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DEVELOPING CAPABILITY TO SECURE SUSTAINABLE INFRASTRUCTURE



PBI Foundation

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FOREWORD

This report is a continuation of the process of increasing the capability in Finland to conduct selected infrastructure projects with alternative financing and delivery models¹. It further builds upon our previously published reports² on the subject.

Our aim is to provide an overview of capabilities needed by Finnish infrastructure companies, that have the ambition to participate in procurement processes for large-scale infrastructure projects. The focus has been on the procurement processes for alternative delivery and financing models. The other main aim is to provide an overview of governance models and policies for selected countries with a long tradition of utilizing alternative models. Attention has been to identify what incentive mechanisms are used by the procuring agencies to drive reduced carbon emissions throughout the lifecycle of infrastructure assets.

Our goal is to help both the private and public sectors in Finland to further develop capabilities and national level market maturity, to use alternative delivery and financing models for a selected part of infrastructure projects where private involvement brings added value to society.

This report is targeted towards both the private and public sectors in Finland involved in identifying, evaluating and delivering infrastructure using alternative delivery and financing models. The key target groups are:

- Construction companies in the Finnish infrastructure industry.
- Public sector actors responsible for selecting, evaluating and executing procurement strategies as well as managing Finland's transport infrastructure assets in line with the country's National Transport System Plan for 2021-2032. The key public actors are the Ministry of Transport and Communications, the Ministry of Finance, the Finnish Transport Infrastructure Agency, cities and municipalities.

We express our gratitude to TT-Säätiö (<https://tt-saatio.fi/>) and the PBI Foundation (www.pbifoundation.fi) for financing our project. The valuable comments and input from national and international experts, representing both the public and private sectors, are also greatly acknowledged.

EXECUTIVE SUMMARY

The challenge. Infrastructure investments are important to keep our country as a forerunner in the global race towards a more sustainable society. Our existing infrastructure assets need to be maintained while new assets are developed. High amounts of financing and knowledge are needed to execute these investments in infrastructure successfully and on time. This is even harder with the increased complexity due to digitalization and the need for green transition. As we argue in this booklet, Finland needs to overcome the thresholds of constrained state budgets and find ways to engage the best possible expertise to maximize the value of these coming investments. To do this, the current traditional models to procure infrastructure may not be sufficient. Alternative models, where private partners are given incentives to finance and develop infrastructure, can increase the benefit for society. Nevertheless, based on international evidence, these alternative models can be a two edged sword. To get the alternative models to work, we need to understand when they are usable and what is required from the public and private partners to make it happen.

The opportunity. We believe alternative models can be used to produce infrastructure assets and services benefitting the society in the long run. When private partners are correctly incentivized and controlled they can effectively develop innovative infrastructure without extracting overly high compensations from tax payers. The private financing also help advance some projects so that they are ready clearly before they would have been with state financing. Our country has several of the pre-requisites in place which international evidence has showed to

be important for the alternative models to work. Among other things, our society has a high level of trust among individuals and institutions, stability and a working judicial system. It would be a waste not to use this opportunity to add value to our infrastructure investments and our future.

Way forward. We acknowledge that many projects are not suitable for alternative models and foresee that the majority of infrastructure in Finland will still be financed and delivered the traditional way going forward. Our estimate is that alternative models have potential to account for up to 10% of our future infrastructure projects. To achieve this, capabilities need to be worked on which will take time and commitment. The value for money analysis we did together with authorities on a road project (E18 Raison keskusta, included in this report) showed that there are several considerations to be made before the analysis is viable to be used for choosing the best procurement option. The starting point needs to be political long-term support for starting to use alternative models. Without political support, no functioning market will emerge where firms compete with the best ideas and price. While the private firms may need to re-think their operating cultures and improve on their risk management practices, to engage in this infrastructure market, the way forward starts on the public side. Authorities need to develop processes and tools to evaluate projects in which private involvement can make a difference. This should lead to a pipeline of at least one or two suitable infrastructure projects per year, which would be a good start for the private side to prove their efficiency and innovativeness -and provide value to society.

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1. INTRODUCTION

Finland has taken an important step in creating long-term strategies for prioritizing traffic infrastructure projects (National Transport System Plan for 2021–2032, FI: Liikenne12). The political consensus provides a roadmap for proper planning of when and how single projects should be conducted. Budgetary constraints on the public side may delay projects that are important for societal development and benefits. It is still important to recognize that many of the projects that are part of Liikenne 12 are not suitable to be financed and delivered using alternative models. This is due to complexity causing unreasonable risk carried over to the

private actors. In countries with a long period of experience in privately financed infrastructure, the clear majority of infrastructure projects are publicly financed. The role of municipalities and cities

Many of the projects that are part of Liikenne 12 are not suitable to be financed and delivered using alternative models.

in the development of infrastructure is essential. The piloting of alternative models for financing and delivery of infrastructure can progress more rapidly on the regional level in cities and municipalities than on the national level. They have more autonomy in applying alternative models, both from a political and regulative point of view, where they need to mainly consider and convince a smaller population of citizens.

Thereby, one of **the main issues to stress in the transformation is the early evaluation and selection of projects** suitable for alternative financing and delivery models. This requires both structured processes to evaluate and compare various ways to plan, construct and maintain, where different project evaluation methods are developed and utilized for objective and transparent evaluation.

It takes time to create the capabilities needed for the successful use of alternative financing and delivery models. A structured roadmap for the development work is essential both for planning and to register progress in creating market maturity. Ex post evaluations of projects

delivered by the traditional model and alternative models are essential in further developing the capabilities. A credible pipeline of infrastructure investments that is prepared and procured with alternative models is a necessity. Capabilities and maturity are built by piloting with real cases where private actors find arenas for long-term capability building. Therefore, the trust that the public party has a clear strategy and roadmap for utilising alternative models is the catalyst for the private sector – both nationally and internationally – to be involved. It is essential to point out that alternative models are covering selected categories and types of infrastructure investments. **In countries with long-term experience with alternative models, about 5 – 15 % of overall infrastructure investments are done using alternative models.**

A credible pipeline of infrastructure investments is a necessity.

Can a country’s maturity in delivering Public-Private Partnerships (PPP) be planned and measured? Figure 1 is an example of a roadmap and what activities need to be done to increase maturity. Also, different types of maturity indexes for measurement have been introduced (e.g. APM-Asset Performance Maturity), which can be helpful in communicating and supporting the maturity process.

