide full responses to the survey, given that their projects were directly related to open data procurement and had already been completed. These authorities were Energy Systems Catapult (UK), Centro Municipal de Empresas de Gjion (Spain), and the City of Namur (Belgium). Two responses were not included because they were not compliant with the subject matter of the survey. Concerning the additional responses, one public authority replied that the project had not as a main object the procurement of open data solution, and this response was therefore not fully examined. An additional three respondents said that their projects are still ongoing or in the planning phase. Follow-up emails were sent to respondents with a number of clarifying questions, and their responses subsequently included in the discussion below.

To supplement this sample, a number of additional cases of open data procurement were also included. These were the project *Infoshare* by the city of Helsinki, the *Dike Data Service Center* and *Central Distribution Layer* by Het Waterschapshuis, and a number of ongoing projects. Additional efforts to identify relevant examples were also taken, such as direct contact with a few cases of potential relevance via telephone.

Focusing on those best practices which are most applicable to open data procurement by local governments, the following sub-sections present an overview of the cases where unique insights can be gleaned for public procurers seeking to conduct similar innovation procurements. Where particular information was

available, such as on challenges or particular aspects of open data, specific attention is given to highlight its relevance to the study. A summary table for each of these use cases is presented in Annex 1, according to type of and approach to open data innovation procurement.

6.1 Energy System Catapult (UK): Smart heating system monitoring system

About of the buyer: The Catapult Centres are organisations set up in 2011 by Innovate UK (a non-departmental public body operating in the name of the Department for Business, Energy and Industrial Strategy) as body governed by public law. The goal of this centre is to promote research and development in the United Kingdom through business-led collaboration between scientists and engineers to exploit market opportunities.

Background and description of the procurement: The procurement was for surveying and Installation and maintenance of a smart heating system monitoring system (HESG System). In particular, it was the phase 2 of a larger project called "Smart Systems and Heat (SSH) Programme" that aims at providing future-proof and economic local heating solutions for the UK, with particular regards to decarbonization. The market consultation was performed in the phase 1 of this project by a consulting company who engaged with various manufacturers and industry experts. In addition, some of the core suppliers were consulted and were used to assist in the ongoing development.

Given the public nature of the project, Catapult had to participate in extra market engagement through dialogue with local authorities and some of their supply chain. In addition, some of the core suppliers had to be consulted to assist the procurer in the development.

An important constrain regarded the open data management. In this case, the procurer realized that the open source hard and soft components had to be regularly updated. A similar issue applied to the software, which requires certain amendments to allow for upgrades.

Financing: £ 300,000 - funded by the Department for Business, Energy and Industrial Strategy and Catapult's core grant.

Procurement method: off-the-shelf procurement, with an open procedure (work contract).

6.2 Gijon Impulsa Empresas (Spain): Intelligent data analysis tool

About the buyer: Gijon Impulsa Empresas is a public enterprise owed by the Gijon City Council in order to facilitate the generation, development and consolidation of business initiatives that contribute to the creation of stable employment and well-being in the city of Gijon in Spain.

Background and description of the procurement: the object of the procurement was the development of an Intelligent Data Analysis Tool (HAID IMPULSA) to serve

the needs of the area of economic and business promotion of the City of Gijón. This tool would prepare and homogenise, extract and analyse large amounts of sectorial and economic information obtained from multiple sources of both structured (databases, spreadsheets, open databases) and unstructured information (reports, records in text format, html). This ICT solution should be interoperable to facilitate the reuse of the captured and treated information, and should respond to at least the Key Performance Indicators included in the Gijón City Social Agreement³⁷: "Agreement for growth, diversification of economic activity, the promotion of talent and the improvement of employability in a framework of social cohesion" (Gijón grows, 2016-2019).

The tool will be based on a Big Open Data Platform within a high-available and scalable architecture. It will allow accessing to relational and non-relational databases, by integrating open data sources through an automatic mapping tool capable of defining the origin and destination of this open data.

Some of the main features of the tool include:

- Specific procedures for the quality improvement, exploitation and pre-processing of the open data.
- The analysis of unstructured open data such as reports, records in electronic format, or social networks, without using a programming language by final users.
- Supervised and unsupervised machine learning algorithms, as well as predictive models and pattern recognition algorithms for the automatic identification of groups and communities based on captured open data.
- Interface to configure and retrain all models and algorithms without using a programming language.

