

Procurement for Innovation – Making Innovation a Reality

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ABSTRACT: *It is said that ‘necessity is the mother of invention’ and in an environment of squeezed budgets and increasing regulation, meeting the growing demands of the community relies on changing established practices. The question is: How do we get the profit reliant private sector to deliver innovation and clean technology for the risk averse public sector?*

Procurement for innovation is an innovative method of contract purchasing which stimulates market demand and supply through public procurement. Using the substantial buying power of public sector procurement, this method is a way to move markets to innovate and substantially produce clean technology solutions to an existing problem. Essentially, a public sector procurer establishes a commitment to procure in the future a product which responds to their need and which is not yet available on the market.

By making this commitment, suppliers on the market are assured that if investment in research and development of a response to the unmet need is undertaken, there is a commitment to procure when the public sector buyer goes to tender.

The City of Greater Geelong undertook a procurement for innovation process to obtain a new replicable pedestrian bridge with zero maintenance over a 100+ year design life. The outcome of the process is a ground breaking structure locally developed and manufactured.

KEYWORDS: Procurement for Innovation, public sector, private sector, bridges, clean technology, problem solving.

1. Introduction

Governments are increasingly being faced with the perfect storm of increased service demands and operational standards, reduced revenue, decreasing supply of cheap natural resources and increased waste disposal costs. In order to maintain services and infrastructure without altering revenue streams requires changing established practices for options which present lower costs, longer life cycles and greater reuse of existing materials.

It is likely that the alternatives to established practices may not yet be developed or are awaiting support to enable them to be brought to market. The challenge of government is in creating an environment which supports the development of disruptors to established practice.

2. Innovation

The Collins Dictionary [1] defines Innovation as the introduction of new ideas, methods, or things. In the context of our constrained government operating environment, innovation is a disruptor of established practice.

2.1 Barriers to Innovation

The process of innovation generally requires a lengthy development period at significant cost, with no guarantee that these costs will be recovered in the future, much less a profit made. However, when truly innovative and well marketed, a product can be highly lucrative for industry.

As Steve Jobs [2], the cofounder of Apple once mused “I’ve always been attracted to the more revolutionary changes. I don’t know why. Because they’re harder. They’re much more stressful emotionally. And you usually go through a period where everybody tells you that you’ve completely failed.”

It was through the innovative development of the iPod and then the iPhone that Apple turned its fortunes around in a growing technology market and became one of the biggest companies in the world.

Torben Rick [3] in his blog on business improvement, change management, organizational culture and strategy identifies a number of barriers to innovation within companies including:

- Lack of “spec time” to develop new ideas and opportunities
- Risk aversion
- Focus on successes of the past rather than the challenges of the future
- Politics – efforts to sustain the status quo to support entrenched interests
- Internal process focus rather than external customer focus
- Inadequate understanding of customers

These barriers have been the downfall of many previously household name businesses including Kodak, General Motors, Nokia and Blockbuster, which allowed others to innovate and grow around them whilst steadfastly defending their previously successful products and business models.

Whilst the risk to profitability is not specifically a driving force in innovation for the public sector, a reduction in service levels due to higher costs and constrained budgets, leading to negative public perception and local community discontent, provide the impetus to innovate. Opposing this is a risk aversion based on generating the same negative public perception and local community discontent through project cost blowouts fixing failed assets where innovative product use has not been successful.

Given the significant risks and challenges to innovation, how can we get the profit reliant private sector to deliver proven innovation and clean technology for the risk averse public sector?

3. Procurement for Innovation

Procurement for Innovation is about bringing new, innovative products or services to market that:

- Have Impact – the scale of the product is such that it can influence social, environmental or economic factors within a region or help address a reputational risk.
- Are Strategic – the fulfilment of the unmet need also addresses policies, strategies and governance requirements imposed on the purchaser.
- Are Replicable – it is not a one off or iconic product, but can be marketed to a wider audience than the original purchaser of the product.