PPP Maturity internationally

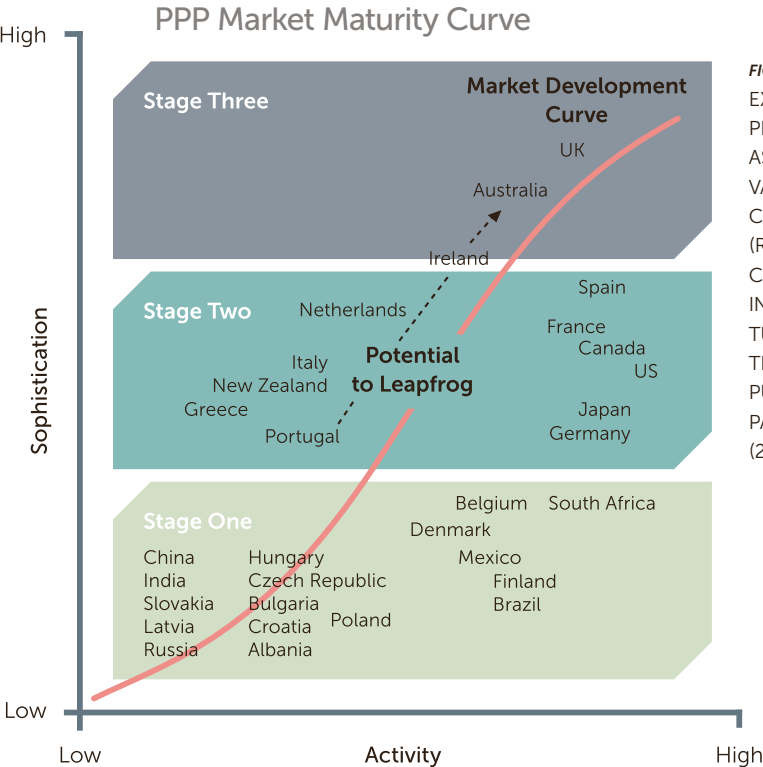


FIGURE 1
EXAMPLE OF
PPP MATURITY
ASSESSMENT IN
VARIOUS
COUNTRIES
(REF. DELOITTE,
CLOSING THE
INFRASTRUC-
TURE GAP.
THE ROLE OF
PUBLIC-PRIVATE
PARTNERSHIPS
(2006).

Stage One	Stage Two	Stage Three
<ul style="list-style-type: none">Establish policy & legislative frameworkInitiate central PPP policy unit to guide implementationDevelop deal structuresGet transactions right & develop public sector comparator modelBegin to build marketplaceApply early lessons from transport to other sectors	<ul style="list-style-type: none">Establish dedicated PPP units in agenciesBegin developing new hybrid delivery modelsExpand and help shape PPP marketplaceLeverage new sources of funds from capital marketsUse PPPs to drive service innovationPPP market gains depth—use is expanded to multiple projects & sectors	<ul style="list-style-type: none">Refine new innovative modelsMore creative, flexible approaches applied to roles of public & private sectorUse of more sophisticated risk modelsGreater focus on total life-cycle of projectSophisticated infrastructure market with pension funds & private equity fundsPublic sector learns from private partner methods as competition changes the way government operations functionUnderutilized assets leveraged into financial assetsOrganizational & skill set changes in government implemented to support greater role of PPPs

2. ALTERNATIVE MODELS



Alternative delivery and financing models for infrastructure have been used by many countries around the world for many years, in both emerging and more developed economies/countries. We have used the two main criteria for selecting 3-4 countries for our analysis:

- Developed countries (also outside the EU) with a long tradition of using alternative models
- An EU-country, preferably one that Finland/the Finnish Transport Infrastructure Agency (FTIA) has collaborated with when developing and adopting PPP procurement processes

Based on the above criteria, we decided to focus on four selected countries: the Netherlands, the UK, Australia and Canada. The Netherlands has a well-established PPP market and, as an EU member state, is contextually interesting to assess from Finland's point of view.

Australia and Canada are globally well-known for having developed their public sector capabilities in close collaboration with the private sector for more than 30 years. This has included extensive work in continuously developing their project selection, evaluation and procurement processes. The UK is interesting because Finland utilized the UK's PPP experience (including contract models) for Finland's first PPP motorway projects (e.g. Vt4 Lahti-Järvenpää, E18 Muurla-Lohja).

The main **similarities for all foreign countries included in this study, is a well-defined, structured process for identifying, evaluating and procuring infrastructure using alternative delivery and financing models.** These are based on legal frameworks, policies and guidelines developed, owned and managed by the public sector. These frameworks are often managed by a dedicated expert organization, typically formed within, and reporting to, the Ministry of Finance or Transportation.

Table 1 summarizes key elements of the governance models and processes in the selected countries, together with a comparison with Finland's current state.

	Canada (esp. Ontario)	Netherlands	Australia	Finland
Volume of projects delivered using alternative models	250 projects, USD 151 billion ³ Includes several types of infra (transport, hospitals, court houses etc)	47 PPP projects since 1990, total value EUR 14.9 billion, out of which ~50% in the transport sector. ~1-3 transport PPP projects initiated/year.	Past 20 years, on average 4-5 projects with an AUD 4-5 billion project value per year.	4 x PPPs since the 1990s, total contract value ~ EUR 1.95 billion ⁴ First PPP in social infrastructure 2020 (Espoon kump-panuuskoulut ⁵)
Share of infrastructure delivered using alternative models during past 10y (2011-2021)	10-15% (est.)	38% of contract value 2010-2018 through PPP (DBFM). Incl. road, water ways, flood protection ⁶	<10% (est.)	~20% for new transport infrastructure ⁷
Legal framework and policy for use of alternative models	Yes	No, PPP policy-based	Yes, national policy applies to all procurement of infrastructure via PPPs.	Liikenne12 describes PPP models (FI: Elinkaari) as one option. Other than that no clear policy for use of alternative models (ad-hoc)