Procurement method: Public Procurement of Innovation - PPI

Budget: € 200,000

The procurement currently remains to be finalized

³⁷ The City Council of Gijón and the main socio-economic agents of the city, the Asturian Federation of Entrepreneurs and the Regional Labour Unions signed in mid-2016 a Social Agreement with the purpose to boost both the growth of the city of Gijón and the local talent through an integral set of programs. The Agreement 'Gijon Crece' establishes 6 axes: (1) strategic sectors; (2) enabling sectors; (3) specialized sectors; (4) infrastructures, services and incentives; (5) talent and employment, and (6) social responsibility. The Agreement indicates for each sector and program expected results and indicators.

http://empleo.gijon.es/multimedia_objects/download?object_id=205502&object_type=document

6.3 Department of Mobility and Public Works (Belgium): Digital Elevation Models

About of the buyer: The Flemish Department of Mobility and Public Works supports the Ministry in its policy concerning mobility and traffic safety, as well as investment, management and operation of the transportation and port infrastructure in Flanders.

Background and description of the procurement: Digital Elevation Models (DEMs) are used in a wide range of applications such as nautical charts, dredging operations, morphological analysis and habitat maps. In coastal areas, where land and water meet, the elevation of the earth's surface cannot be measured with a single technique. The depth of the seafloor is measured using echosounding from a waterborne platform. In Flanders, 5-6 vessels are used to fulfil the demand on seafloor elevation. At the same time the height on land is acquired using airborne laser-scanning. Merging of data from these different sources is needed to produce seamless Digital Elevation Models (DEMs) in coastal and estuarine areas.

However, the current practice has some limitations. Survey areas are limited by what is feasible within a single survey day. Consequently, large areas need multiple survey days (up to weeks) with eventually multiple survey vessels, and certain areas have a low revisit frequency (up to multiple years). It is clear that these activities are costly and labour intensive. Even more effort is needed to adequately cover the intertidal part of coastal areas. Bathymetric surveys need to be scheduled at high water, resulting in slower acquisition rates. Laser-scanning surveys need optimal weather conditions and need to be scheduled at low water. Combining both survey results into a single map covering the area of interest is complex and adds to the costs of data acquisition.

Technological developments in different but related areas (space and airborne techniques, novel acquisition platforms and advancements in signal processing) are expected, but may only deliver partial solutions or require important R&D investments on the long term.

Thus, the goal is to design and develop an innovative technique to produce a DEM of entire coastal areas integrating (existing) multi-sensor data and making use of advanced signal processing methods. This is an ambitious goal aiming at a breakthrough innovation. It will be necessary to reinvent the survey strategy and to develop novel processing techniques.

The procurement currently remains is to be finalized.

Procurement method: Pre-Commercial Procurement - PCP

6.4 Helsinki Region (Finland): Helsinki Region Infoshare (HRI)

About the buyer: the Helsinki Region is the administrative body of the so-called Greater Helsinki, the metropolitan area including the smaller Capital

Region (Helsinki) and the commuter towns surrounding (Espoo, Vantaa and Kauniainen).

Background and description of the procurement: in 2010, the cities of the Helsinki Region began sharing public data for anyone to use freely. These open datasets, available through the web platform [Helsinki Region Infoshare \(HRI\)](#), make it possible for citizens to develop applications based on these, and follow the public decision making. The decision to open up public data was driven by a desire to expand the interaction with citizens and improve the quality of public services. The platform includes information on more than 600 different datasets, including data on public transport, public decision making, public service points, maps, statistics and, more recently, detailed statistical data on schools, wellbeing and social services, historical maps, and aerial photos. The [HRI technical description](#)³⁸ and an [app gallery](#)³⁹ is available online.

An example of an app developed using HRI data is *Ahjo Explorer*, which gives access to all the public decisions concerning the city of Helsinki right to your Windows phone. Another is *Blindsquare*, designed to help blind people navigate the city. Other apps have been designed around public transport and services for tourists, amongst others. These apps make using public services easier and more accessible for citizens, improving quality of life and satisfaction and creating new businesses and jobs.

HRI has published a [guidebook](#)⁴⁰ called *Helsinki Region Infoshare, 2 years of open public data*, which explain the genesis of the HRI and the emergence of the open data phenomenon in Finland. This is an example of communication and dissemination activities which municipalities who have successfully conducted open data procurements can use to share learnings with others and also supporting them to take up similar approaches.