The Procurement for Innovation process is ideally suited to addressing the risk aversion of the public sector in that it provides time for the market to respond to the unmet need through development and testing of solutions to prove suitability. The process also has benefits for the private sector in that it provides:

- More assistance in order for a solution to be developed
- confidence that there will be a market once the solution is proven through direct government procurement and government procurement networks
- certainty of future sales for the winning supplier from the initial purchaser
- a legitimacy to an innovative product through government use

Delivering a successful Procurement for Innovation requires an understanding of the additional steps over a traditional procurement process and a specification which defines the challenge to be responded to, not the product to do it.

3.1 Standard Procurement V Procurement for Innovation

The standard procurement process for established goods can be broken down into five key steps:

1. Engage with Market or Expression of Interest
2. Tender
3. Award Contract
4. Contract Management
5. Product Built

With Procurement for Innovation an additional four steps are added to the process. The additional steps allow for greater interaction with those likely to create the innovation and provide them the support and time to innovate so that the unmet need can be satisfied. In its full process the steps are:

1. Engage with Market
2. Expression of Interest
3. Shortlist of those needing support
4. Engage with Market
5. Refine Tender
6. Tender
7. Award Contract

8. Contract Management

9. Product Built

The process is a collaborative approach between the purchaser and potential suppliers to develop solutions to the unmet need, such that multiple options are available when the final tender is let.

3.2 Procurement for Innovation Specification

Whilst traditional procurement specifications can list in detail the solution to be delivered including products to be used, Procurement for Innovation specifications need by necessity remain performance or outcome based without defining a solution.

Procurement for Innovation specifications need to contain an aspiration which needs to be met. This unmet need should be clearly described so that the market can understand what is trying to be achieved, but avoid specifying the solution (i.e. choosing products before having really described the challenge being responded to).

When writing the aspiration, ask yourself:

- 'what is the problem we are seeking to address?'
- 'what is the need that is not yet being met?'
- 'what policies, strategies and targets might this innovations help achieve?'
- 'are there any future needs that this innovation will also meet?'
- 'what will be the issues/impacts if we do nothing?'

In addition to the aspiration, Procurement for Innovation specifications should provide general details on outcomes required of the solution (i.e. size, performance criteria, etc). The provision of general details should enable a conforming solution to be deemed fit for purpose.

3.3 Zero Mattress Solution for Prisons

Procurement for Innovation was formerly known as Forward Commitment Procurement (FCP). A method developed in the United Kingdom (UK), Her Majesty's Prison Service (HMPS) provided one of the first opportunities to test the method. HMPS was spending substantial portions of its annual budget managing the waste generated from routine mattress replacement. Historically, the majority of waste mattresses and pillows from HMPS were sent to landfill or incinerated as clinical waste [4]. The increasing costs of disposal together with a

drive to reduce volumes of waste to landfill driven by Central Government through the Sustainable Operations on the Government Estate (SOGE) targets, brought this problem into focus. HMPS worked with the Department of Trade and Industry/ Department for Environment Food and Rural Affairs (DTI/DEFRA) Environmental Innovations Advisory Group and Office of Government Commerce (OGC) in the first FCP demonstration project to deliver an innovative solution to the problem of waste mattresses going to landfill. A forward commitment was made to procure zero waste mattresses; an innovation which was not already available on the market.

The forward commitment made by HMPS had a three-year deadline. This gave the market time to research and develop the manufacture of a zero waste mattress which, when HMPS went to tender, the market was able to respond. In line with the principles of FCP, HMPS identified their unmet need and consulted with the market to find a way to deliver their requirement in a cost effective way. This led to a fundamental shift in the procurement approach and, after trials, the procurement in March 2009 of a fully managed Zero Waste Mattress system.

4. 100 Year Maintenance Free Bridge

The City of Greater Geelong is a rapidly growing municipality, with large rural areas being developed into urban residential zones. This development has led to the construction of numerous water bodies for drainage purposes and a corresponding network of bridges to connect pedestrian pathways. During routine condition assessment it has been identified that many newer bridges installed using timber components are failing to meet expected design life and require costly maintenance intervention within the first 10 years of life. This coupled with the needs for rehabilitation and replacement of older mixed material bridges in the municipality is creating a strain on existing budgets and necessitates alternative practices be established to prevent a loss of connectivity from bridge closures.