<i>Table continued from previous page</i>	Canada (esp. Ontario)	Netherlands	Australia	Finland
Dedicated organization on Owner's / Procuring agency's side responsible for PPP policies and governance	Yes Infrastructure Ontario reporting to the Ministry of Infrastructure of Ontario	Yes PPP Knowledge Center/Ministry of Finance	Yes Infrastructure Australia as country-level advisor	No Small team of experts in FTIA (FI: Väylävirasto)
Formal criteria/ trigger for evaluating the alternative models	Yes Capital cost > \$100 million or projects involving significant risk/complexity.	Yes >25 € million for accommodation projects, >60 € million for transport infra.	Yes Capital value >\$50 million Also e.g. risk profile, innovation potential, competitive PPP market	No official, Capital costs >100M€ and limited complexity considered criteria/ threshold for transport infra.
Main methods and tools for a) selecting projects b) evaluating suitability of alternative delivery and financing model	a) Cost Benefit Analysis (CBA) b) Value for Money	CBA Value for Money	CBA Value for Money	CBA Value for Money (FI: Verrokkianalyysi)

TABLE 1 OVERVIEW OF GOVERNANCE AND MODELS FOR THE SELECTION AND EVALUATION OF ALTERNATIVE DELIVERY AND FINANCING MODELS FOR INFRASTRUCTURE.

As can be seen from Table 1, the volumes of infrastructure projects delivered using alternative models tend to be in the range of 5-15 %, thereby forming a minority of the countries' total project portfolio. Assuming a 10% range for Finland, this would roughly mean one transport infrastructure project with a capital cost of 200 MEUR capital initiated every 4 years⁸. If we also include other infrastructure asset types (e.g. social infrastructure, ports), this figure would be significantly higher. The main methods and tools (CBA, Value for Money) during the selection and evaluation process are also similar across all countries, including Finland.

2.1 Selection and Procurement processes

Selecting the most appropriate delivery and financing model for an infrastructure project is a crucial step and has major implications for the Owner/Procuring Agency, the private sector and society. The procurement process for alternative models tend to follow the same main steps in all foreign countries studied as outlined in Figure 2 below. Note that the decision to progress with an alternative model (PPP) is taken, once PPP has been identified as the most viable alternative.



FIGURE 2 MAIN STEPS IN THE PROCUREMENT PROCESS FOR ALTERNATIVE DELIVERY AND FINANCING MODELS (PPP).

Even if the steps are similar in all the countries studied, there are numerous variations. Below we have highlighted some aspects that also may be worthwhile considering for Finland.

Procurement strategy & planning

The starting point in Australia is that “no one delivery method is presumed to be more efficient than another” (ref National Policy). Australia has a national policy and well-defined process for evaluating the most suitable delivery model for any infrastructure project. The main stages used in Australia are outlined in Figure 3 below.

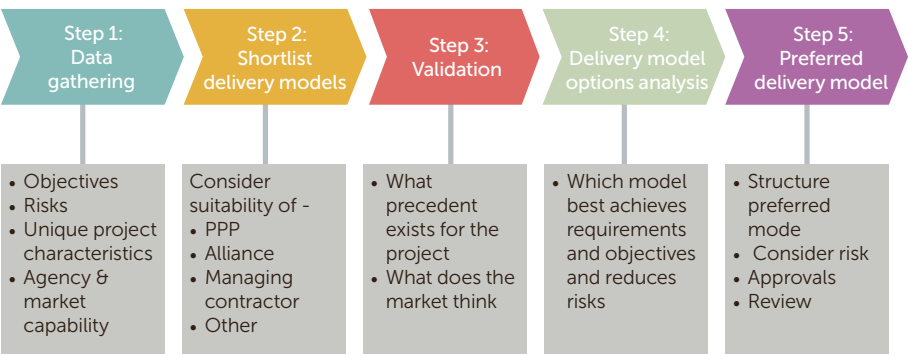


FIGURE 3 AUSTRALIA'S PROCESS FOR EVALUATING THE MOST SUITABLE DELIVERY MODEL FOR INFRASTRUCTURE PROJECTS

For all public infrastructure projects meeting pre-defined criteria, Australian public procuring agencies are required to evaluate PPP as a potential procurement method when conducting the Procurement Options Analysis and seeking government approval (See Step4 in Figure3

above). A crucial part of the Procurement Options analysis is to demonstrate Value for Money. Value for Money is the driver for adopting the PPP approach rather than capital scarcity.

Canada/Infrastructure Ontario uses rigorous Value for Money analysis in pre-defined 3 stages of their PPP procurement process:

1. Prior to the release of the Request for Proposals.
2. Prior to the Financial Close (FC) in the final contract negotiations phase. Value for Money must be demonstrated before entering the final contract.
3. After the final contract has been signed. A public version of the Value for Money analysis is published for all individual infrastructure projects delivered using PPP, in line with their five key principles for PPPs: transparency, accountability, value for money, public ownership and control, and public interest.

In the Netherlands, the Public-Private Comparator (PPC) method (in practice a form of Value for Money analysis) is carried out to determine the contract form. PPC provides insight into the advantages and disadvantages of different models.

Competitive Dialogue during the tendering phase

When tendering for a PPP (DBFMO, Design-Build-Finance-Maintain-Operate) project in The Netherlands, there is a competitive dialogue. The competitive dialogue procedure differs substantially from an 'traditional' open or restricted procedure. The procuring agency and candidates enter into a dialogue with each other about possible solutions. Among other things, they discuss:

- the design;
- the contract;
- the output specifications;
- the financing model.

The aim of the competitive dialogue is to arrive at the optimal formulation of the question for which the candidates can also offer the optimal solution. This dialogue starts with a question for which no unambiguous solution is known. This is different from the 'traditional' tendering procedure.

The award criterion used by the contracting authority in the competitive dialogue procedure for a DBFM project is the most economically advantageous tender. The sub-criteria used for awards are a combination of price-related criteria and qualitative criteria, including a risk management plan. During the Hailuoto PPP procurement process, the weight of price was 80% and the qualitative criteria were 20%. Qualitative criteria included the bidding consortium's project organization and risk management plan.

The biggest difference is in the questioning method. The competitive dialogue starts with a question for which no (clear) solution is known. Based on solutions proposed by the candidates, the contracting authority conducts a dialogue that leads to optimization between supply and demand.

2.2 Lessons learned - the Netherlands

Below we present lessons learned from using alternative models in the Netherlands, where PPP/DBFMO is the predominantly used contract model in PPP projects⁹. So far, most large, complex projects have been PPPs. Contracts, incentives and risk transfer have worked well, especially with relatively simple and stable projects.