Procurement method: Public Procurement of Innovation - PPI

Financing: HRI was developed by the four cities within the greater Helsinki region, in collaboration with the Forum Virium Helsinki and SITRA (the Finnish innovation fund) and with financial support from the Finnish Ministry of finance. The start-up phase cost around €820,000 while the 2013 budget was €270,000. When the project enters the maintenance phase, it is expected to cost around €60,000 a year. Development projects will be financed separately.

³⁸

https://www.hel.fi/hel2/tietokeskus/data/dokumentit/HRI_Technical_Description_20150227.pdf

³⁹ <https://hri.fi/data/showcase>

⁴⁰ <https://hri.fi/2years/>

6.5 Het Waterschapshuis (Netherlands): Dike Data Service Center

About the buyer: The Water Board Netherlands (Het Waterschapshuis) is the management and implementation organization in the field of digital information provision for the water boards in the Netherlands. Twenty-one of the regional water authorities have founded a partnership called Het Waterschapshuis. This partnership is a legal entity, owned by the regional water-authorities. Het Waterschapshuis is founded exclusively for the procurement and contract management of the collective ICT-systems for the participating water authorities.

Background and description of the procurement: Het Waterschapshuis initiated the procurement *Dike Data Service Center* together with the Stichting IJKdijk, a Dutch company specialized in sensor technology for water management and safety. In this procurement the market was asked to deliver an open source platform able to combine different data sources and to store and use the collected information for the assent management of water barriers. The winner of the procurement was selected entirely on the offered quality. Het Waterschapshuis set a maximum price and listed minimum and optional functional requirements. The winner, a joint venture of two SMEs (Nelen en Schuurmans and Fugro) delivered a solution based on which the Dutch water boards can prioritize more easily their works and can enhance the level of water safety greatly.

Procurement method: Public Procurement of Innovation - PPI

6.6 Het Waterschapshuis (Netherlands): Central Distribution Layer - CDL

Background and description of the procurement⁴¹: Het Waterschapshuis needed to create a bridge between individual regional water authorities and the Dutch National Spatial Data Infrastructure (SDI)⁴² with a simple and cost-effective means of fulfilling their INSPIRE and Open Data obligation with a single ICT solution and make the same data available through a single (set of) channel(s) to the end-user or added value provider. The objective of the procurement was to achieve nationwide harvesting and servicing of data relevant to the EU

⁴¹For more information on the improvement of the innovation procurement see:

<https://www.hetwaterschapshuis.nl/pagina/producten/kennis-en-verbinden/activiteiten/activiteiten-kennisdelen-en-verbinden.html>

⁴²The Dutch National SDI (PDOK) is a central facility for unlocking geodatasets of national importance. This is actual and reliable information for both the public and private sectors. PDOK makes digital geospatial data available as data services and files. Most PDOK services are based on open data and are therefore available to everyone. The PDOK services meet national and international standards, including the European [INSPIRE](#) standards and the Dutch e-government standards.

<https://www.pdok.nl/en/about-pdok>

INSPIRE Directive (2007/2/EC) and other Open Geo Data provided by all regional water boards (Waterschappen) in The Netherlands.

The project sought to procure a combination of proven (Internet) technologies, and use of new standards for data definition and storage. More specifically, it required water infrastructure related geo-data (water system data model "DAMO") combined with newly developed xml-scheme for data exchange (as part of the Dutch Informatie Model Water "IMWA" standard) for seamless and virtual real time harvesting of data from all 23 water boards.

The Dutch national Spatial Data Infrastructure (Publieke Dienstverlening op de Kaart "PDOK") served as the front end for the solution. PDOK makes digital geospatial data available as data services and files according to both national e-government (Infrastructure for Spatial Information in the European Community - IMWA, Basisregistratie Grootchalige Topografie - BGT, Geography Markup Language - GML) and international (Inspire Web Map Service - WMS / Web Feature Service - WFS) standards. Most PDOK services are based on open data and are therefore available to everyone.

A business case methodology was used to define key performance indicators (KPIs) such as hour savings with a new data management ICT solution. It is estimated that 23 water authorities invest 1,500 hours per year in data management. The hour cost is estimated at € 80. The new solution would reduce the hours by 50%. The innovation procured (CDL solution) reduced the time of data management from 1,500 hours to 750 hours per year. It is estimated that the Dutch water authorities save € 1,380,000 per year with the new ICT solution.