The undertaking of a Procurement for Innovation process was determined as a positive way of challenging the market to address the high maintenance costs associated with traditional recreational bridges, whilst helping to develop an industry within Geelong which could offset job losses in the manufacturing industry. By making the product replicable and scalable, it was intended that it

could be marketed to other municipalities and developers, thereby generating future sales beyond the Geelong municipal region. The process was jointly run through the City of Greater Geelong's Engineering Services Department and Cleantech Innovations Geelong [5]

4.1 Specification

The expression of interest specification released by the City of Greater Geelong as part of the Procurement for Innovation process remained brief by necessity, allowing innovation and product development to be the key outcome focus. The specification was limited to four key headings, background; aspiration; best value; and details.

Refinement to the specification at the time of issuing the final tender was limited to identifying the structures to be replaced, their dimensions and site conditions applicable, thereby maintaining the intent for innovation to be key.

4.2 Expression of Interest Specification

Background:

The City of Greater Geelong owns and manages approximately 160 bridge assets, many of these are timber and steel pedestrian bridges which are in various conditions and present an ongoing maintenance liability for the City. The City of Geelong's commitment for the ongoing procurement of this bridging system will be in the order of \$150k-\$200k annually.

Aspiration:

A bridge system which is maintenance free for the design life of the structure (100+ years) with all materials reusable or recyclable at end of life.

Best Value:

Best value for money is defined in the context of this procurement as a whole of life cost of the structure including the maintenance, disposal, quality of product, performance of product, level of service to the community and upfront cost.

Details:

- The City proposes 3 bridging system solutions:
 - Small Bridges:
 - Single span <12.5m
 - Width of 2.5 – 3.5m clear trafficable area.
 - Large bridges:
 - Single Span 12.5m to 22m
 - Width of 2.5 – 3.5m clear trafficable area.

- Boardwalk structure: replicable modular unit to provide a boardwalk with or without a handrail
- The structure should be able to perform in the variety of environments and applications which may be expected within the City: over waterways, in saltwater environments, in a viaduct application, etc
- The structure shall provide an acceptable level of service over the duration of its design life without any need for structural maintenance.
- The structure shall be capable of withstanding a 'typical' flood event The footing system can be designed to suit each specific site (i.e. not explicitly a part of the bridging system)
- The aesthetics of the bridging system shall be somewhat customisable on different applications, this may be achieved through different colouring, feature cladding, sympathy to the surrounding environment and iconic status.
- Assembly of the structure shall be possible by appropriately skilled, but non-specialist, crews based on following construction plans
- The final structure weight should be kept to the minimum possible whilst still being compliant with the requirements of the bridge code.
- The structure should be vandal resistant and easily able to be cleaned of graffiti without causing damage to the lifespan of the components. Components should have a level of interchange ability to enable repair or replacement where necessitated.

4.3 Commercialisation Filter Panel

Through the innovation incubation stage of the procurement process, companies who had registered an expression of interest were provided with an option to obtain support to develop their concept into a marketable product. Support ranged from business network introductions to limited funding support provided by the sponsor group.

To best assess the level of support required by a company and the likelihood of their concept possessing the potential to succeed, concepts were reviewed by an independent panel of business experts. This group was known as the commercialisation filter panel. Invitations to sit

on the panel were sent to a mix of local business leaders, major land developers, local government aligned research and development organisations and industry bodies. The final panel membership comprised a cross-section of people with expertise in commercial sales, development of innovative technology and those who traditionally purchase bridges outside the local government sphere.

After the commercialisation filter panel considered the concepts and requests from companies seeking support, they then provided recommendations to the project sponsors.