However, the infrastructure market for large complex projects is changing. Infra projects are increasingly connected to the surrounding built environment ('a road is not just an isolated road'). Today, there are **fewer and fewer consortia in the Dutch PPP market taking part in procurement processes because the risks are considered to be too large**. Five to seven years ago, on average 5-10 consortia competed in PPP procurement processes. Today, only 2 consortia have typically been interested. Many construction companies have also preferred the subcontractor role instead of the main contractor role¹⁰.

Recently, there have been major cost and schedule overruns in 2 large PPP projects (*A15 road project and the IJmuiden sealoock project*). Based on an analysis made by the Dutch PPP Centre and the involved construction companies, the main reason for overruns was not the PPP contract itself. Instead, the reasons were technical issues and the lack of proper risk analysis during the tendering and design phase. Risks were not properly identified and the impact was underestimated.

The Dutch Ministry of Infrastructure is now testing a more balanced approach to risk sharing between the public and private sectors by doing a few pilot projects. The results of the evaluation of these pilots are expected during 2023-24. The goal of this new approach is to avoid the costs for both the private and public sectors caused by project failures, thereby re-establishing the private sector's interest in large, complex PPP projects. Previously, Dutch PPPs strived to move most, and in some cases 100%, of risks to the private sector. Today - and also as a result of the two projects mentioned above - a more balanced approach is now tested. During the tendering phase, the Dutch procuring authority spends much more effort with the competing private consortiums to better identify and analyse risks. This has led to some of the risk being moved back the public sector ('more 50/50 than 100/0 risk sharing'). This new balanced approach is still being tested, i.e. it has to prove its value. Value for Money must still be proven if and when a larger share of the risks are maintained by the public sector.

In general, PPPs do not work very well in complex projects where a lot of changes can be expected, i.e. in essence, no Value for Money. Considering the increasing complexity and integration of infrastructure to the rest of the built environment, the Netherlands is also assessing whether shorter concessions (20 years instead of the current 30/40 years) would be appropriate. This may, however, increase risk premiums required by the private sector¹².

2.3 Incentives for decreasing carbon emissions

A particular goal for us has been to identify the type of incentives for bidders that are used during the procurement processes to drive the decrease of carbon emissions through the lifecycle of the infrastructure. In practice, we looked for practical schemes on whether bidders receive higher points during the tendering phase, provided they can commit to decreasing carbon emissions during the design, construction and operations of the asset.

In the Netherlands, carbon emissions do not play any role whatsoever when deciding on which delivery and financing model to apply (traditional, alliance, PPP, etc). However, private consortiums can get extra points

during the PPP tendering phase for innovative solutions that decrease carbon emissions during the lifecycle¹³. For Canada and Australia, no concrete schemes could be identified.

PPPs do not work very well in complex projects where a lot of changes can be expected.

The impact of infrastructure projects on carbon emissions is typically considered in Cost Benefit Analysis (CBA). CBA and Value for Money analyses typically interact. If the Value for Money analysis shows higher-than-planned costs, the CBA is updated accordingly.

Fortunately, **there is a growing trend to increasingly include sustainability aspects, both when selecting projects suitable for alternative models and in the contracts themselves**. Delivering climate-smart investments in a world of rapid technological change will require new procurement approaches from the public sector to attract private financiers (ref. European PPP Expertise Centre, Understanding different

partnership models, Membership Discussion Summary Note, Feb 2022). Related to this, the European Investment Bank (EIB) is currently revising its Transport Lending Policy (TLP). The revised TLP '*identifies priorities for EIB support to the transport sector and the provision of mobility services. These priorities seek to identify among the eligible types of investments in mobile assets as well as in transport infrastructure those that are expected to be the most effective in addressing the multiple challenges facing the transport sector and that, therefore, have the greatest impact in transforming transport and making it more sustainable.*' (ref. Draft EIB Transport Lending Policy 2022. The Way Forward Investing in a cleaner and smarter transport system).



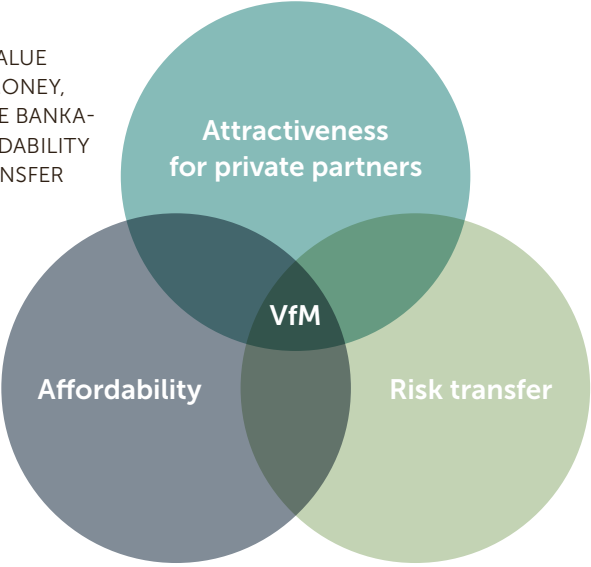
3. ADVANCING SUCCESSFUL PROCUREMENT



The efficiency and innovativeness of markets build on competition. In markets with sufficient competition, bidders have to work hard and innovate to come up with the best solution at an attractive price to get the deals. Ideally, this leads to an outcome where the buyer gets the most value for money spent. An important requirement for this market mechanism to work properly is that there are enough capable bidders taking part in the bidding process. This requirement can only be achieved if there is a consistent long-term demand for infrastructure projects to bid on. Connected to this, it is important that the bidders have trust in the bidding process and have a clear understanding of the grounds on which their bids will be evaluated.

The public sector needs to put some effort into creating attractive alternative infrastructure procurement projects but not sacrificing the interest of tax-payers when doing so. The project should be defined in a way that is attractive to private equity and debt investors. This means that private financiers see the revenues and costs of the project to be on the right level in relation to project risk. It is easy for the government to create attractive projects if the terms for the private investors are too generous. But in this case, the projects are probably not creating value for society. Attractiveness (or bankability) of an infrastructure project is connected to affordability as well as risk transfer, and where these overlap, society gets Value for Money (VfM) as illustrated in Figure 4 (adopted from Bull et al., 2017). In the area where the three domains overlap: the private sector is not charging too high prices for the infrastructure service, the risk transfer is on an acceptable level for the private sector and the public gets value from the private engagement.