Type of innovation procurement: Public Procurement of Innovative Solutions - PPI

Financing: € 1,000,000

Challenges and learnings: The procurer considered that the most important change in the project approach was a change in the tender procedure, to a restricted procedure. With this change, the transaction costs for both Het Waterschapshuis and the market were reduced substantially. There were 10 prospective suppliers, and after the selection phase five companies remained. The procurer outlined other improvements implemented in the contract, including guarantee clauses, elements related to the terms and conditions, and specially enhancement of the clauses on price and deliverables. The quality of the contract was brought to a higher level and therewith a higher chance of a successful performance after tendering. The contract was tendered in the summer of 2016, and Geodan (an SME with 170 employees) was selected to implement the CDL. A Proof of Concept was first made for the water boards to agree upon, and from the beginning of 2017, the water boards could connect to the CDL.

Het Waterschapshuis considers that the most important learning was to improve the quality of the business cases. Not specifically on the technical input, but on the (lack) of input of economical and procurement knowledge. As a result of this recommendation, the internal process to create a business case was changed. A second important recommendation was to make sure that the project team is

willing and able to create their own 'critical look', their own 'critical sound'.

"It is impossible to create a business case and develop a specific tender procedure on your own and in one try. If that happens, you must be alarmed. The project team must organise their own 'quality assurance'. This is a matter of attitude and behaviour. As the management of the team of an organisation, you should facilitate this."

6.7 Belfast City Council (UK): Data analytics boosting rate revenue

About the buyer: the Belfast city Council is the administrative body of the city of Belfast in Northern Ireland.

Background and description of the procurement: Belfast City Council desired to reduce the level of uncollected business rates in the city.⁴³ For this purpose, it was decided to assess the potential for data analytics, mining existing public sector data to identify businesses escaping rate payments or paying lower rates than appropriate.

The council is now exploring options for procuring a full-blown solution. As such, the procurement is to be finalized.

Procurement method: Pre-Commercial Procurement - PCP

Financing: Together with Innovate UK, the Department of Finance and the Future Cities Catapult, the City Council set up a PCP with a budget of £130,000. For phase 1, awards of £5,000 each were made for proofs of concept. Two companies proceeded to phase two were awarded £55,000 for prototypes, including two weeks of field testing which immediately identified significant additional revenue opportunities. These companies were Belfast's Analytics Engines and Southampton's NQuiring Minds - both SMEs. Each has received a contract to build working prototypes of their proposal.

6.8 Water Board Limburg (Netherlands): Maintenance prediction model

About the buyer: As a subsidiary of Waterschap Limburg, Waterschapsbedrijf Limburg's ('WBL'; Water Board Limburg) mission is to produce purified wastewater and converts sewage sludge into valuable raw materials and energy.

Background and Description of the procurement: WBL has tested a monitoring and prediction model based on the data provided by sensors in 7 waste water pumps. By comparing the real-time sensor data with the pumps' design specifications, the developed software could analyse the functioning of the pumps (e.g. volume

⁴³ Business rates (also called non-domestic rates) are a tax on non-domestic properties to help pay for local council services.

of waste water being pumped), could predict need for maintenance and could quickly identify leakages. Therefore, the objective is to enable the mining of big-data from the systems which have already been implemented.

An innovation procurement is currently being planned for a new technology for the systems across Limburg which will process this data.

Procurement methods: Public Procurement of Innovation - PPI

The procurement is currently in the planning phase.

6.9 City of Namur (Belgium): Design and implementation of an Intelligent Transport System (Système de Transport Intelligent - STI)

About the buyer: The City of Namur is a Belgian municipality of 110,000 habitants. It is the capital of the Walloon Region (Wallonia) and the capital of the Province of Namur.

Background and description of the procurement: The Intelligent Transport System is a tool aimed at meeting three main objectives: the real-time dissemination of mobility information, the development of a mobility strategy and the consideration of sustainable development.

A number of devices will be installed on the main roads to collect traffic data (e.g. cameras for automatic recognition of license plates, counting loops, sensors) and broadcasting equipment information (e.g. variable message signs, information terminals for commuter, etc.). These devices will be embedded in a central system where the collected information will be stored and can be recovered for various purposes in favour of the life quality enhancement of the city. In addition, the system would be also able to gather the data generated from existing sources, both public and private: works, car parks, bike or car sharing etc.