4.4 Market engagement

Engaging with suppliers is a fundamental part of the Procurement for Innovation process. It is carried out twice throughout the process. In the first instance to ensure the way the tender is being specified reflects that the market is able to respond. Secondly, to assist suppliers in creating a response to the output specification.

The City of Greater Geelong proactively engaged with the market at an early stage in the Procurement for Innovation process to give potential suppliers advance notice of their requirements, get feedback on their requirements from the supply chain, and support cross fertilisation across different supply chains.

Market engagement allows for a better informed procurement process, as well as the reassurance that the market is willing research and develop a response to the unmet need.

4.5 Tender Assessment

The traditional tender assessment scoring criteria used for procurement was modified to reflect the outcomes sought from a Procurement for Innovation tender.

The weighting for the total acquisition cost was reduced and additional weight placed on tender submissions addressing:

- The extent of economic contribution to the Geelong Region
- How this innovation positioned the business in the market; How it would launch the business into a new market supply position
- Capability and experience, past performance over last 3 years in delivering projects related to bridge construction in general
- How does this innovation deliver benefits; How is this innovation unique

- What systems were in place for managing the Quality, Environment and Risk Management elements of such an innovative product to make sure it was delivered

Information was also sought from tenderers regarding their involvement in recent similar innovation projects as a guide to the ability to deliver on the proposal.

4.6 Awarded Design

After a robust assessment of the tenders received for delivering a 100-year maintenance free bridge, the contract was awarded to local manufacturer AustEng.

The proposed solution is a carbon fibre reinforced geopolymer concrete structure, locally manufactured and developed in conjunction with Deakin University and CSIRO's Carbon Nexus. The extent of innovation within the design is recognised by patents pending on the design.

Advantages identified within the design include addressing traditional steel reinforcement corrosion, higher reinforcement strength, acid and temperature resistance of geopolymer concrete and the ability of components to be manufactured in replicable segments.

With award costs lower than or comparable to traditional construction materials, the risk / reward for the bridge has proven the Procurement for Innovation process to be successful.

4.7 Ongoing Innovation

Since the awarding of the 100-year maintenance free bridge contract to AustEng further development potential for the product has been identified including alternative methods for bonding carbon fibre and the use of graphene for monitoring and thermal capture applications.

It is expected that with further development the use of carbon fibre reinforced geopolymer concrete for structural applications will become widespread.

5 Conclusions and recommendations

Procurement for Innovation is a proven method of bringing new products to market which have impact, are strategic and are replicable. The process bridges the barriers to innovation within the profit driven private sector and risk adverse public sector by providing certainty of the

products commercial value and viability as a solution to the defined need.

Through extending and slowing down the procurement process, Procurement for Innovation creates the time needed for development and testing of solutions to meet the unmet need. A well drafted specification which defines the challenge or unmet need to be responded to, but not the product to do it, enables true innovation to flourish resulting in the best products being delivered to market.

The Procurement for Innovation process has been successfully used by the City of Greater Geelong for the supply of a 100year maintenance free pedestrian bridge.

Further use of the Procurement for Innovation process provides an opportunity to test established practices and address the operating challenges being faced by governments.

Acknowledgements

In acknowledging the following people and organisations, the City of Greater Geelong would like to recognise the clever and creative thinking and efforts used to ensure our community-led vision is realised through this project.

Paul Taylor – Procurement Specialist – City of Greater Geelong. Providing ongoing advice to ensure the Procurement for Innovation process followed local government rules.

Barbara Morton - Sustainable Procurement Ltd, for international procurement and innovation perspectives and expertise, and for always asking the question 'But why?'

Cleantech Innovations Geelong Advisory Board members, for their open mindedness in accepting to support a project which had never been done in Australia before.

Commercialisation Filter Panel members, for their insights and enthusiasm in supporting a new way of doing things to benefit our community.

State Government Victoria – Department of Economic Development, Jobs, Transport and Resources / Department of State Development, Business and Innovation / Regional Development Victoria, for considering the inclusion of the Procurement for Innovation process as a valuable part of a wider program to develop markets for clean technologies, neither of which had been done in Victoria before.

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