FIGURE 4 THE VALUE (VALUE FOR MONEY, VFM) IS WHERE BANKABILITY, AFFORDABILITY AND RISK TRANSFER OVERLAP



The World Bank and the European Investment Bank are knowledge hubs of PPPs, especially on what is required of countries to get active PPP participation from investors and infrastructure contractors. In their publications, these institutions provide lists of what is required from the countries aiming to raise private interest for PPP projects.

3.1 Capabilities required from the public sector

To attract private interest to PPP projects, there need to be political commitment and organizational capability. These are very important to get presumptive private partners to engage in the procurement process. The political commitment results in several things that are

readily observable to the private partners, and it will then incentivize them to invest in the capabilities needed to engage in the tendering processes of the projects. The threshold to make these investments is lower if the private partners can

To attract private interest to PPP projects, there need to be political commitment and organizational capability.

rely on the political commitment to produce a continuous stream of interesting projects.

Finland has several important capabilities for successful infrastructure procurement already in place. Our organizational structures and governance are generally appreciated by institutional investors. There is clarity and stability in the laws and legal framework. Finland has a good level of trust among people and organizations in the society and security that the public sector will honour its obligations. So, when considering the current situation, Finland scores high on these common prerequisites for attracting investments also from abroad. However, Finland has some homework to do to create an attractive market for firms to engage in bid processes for alternative infrastructure procurement.

When considering building a functioning market for alternative financing and procurement models for infrastructure, it is important that the threshold for engaging in the bidding process is kept low. This threshold can be lowered in several ways and some of these requirements may go beyond the specific scope of this work, such as how to secure that all major regulatory approvals for infrastructure projects are received smoothly and without delays. Our focus here is more on how to build on the current structures of authorities and government to further build on the capabilities required for successful alternative infrastructure procurement.

Finland has several important capabilities for successful infrastructure procurement already in place.

The criteria for how bidders and bids are evaluated should be transparent and well specified. To meet these requirements, the public sector’s team and consultants need to be of high quality. To get the private sector interested in spending money and time to be able to make bids involving all or some of the components of designing, building, financing and maintaining infrastructure, there needs to be trust that the market will be continuous. **The private sector participants must be convinced that there will be a steady stream of projects coming up** that they can bid for in order for them to acquire the preparedness to make bids.

The public sector needs to set up clear processes to ensure that infrastructure projects suitable for alternative procurement models are identified on a continuous basis. From international experiences and research, it is evident that a higher private involvement is not suited for all

kinds of projects. A higher degree of private involvement will likely deliver more value in relatively simple infrastructure projects (roads, energy production, tramlines) in which the outcome is clearly and objectively measurable. However, there are many examples where private partners run complicated projects for which it is hard to determine the service quality (hospitals, schools). In these cases, it is important to distinguish the projects where the PPP firm designs, builds and maintains the building (as in recent projects in the city of Espoo regarding day care and schools) and the projects where private partners are also responsible for delivering the health- or education services.

Determining whether or not a project is a success becomes more complicated, the more non-monetary values are involved that need to be weighted to monetary ones, and the harder it is to estimate the outcomes. Romero (2015) illustrates this with a hospital PPP in Lesotho. The project was criticized in one study because of its high public cost, whereas another study found it a success because of the better treatment of patients. When it comes to the private delivery of education services, one can follow the public debate in Sweden on whether or not private schools are good, a debate that has been going on for at least a decade with seemingly no clear outcome. As for delivering and maintaining only the building, some research can be found that concludes that the often better physical surroundings of a PPP-schools improve educational outcomes (Tirumala, et al., 2021).

In creating clear criteria for which type of projects are suitable for alternative procurement methods, the public sector also needs to assess the resources and interests of the potential bidders. In a small market like Finland, project size is likely to be important. The projects should be of sufficient size but should not be too large so that the balance sheets of potential domestic bidders limit the bids. Based on our discussions with the industry, a suitable size for projects to start with may be in the low triple-digit million range.

It is important that the government creates a structured process with clear criteria to determine which of the upcoming projects will be eligible for alternative procurement methods. This method should be applied continuously to all projects and might include two or three phases. In the first phase, there should be an initial screening of the projects planned for the years ahead, and the projects that appear suitable for alternative procurement and financing models should be identified. This should be done with a checklist focusing both on projects with attributes that

make them suitable to be procured through alternative financing models and based on the capabilities and interests of the prospective bidders in the market. When going through the checklist for projects, it should also be kept in mind that the project flow of suitable projects should be kept at a sufficient level. At the start and based on our interviews with industry participants, this level could be around 1-2 projects coming up for tendering per year.

As mentioned earlier, it seems that 5-15% of the infrastructure investments in a country could be suitable for alternative procurement and financing models. In our previous report¹⁴, we estimated that Finland's economic infrastructure investments will be at least in the tune of EUR 5 billion per year in the foreseeable future. The majority of these investments are roads and bridges, electricity and heat generation, airports, rails and tracks, and communication infrastructure assets which could be well-suited for a higher degree of private engagement.

In the second phase, the projects' VfM should be assessed. It is assumed that all of the projects clearing the checklist in the first phase will not result in positive VfM for society. It is difficult to assess the fall out of projects at this VfM stage, but it is clear that VfM analysis should be carried out for a larger number of projects than those that end up being tendered. In order to carry out several VfM -analyses per year, the VfM process must be standardized, and officials involved should have the needed support and resources to carry it out. The process should be carried out in due time, be transparent and have the results published.

Many countries have separate PPP units with several or tens of employees to oversee alternative models of infrastructure procurement, including VfM analyses. We argue that Finland does not yet need a separate PPP unit at this stage to be able to use alternative infrastructure procurement models, but it is clear that the analysis of prospective projects can not be done on top of the officials' current responsibilities. Authorities should budget time for the personnel needed to be able to use alternative infrastructure procurement. It is important to allocate time for systematic VfM analyses.

Finland does not yet need a separate PPP unit.

3.2 Assessing Value for Money for E18 Raising keskusta

As part of our project, we made a VfM analysis for the project E18 Raising keskusta for which FTIA (Väylävirasto) has made a roadplan¹⁵. This roadplan is now waiting for approval at Traficom (the Finnish Transport and Energy Agency). The project has been included in FTIA's investmentplan for 2021-2028.