In order to acquire the best possible solution, the City of Namur had to involve the main public stakeholders in the discussion for the definition of the specifications of the solution, among which the police, the public transport company, PEREX (the traffic centre of the Walloon Region), and regional road companies. In the following stage, the City, supported by an external consulting company, held a one-day market consultation where the needs of the city were presented in front of an audience of providers, that were also invited to present their services and solutions. The information gathered during the market consultation supported the City in refining its requirements.

The contract will be awarded at the end of 2018, beginning of 2019 (procurement to be finalized). Being a service contract, the service should be delivered by the contractor. Nevertheless, given the complex nature of the service, the City will engage the prospective contractor in a 3-month-study phase in order to better define the features of the final solution.

Financing: € 3,000,000 - This project is part of the Namur Innovative City Lab, a portfolio of 11 projects, developed by the City of Namur, with the support of

the Economic Office of the Namur Province (BEP - Bureau Economique de la Province de Namur) as a leader, as part of the programming of the ERDF European Funds 2014-2020.

Procurement method: off-the-shelf procurement, with an open procedure (service contract).

7 Coordinated or joint cross-border procurement

While open data public procurement can be conducted by a single contracting authority, joining forces to plan for and procure together with multiple authorities can immediately improve the 'openness' of the resulting solution, by increasing its ability to be integrated into multiple types of systems. If this is done with contracting authorities from other countries in the buyers' group (i.e., cross-border), international integration and interoperability is additionally supported. However, due to this, such procurement comes with particular challenges which must be sufficiently tackled during the planning stage in order for the benefits to be reaped. These challenges can be legal and economic in nature.

This section provides an overview of the legal aspects relevant to joint cross-border procurement, as well as the current practice, highlighting the benefits, persisting challenges and lessons learnt by previous projects. As well, there is legal flexibility embedded in the EU public procurement rules for the deployment of joint cross-border procurement practical experience.⁴⁴

Joint / coordinated procurement entails the combining of procurement actions of two or more public procurers from the same or from different countries. Joint / coordinated transnational procurement is when two or more public procurers from different countries combine procurement actions.

- **Coordinated procurement:** several procurers carry out together the preparation but not the execution of the procurement procedure. Procurers define common requirements together and consult the market together on available solutions, but launch separate procurement procedures to buy separately the amount of products they each individually need.
- **Joint procurement:** several procurers carry out together not only the preparation but also the execution of the procurement procedure. Compared to coordinated procurement, there is only one joint procurement procedure launched.

7.1 Benefits of coordinated or joint cross-border procurement

Coordinated, and even more joint procurement, brings substantial benefits to public procurers. Firstly, it helps deliver better value for money solutions - the buying power is greater than the purchasing power of individual procurers, which can enable economic operators to deliver better value for money solutions (e.g. economies of scale of production because of the larger potential market / higher value contracts). This is thus particularly interesting when the identified need is likely to be faced also by other procurers at

⁴⁴ This is supported in the EU procurement directives; see Article 39 in Directive 2014/24/EU.

local/regional/national or European level and when the market for the solutions is very fragmented (joint signal from demand side is needed).

The following are key benefits of coordinated or joint cross-border procurement:

- **Reduce costs for preparing and/or carrying** out the procurement (administrative costs to prepare the procurement, run the procedure and the non-administrative costs e.g. costs for the testing and acquisition of solutions) can be substantially reduced / split among the participating procurers. In particular joint procurement can thus enable procurers to tackle needs for which individual procurers lack sufficient financial resources to procure alone;
- **Link skills and expertise;** the participating procurers share knowledge, expertise and skills; for example, one of the procurers could bring significant economic expertise, while another could provide extensive legal expertise or expertise in undertaking innovation procurements; This enables procurers to learn on innovation procurement from other more experienced procurers.
- **Foster standardization:** joint / coordinated procurement (agreeing on joint requirements for solving common problems) can foster the creation of de facto and de jure standards and increase interoperability between the systems of participating public procurers; This is thus particularly interesting when coherence, interoperability, inter-exchangeability or interconnectivity is required.
- **Enhances cohesion and cooperation:** on public sector challenges across borders. By fostering cooperation between procurers and suppliers from more and less developed regions in Europe on common challenges (e.g. environmental protection, economic growth, fighting climate change etc.).

7.2 Challenges of coordinated or joint cross-border procurement

A number of challenges have been identified which are common to many cross-border joint procurement projects. These include the following, with mitigation measures mentioned where appropriate:

- **Language and additional translation requirements;** if members of the buyers' group come from countries where different languages are spoken. While it can be advisable to publish procurement documentation in English, so as to reach a wide audience of potential suppliers, procurers may decide to publish additionally in their own languages to ensure that local suppliers are also engaged. This may become more relevant to municipalities, who are interested in stimulating the local economy while still attracting innovative ideas from talented companies.
- **Additional time required for the planning phase;** and namely for moving through the business case methodology. The use cases can vary widely between members of the buyers' group, making the first step of needs

identification difficult but also increasingly important to project success. Agreeing on common needs is therefore critical, and extra time and effort must be devoted to support this more thorough process. Hosting user needs identification workshops on-location of the different members of the buyers' group - and if necessary with translation services - can facilitate information exchange and agreement on a common need.

- **Differences in installed bases and national champions** Related to the technical requirements, a primary source for challenges are the differences in the existing technologies which each partner has as its 'installed base' - and for open data, often from application to the network level must be considered to ensure that whatever solution is procured will be able to operate with the systems of the various buyers and under the different circumstances in which their particular users will use the solution. In addition to national differences in open standards (e.g., the M-Bus standard for the remote reading of gas or electricity meters can have various additional national specifications for radio frequencies), national economic interests in the form of supporting national champions and domestic suppliers can deter contracting authorities from abroad from wanting to join the buyers' group.
- **Difficulty forming the buyers' group:** Hesitation by potential members of the buyers' group makes identifying and communicating potential benefits of joint procurement - and especially with respect to open data - critical by the lead procurer. These benefits can come in the form of a business case which is underpinned by economic evaluation the value which a new common solution based on open data brings to each of the purchasing parties, both in the short and in the long term. The latter is especially the case if significant investment into systems and networks must be made to facilitate future (joint) use of open data which is to be collected on a particular platform.
- **Enhanced need for leadership:** Due to the additional administrative burden which a joint procurement can entail, there will be an enhanced need for leadership, coordination, cooperation in such initiatives. Notably, these activities can be performed by the party who is best suited for the task. For example, the project lead does not necessarily have to be the lead procurer - where the former could have a larger staff and capacity for drafting the tender documentation and carrying out the official duties for the procurement, the latter may have more experience in coordination activities. When the buyers' group is being formed, the strengths and capabilities of each party should be discussed in order to assign complementary roles which can help further the project.
- **Legal aspects** which may deter parties from pursuing a joint procurement relate to applicable law, jurisdiction, administration, and relation of national and EU law. However, there may also exist legal drivers which promote this activity, such as the EU public procurement rules. This is detailed in the following section.

8 Conclusions and recommendations

Whether in the form of PCP or PPI, innovation procurement accelerates the modernization of public services and is a unique tool to drive development of open data-related solutions. In conducting innovation procurement, municipalities are uniquely advantaged by the local nature of data and their connection to users, features which they can capitalize upon in their open data procurements. Similarly, coordinated or joint cross-border procurement holds strong potential to increase the 'openness' of solutions procured by a single municipality and create exponential long-term benefits, with opportunities for learning effects and capacity building from knowledge sharing. Opportunities for industry of procuring in such a manner include stimulating the competitiveness of SMEs by offering them opportunities to innovate around open data, providing meaningful products and services for which the public benefits (either directly or indirectly). Including open data in procurement approaches is pivotal to long-term system integration and interoperability as it can break lock-in to a particular technology/service or supplier. Despite these benefits, we see that municipalities have not taken up open data procurement (including using joint cross-border approaches) to its full extent, meaning that efforts must be taken to facilitate movements from policy implementation to project planning and execution. Once more projects have been planned and executed, the additional data that this provides will allow for further study of the methods and benefits of open data innovation procurements, particularly by municipalities.

The findings of the use case assessment and analysis for this report, combined with previous experience of the contracted suppliers Corvers/Vtrek, suggest that two different **approaches** to open data procurement can be surmised. The first of these is the **public procurement of an ICT network or system**, such as is seen in the case of Gijon, where the procurement of a hardware product (in the case of a centralized physical database facility) or software hosting system, (such as cloud services) is the first step. This is since providing the possibilities for open data generation and storage is a necessary prerequisite for enabling the use of that data by future suppliers. The latter serves as the second approach to open data procurement, where contracting authorities procure **solutions from suppliers** which they have already (in the case of PPI) or plan to (in the case of PCP) develop, such as in the case of Water Board Limburg. These solutions must be compatible with the installed network or system, and would use open data in a way that creates meaningful value to the end-user, be that public servants or the public itself.