The goal of this Value for Money case-study was to provide input for Väylävirasto and the Ministry of Transport and Communications' decision making, when selecting the optimal delivery and financing model for the E18 Raising keskusta project. In the VfM analysis, the international VfM best practice was also tested in the Finnish context.

The construction was initially scheduled to start in the year 2023. E18 Raising keskusta is part of a wider improvement initiative for the ring road that extends from Naantali to the Turku-Helsinki motorway. E18 Raising keskusta is a complicated project as it goes through the city and includes three-level junctions and the building of a new 432 meter long road tunnel. The latest cost estimate for the project is EUR 205 million.

The VfM calculation process included several workshops and meetings together with specialists from Väylävirasto, the Centre for Economic Development Transport and the Environment (Varsinais-Suomen ELY), Fintraffic, Åbo Akademi University and PBI Research Institute. The primary goal of the workshops was to estimate the monetary value of various risks. The base for the calculation was the preliminary cost budget which was index-adjusted (MAKU-index value of 130) so that the construction costs were increased to EUR 204.75 million. The calculations assumed a concession period of 20 years, the first 3 years being the construction period.

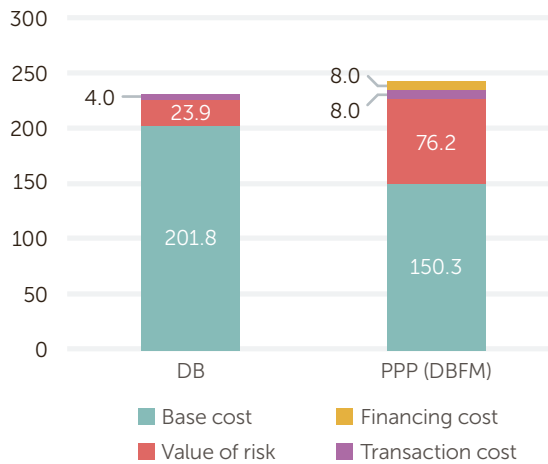
The base cost, financing costs and costs of risks usually make up most of the costs of infrastructure projects, and this was the case also in the E18 Raising keskusta. The base cost includes construction costs and the maintenance costs for the road to the end of the concession period, which in the PPP alternative are both discounted to present value using a discount rate of 3.5% p.a. In the traditional procurement model (design-build, DB model – in Finnish Suunnittelu-Toteutus), the base cost also includes discounting but to a smaller degree. In the DB-model, the owner is assumed to purchase maintenance from private contractors.

The estimates of maintenance costs are the same in both models, neither is there assumed to be any differences between the models due to innovation or cost efficiency.

In the DB model, the construction outlays are assumed to occur in equal installments during the construction period where the payments for year two and three are discounted, and the maintenance fees during the operation period are also discounted. The discounting of the service payments which in the PPP model start when the project is opened and lasts 20 years into the future, leads to the clearly lower base cost in this model compared to the DB model. A longer concession period would further increase the difference between the base costs of the two models due to the discounting of the service payments, assuming that the longer concession period would not drive up the financing costs for the PPP firm.

The most challenging and ambitious part of the calculation is the estimation of probabilities of the occurrence of various risks and their financial outcomes. As the graphs show, in the PPP model (DBFM, availability-based) the private parties are estimated to bear a big part of the risks compared to the DB model. From the owner's perspective, the value of the risks are reduced from EUR 23.9 million in the DB model to EUR 8.0 million in the PPP model. The largest risk transfers occurs in the residual value of the road in the end of the construction period, which is clearly lower in the PPP model as the private parties have incentives and contractual obligations to keep the asset in good condition. Other large risk transfers to private parties occur in the construction phase and procurement phase. It is assumed (and there is available evidence) that the private parties are generally better at handling these kinds of risks.

Figure 5 shows the result of the VfM calculation. We have not included any financing costs of the state or lost societal benefits. The graphs show that there is no VfM from Väylävirasto's perspective to be obtained from the PPP structure. The PPP alternative has EUR 12.8 million higher total costs compared to the DB model. It would be appropriate to include lost social benefits in the graphs. The lost societal benefits are the result of possible delays in getting the project started and the road opened. It should be noted that the graphs do not include the financing costs of the state. Arguably, the state has a cost to finance, especially the construction costs in the DB-model. But it also could be argued that the payments made in the PPP alternative (starting at EUR 19.2 million in year 4) would need to be financed at a cost.



The PPP has a VfM of EUR -12.8 million (or 5.6% higher cost relative to the DB option).

FIGURE 5 COMPONENTS OF VFM CALCULATIONS FOR E18 RAISION KESKUSTA (EUR, MILLION). DB = DESIGN-BUILD. NUMBERS SHOW THE COSTS FROM THE PROCURING AGENCY'S (VÄYLÄVIRASTO) POINT OF VIEW.

All in all, the VfM analysis clearly showed that national guidelines and policies for VfM are missing in Finland. The key principles that should be defined are criteria when VfM should be calculated, how to calculate financing costs when using the DB model, and the methodology for calculating lost societal benefits. Collected statistical data on completed projects (planned versus actual) would also increase the reliability of future VfM analyses. It is to be noted that the PPP contracts in Finland are relatively short compared to international standards. **The discounting of future cash flows has a substantial effect on their present value in contracts potentially spanning over several decades.** The state budgeting is generally done at nominal values, which can lead to situations where infrastructure procurement methods, contracts lengths and risk allocation decisions are chosen based on nominal values and not - at least theoretically better - investment calculations. Proper guidelines on when and how to use present values in the decision-making should be set up.

The VfM analysis clearly showed that national guidelines and policies for VfM are missing.

3.3 Capabilities required from the private sector

Based on our discussions with PPP authorities, construction companies and investors, engaging in large infrastructure projects that include responsibility for financing and long-term obligations, requires special

capabilities from the partners in the private sector. The private sector needs to understand that **there is a clear difference between delivering a building or other asset and delivering a service for many years.** The latter include capital requirements, risk management practices and efficient service delivery, which many construction- and/or industrial companies may not be as familiar with. Already the bidding process for the contract may require a new way of thinking about co-operation with peers and commitment to a life cycle approach and being service-orientated.