In conclusion, the current state of open data innovation procurement in the public administration is still at a preliminary stage, namely at the level of purchasing systems which simply enable open data services. It therefore becomes the responsibility of project managers, procurers, and policy makers to ensure that the initial intentions, which served as an explicit driver for the openness of the data, follow through to subsequent procurement projects, such that subsequent applications which depend on the open data platform or use of its data, for example, are also sufficiently open. This will support fair

competition in the market place, in particular by fostering the SMEs' participation in the (new) markets and, at the same time, it will strengthen the European competitiveness of the best open data products and services.

In other words, solid policies that stimulate the development and use of open data are a necessary driver to boost the economic and end-user benefits derived from an effective innovation procurement.

9 Annexes

9.1 Annex 1 - Use cases according to type of open data innovation procurement

In this section, a summary of use cases is provided, according to types of open data innovation procurement which were developed partly on the basis of use cases and desk research conducted as a part of this project. Using the aforementioned mechanisms, a number of different approaches to open data innovation procurement exist. Namely, these are either services to enable for the collection of open data, such as platforms or catalogues, and services using existing open data. The latter consists of direct services to citizens as end-users, to citizens through contracting authorities, or for contracting authorities themselves. The former consists of procurement of open data platforms and of digital layers, referred to as INSPIRE spatial/geo open data.

For INSPIRE spatial/geo open data, it is possible to procure solutions to collect and categorize open data in 34 categories. The availability of open data -and specifically spatial data- in itself is a service both to CAs and third parties/citizens. The other possibility is to procure solutions that use the available and categorized open data for specific purposes which could be both for the use of CAs or for the use of third parties/citizens (directly or through the CAS, some services could be developed without procurement, like free apps made by programmers).

"INSPIRE Network Services specify common interfaces for web services (discovery services, view services, download services, transformation services, services allowing spatial data services to be invoked). Based on these common interfaces, generic client applications can be developed that allow users to search for INSPIRE data sets, to download them or to visualise them in interactive maps. Network services and spatial data services are accessed by applications and geoportals via the INSPIRE services bus."

The Infrastructure for Spatial Information in the European Community (INSPIRE) has to comply with specific regulations on the interoperability of spatial data⁴⁵ According to Article 5(1) of INSPIRE Directive 2007/2/EC, Member States shall ensure that metadata are created for the spatial data sets and services corresponding to specific themes and that those metadata are kept up to date. The procurement of a solution for the collection of spatial data is a service to a CA, and the data can be used to provide services.

⁴⁵ For example, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32011R0102&from=EN> <https://inspire.ec.europa.eu/inspire-roadmap/61>

Table 1 - Classification of the identified use cases according to types of open data innovation procurement

| | | Type of open data innovation procurement | | | | |
|--|---------------------|---|---|---|---|--|
| | | SERVICES TO (ENABLE FOR THE) COLLECT(ION) OF OPEN DATA (PLATFORMS/CATALOGS) | | SERVICES USING EXISTING OPEN DATA | | |
| Case study | Type of procurement | Open data platforms | Digital layers - INSPIRE spatial/geo open data 34 themes | Direct services to citizens | Services to citizens through CA | Services for CA |
| 6.1 Energy System Catapult (UK): Smart heating system monitoring system | Off-the-shelf | | | | Smart Heating systems allowing for future-proof and economic local heating solutions for the UK | |
| 6.2 Gijon Impulsa Empresas (Spain): Intelligent Data Analysis Tool | PPI | | | Intelligent data analysis tool. Big data analytics to generate information for citizens, companies and policy makers. | | |
| 6.3 Flemish Department of Mobility and Public Works (Belgium): Digital Elevation Models - DEMs | PPI | | | | | 3-4D modelling /acquisition of data from sensors |
| 6.4 Helsinki Region (Finland): Helsinki Region Infoshare (HRI) | PPI | Open datasets, available through the web platform Helsinki Region Infoshare (www.hri.fi) | | | | |
| 6.5 Het Waterschapshuis (Netherlands): Dike Data Service Center | PPI | Open source platform to combine different data sources and to store and use information for the assent management of water barriers | | | | Solution based on which the Dutch water boards can prioritize more easily their works and can enhance the level of water safety |
| 6.6 Het Waterschapshuis (Netherlands): Central Distribution Layer – CDL | | | Achieve nationwide harvesting and servicing of data relevant to the EU INSPIRE Directive (2007/2/EC) and other Open Geo Data provided by all regional water boards (Waterschappen) in The Netherlands | | | |
| 6.7 Belfast City Council (UK): Data analytics boosting rate revenue | PCP | | | | | Data analytics, mining existing public sector data to identify businesses escaping rate payments or paying lower rates than appropriate |
| 6.8 Water Board Limburg (Netherlands): Pilot of big data analysis – maintenance prediction model | PPI | | | | | Big data analysis -maintenance prediction models. Monitoring and prediction model based on the data provided by sensors in 7 waste water pumps |
| 6.9 City of Namur (Belgium) - Système de Transport Intelligent | Off-the-shelf | | | | An Intelligent System based on a number of remote devices aimed at reducing traffic and enhancing of mobility | |

9.2 Annex 2 - Considerations for the personal data

Personal data is any information related to a natural person or 'Data Subject', that can be used to directly or indirectly identify the person. It can be anything from a name, a photo, an email address, bank details, posts on social networking websites, medical information, or a computer IP address.

The EU [General Data Protection Regulation \(GDPR\)](#) ⁴⁶ is the most important change in data privacy regulation in 20 years. The GDPR is to protect all EU citizens from privacy and data breaches in an increasingly data-driven world. The GDPR applies to all companies processing the personal data of data subjects residing in the Union, regardless of the company's location. The GDPR will apply to the processing of personal data by controllers and processors in the EU, regardless of whether the processing takes place in the EU or not. The GDPR will also apply to the processing of personal data of data subjects in the EU by a controller or processor not established in the EU, where the activities relate to: offering goods or services to EU citizens (irrespective of whether payment is required) and the monitoring of behaviour that takes place within the EU. Non-EU businesses processing the data of EU citizens will also have to appoint a representative in the EU. Under GDPR organizations in breach of GDPR can be fined up to 4% of annual global turnover or €20 Million (whichever is greater).⁴⁷

The data subject rights under GDPR are:

- **Breach notification:** when data breach is likely to result in a risk for the rights and freedoms of individuals".
- **Right to access:** the right for data subjects to obtain from the data controller confirmation as to whether or not personal data concerning them is being processed, where and for what purpose.
- **Right to be forgotten:** entitles the data subject to have the data controller erase his/her personal data, cease further dissemination of the data, and potentially have third parties halt processing of the data.
- **Data portability:** the right for a data subject to receive the personal data concerning them, which they have previously provided in a 'commonly use and machine readable format' and have the right to transmit that data to another controller.
- **Privacy by design:** calls for the inclusion of data protection from the onset of the designing of systems, rather than an addition.

⁴⁶ <https://www.eugdpr.org/>

⁴⁷ <https://www.eugdpr.org/key-changes.html>

- **Data protection officers:** DPO appointment will be mandatory only for those controllers and processors whose core activities consist of processing operations which require regular and systematic monitoring of data subjects on a large scale or of special categories of data or data relating to criminal convictions and offences.

9.3 Annex 3 - Open market consultation document (template example)

Open market consultation document

{Name of the project}

1. Introduction

[Include for example: the public procurer(s) initiating the project; the background and scope of the project and the main challenges/ambitions; the objectives of the market consultation; the scope of the market consultation and how it is envisaged to be organized]

2. The public procurer

[Include more in depth information about the public procurer and its mandate in relation to the tasks of the public procurement and the project]

3. Background

[Include information about the background situation, justifying and/or grounding the commencement of the project]

4. The project

[Include detailed information about the project and the sought solutions, in terms of functional outcomes: i.e., flexibility, cost effectiveness etc.]

5. The market consultation

[Include a detailed process description about the market consultation exercise: i.e., what form it will take, when and where it will be organized, what is the process to be followed, what is the objective thereof, whether it will consist of one or more rounds, how will the results be interpreted etc.]

6. Other documents attached to the PIN and market consultation document

[Include links to information]

7. Disclaimers

[Several disclaimers could be included in the market consultation document. These disclaimers could regard, for example, the participation to the market consultation, the separation of the market consultation step from the procurement itself, the dissemination of the market consultation results, the treatment of the information provided by the market etc.]