Table 2 below summarizes specific skills, values and organizational capabilities needed to successfully engage in the design, build, finance and maintain types of infrastructure PPP contracts. The challenge is that it is not only about specific skills that may be relatively easy to acquire or learn in the organization, but also about organizational structures and values that may require a change in the employees' mindsets. Change of mindset may include for example, service orientation, willingness and trust to work closely with other (external) organizations to reach a common goal. Similarly, while risk management may be easily stated to be a top priority of an organization, and a common list of risk management procedures may be listed, these have little effect if they are not followed throughout and enforced.

	Specific skills	Values	Organization
Bid phase	Understanding of life-cycle approach and knowledge about which skills are available in-house and which are missing	Willingness to create and build relationships and network with partners	Management commitment to engage in large and long-term infrastructure service delivery
	Critical analysis of strengths compared to competitors for deciding when to take part in bidding processes	Ability to work together with other organizations to reach a common goal	Commitment to stakeholder management
	Risk assessment knowledge	Service oriented mindset	Sufficient financial strength
Maintenance phase	Design and construction knowledge	Focus on long-term value creation even if it means sacrificing short-term profits	Appropriate long-term remuneration policies for personnel
	Insight into how to contract or manage cost efficient maintenance operations		High priority on holistic and efficient uncertainty and risk management
			Ability to handle complexity and conflicts

TABLE 2 CAPABILITIES OF FIRMS ENGAGING IN DBFM INFRASTRUCTURE PROJECTS

4. THE WAY FORWARD

We argue that Finland could gain from the use of alternative models for delivering part of the country's infrastructure. Utilizing alternative models would help speed up the delivery of infrastructure important for societal development, benefits and decreased emissions.

Below we outline what we consider important steps in increasing Finland's market maturity and capabilities to use alternative delivery and financing models.

4.1 Public sector and political decision-makers

The steps outlined below are targeted primarily towards Ministry of Finance, Ministry of Transport and Communications, the Finnish Transport Infrastructure Agency (Väylävirasto), cities and municipalities, potentially also wellbeing services counties (FI: Hyvinvointialueet) for facilities.

1. **Political long-term acceptance and commitment** to using alternative models *for a minority of infrastructure projects and where private involvement brings added value to society.*
2. Create and maintain a **long-term roadmap** (~10 years) on how to build market maturity for using alternative models for different infrastructure categories. For transport infrastructure, the roadmap should be aligned with Liikenne 12.
3. Define **national-level policy and guidelines** for a) selecting and b) evaluating projects suitable for alternative models. A key part of this includes developing the principles and guidelines for Value for Money (VfM) analysis. For VfM, it is most important to define when VfM shall be carried out, the financing costs for public money and the principles for estimating lost societal benefits (FI: menetetyt yhteiskuntahyödyt). Collaborate with the private sector when developing guidelines.
4. Create a **project pipeline** of sufficient volume (5-10% of projects across all infrastructure categories). Assuming a 10% range for Finland, this would roughly mean one transport infrastructure project with a capital cost of 200 MEUR capital initiated every 4 years. This will

enable the private sector to develop and maintain capabilities for participating in procurement processes involving alternative models. The key would be to identify suitable projects through proper project evaluation and technical and financial due diligence to lower risk in the first series of projects.

4.2 Private companies

To engage successfully in the design, build, finance and maintain types of infrastructure projects, private companies may need to make adjustments to their usual ways of operating. It may require a cultural change in companies so that relationship-building with suitable peers is highlighted and the focus is shifted from being asset- or product-centred to a stronger emphasis on service delivery. This relationship-building with partners having complementary skills and/or assets could start even before any projects are available so that the consortia are ready to make the bid when the time comes. It is also of utmost importance to understand one's strengths and limits in terms of capabilities, financing and risk tolerance to be able to select the right projects to bid on.

With commitments to long-term projects spanning several decades and involving high monetary stakes makes risk management a very important activity which should be prioritised. Incentivization policies of managers and other personnel are another specific domain that may need to be rethought when switching to delivering long-term projects. The remuneration policies should be formulated so that they reward value generation over the entire project instead of short-term cost savings and profit maximization.

NOTES

1 Alternative financing and delivery models there is a higher degree of private involvement in terms project development, project financing and risk sharing.

2 See e.g. Väylä tulevaan, Valtiovarainministeriön julkaisuja – 34/2018, 'Liikennehankkeiden tuottamien vaikutusten hyödyntäminen osana hankkeiden rahoitusta - Valtioneuvoston selvitys- ja tutkimustoiminnan julkaisusarja 2021:16, Spohr, Wikström, Stenman: Infrastructure investing. Beyond the fund model. PBI Foundation (2018).

3 Note: The total amount of projects and investment involve all the projects in different stages until December 2019.

4 Vt4 Järvenpää-Lahti 240M€ (1997), Muurla-Lohja 700 M€ (2005), Kotka-Koskenkylä 623 M€ (2011), Hamina-Vaalimaa 378 M€ (2015)

5 <https://www.espool.fi/fi/asuminen-ja-rakentaminen/rakentaminen/espoon-koulukokonaisuus>

6 Procured by The Directorate-General for Public Works and Water Management. Source: Ministry of Infrastructure and Water Management: Perspective on the challenges and opportunities for improvement in the civil engineering sector (2019) (report in Dutch)

7 Service payments from existing PPP motorway contracts ~ 100M€/y. The Finnish state has invested on average 500MEUR/y in new transport infrastructure, which implies a ~20% share of investments through PPP for new transport infra.

8 ~500MEUR/y spent by the Finnish state on traffic infrastructure (FI: kehityshankkeet). $10\% \times 500\text{MEUR} = 50 \text{ MEUR/y}$, i.e. 200 MEUR every 4th year.

9 Interview with Erik Jan Snik/PPP Knowledge Center, Ministry of Finance in Netherlands

10 DECASUS international roundtable, 7 Feb 2022

11/12/13 Interview with Erik Jan Snik/PPP Knowledge Center, Ministry of Finance, the Netherlands

14 Spohr, Wikström, Stenman: Infrastructure investing. Beyond the fund model. PBI Foundation (2018).

15 <https://vayla.fi/raision-keskusta>

REFERENCES

Bull, M., Mauchan, A., and Wilson., L., (2017). Toll-road PPPs -Mitigating and managing traffic risk, PPIAF, World Bank Group

European PPP Expertise Centre, Understanding different partnership models, Membership Discussion Summary Note, Feb 2022

Haapamäki, T., Väänänen, T., Kantala, T., Wikström K., Jungar, A., Spohr, J., Falkenbach, H., Laakso, S., Ekroos, A. (2021). 'Liikennehankkeiden tuottamien vaikutusten hyödyntäminen osana hankkeiden rahoitusta - Valtioneuvoston selvitys- ja tutkimustoiminnan julkaisusarja 2021:16.

Romero, M.J., (2015). 'What lies beneath? – A critical assessment of PPPs and their impact on sustainable development', a publication by Eurodad, European Network on Debt and Development, 1-35.

Tirumala, R. D., Dangol, N., Tiwari, P., and Vaz-Serra, P., (2021). Comparative analysis of outcomes under PPP and traditional modes of delivery: a study of schools in Melbourne, Construction Management and Economics, 39(11), 894-911.

Closing the infrastructure gap, The role of public-private partnerships, Deloitte (2006). Available from:
<https://www2.deloitte.com/ie/en/pages/finance/articles/closing-the-infrastructure-gap.html>

Numerous web sources, including e.g.
<https://www.infrastructureontario.ca/en/>

<https://www.infrastructure.gov.au/infrastructure-transport-vehicles/infrastructure-investment-project-delivery/national-guidelines-infrastructure-project-delivery>

Important data sources included also interviews with international and national experts and an international roundtable session.

APPENDIX

Infrastructure Ontario's procurement process

Infrastructure Ontario considers a range of 11 different procurement options in delivering its major infrastructure projects, ranging from traditional Design-Bid Build (DBB) and Integrated Project Delivery/Alliance to models with larger private involvement such as DBFM (commonly used for transportation projects, hospitals and court houses) and DBFOM (some transit projects) as well as Revenue Risk Concessions.

Procurements for PPP-projects proceed by way of a two-stage, public, open qualification process followed by an invitational request for proposals issued to prequalified parties. All procurements are monitored by an external fairness advisor to ensure openness, transparency and fairness (<https://www.infrastructureontario.ca/WorkArea/DownloadAsset.aspx?id=36507222863>)

Main steps in the procurement phase are outlined in Figure 6 below.

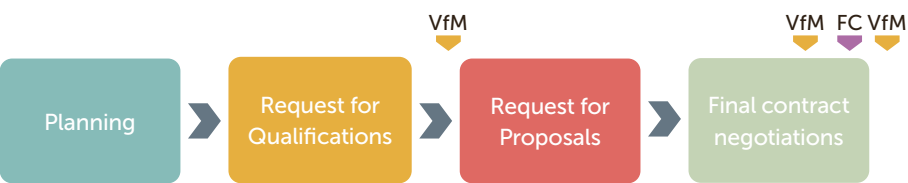


FIGURE 6 MAIN STEPS IN CANADA/INFRASTRUCTURE ONTARIO'S PROCUREMENT PROCESS FOR PPP PROJECTS. VfM = VALUE FOR MONEY ANALYSIS, FC = FINANCIAL CLOSE

Infrastructure Ontario (IO) is assigned a project by the government following the Treasury Board's approval with a set budget and delivery timelines. The assignment takes place through Letter of Direction by the Ministry of Infrastructure.

Request for Qualifications (RFQ)

Once a project enters the procurement phase, a Request For Qualifications (RFQ) invites bidders to provide information and demonstrate proven abilities in a number of areas including their financial strength, past experience, capacity and more. Following the RFQ, Infrastructure Ontario publicly announces the short list of prequalified bidders on their website. The short list of prequalified bidders announcement will provide detailed information about the teams that have committed to participating in the request for proposals (RFP) stage of a project. The RFQ is issued for a project via a dedicated portal (www.merx.com) to invite interested companies to submit their qualifications for a project. IO encourages interested businesses to contact prequalified bidders directly to inquire about opportunities. When possible, IO organizes networking sessions to provide opportunities for interested bidders to meet local subcontractors.

Request for Proposals (RFP)

An RFP is issued only to prequalified or shortlisted project teams. The RFP sets out the conditions and specifications required to undertake the project and asks bidder to submit their proposals to meet and/or exceed these specifications. Following the evaluation of RFP submissions, the highest ranking bidder is identified as the 'preferred proponent'. Infrastructure Ontario and the client proceed to negotiate a final contract with this proponent. Once negotiations with the proponent are complete, IO announces the winning bidder.

The Value for Money (VfM) is assessed at **three different stages in the procurement process:**

Stage1 - Authorization to release the Request for Proposal (RFP)

The release of all RFPs by IO must be approved by its Board of Directors. The IO Board does not approve the release of an RFP unless, among other factors, positive VfM is demonstrated. IO has publicly available guidelines for how VfM shall be conducted (ref. <https://www.infrastructureontario.ca/Value-For-Money/>)

Stage2 - Authorization to enter into the Project Agreement

After the end of the RFP process, bids are evaluated by an evaluation committee. The preferred bid is identified, and the VfM is updated to

reflect the actual bid costs. The updated VfM is presented to the IO Board of Directors. The IO Board of Directors will not approve proceeding with the PPP procurement unless positive VfM is demonstrated.

Stage3 - Publication of the VfM analysis post Financial Close. After the project agreement has been finalized and financial close achieved, IO prepares and releases a final VfM analysis in a public report. The objective of the report is to provide the public and others with an understanding of the project and the basis for the decision to deliver the project via PPP.

In late 2021, IO introduced its new 'Progressive Procurement P3 Strategy' which strives to '*foster collaboration between the owner and its contracting partner*'. The Progressive Procurement P3 Strategy will initially apply to hospital and other social infrastructure projects, where appropriate, based on the features of the project (size, complexity, physical or geographic constraints, etc.). The new strategy will be piloted in three hospital projects and two transit projects. The difference in this model is in the project development phase where the owner and industry parties will '*collaborate in good faith and assess the risks properly in order to lead to a smooth implementation period*'. (ref. Infrastructure Ontario P3s FAQ and <https://canada.constructconnect.com/dcn/news/infrastructure/2021/10/ontarios-new-p3-procurement-strategy-based-on-good-faith-collaboration>). This seems to be a similar approach to the IPD/Alliance model, where the project is developed in close collaboration between the Owner and its contracting partner(s).

