



# Innovation Procurement Guide No. 3

## Guide to Evaluating Total Cost of Ownership

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# Introduction

Total Cost of Ownership can be used at various stages in procurement:

- when assessing different business models, maintenance options or solutions on a comparable cost basis;
- to understand the different cost drivers in the life of a procurement;
- by a Proponent when bidding for a contract to demonstrate the total benefits and value being offered – especially where the initial purchase price is higher than competitors, but the total cost of ownership is lower;
- to understand the best procurement option in terms of capital purchases vs. lease agreements;
- in selecting the best Proponent by assessing the comparative whole-of-life costs of competing proposals; and
- in managing the contract to track actual costs and benefits against budget as part of a benefits realisation exercise.

## **Purpose of this Guide**

This guide is intended as a resource tool to assist Healthcare Organizations in introducing the concept of Total Cost of Ownership or whole-life-cycle costs to be considered for inclusion in RFPs for innovative solutions. The guide, RFP template, and its corresponding agreement template, are available online at [www.hscn.org](http://www.hscn.org).

This guide is for Broader Public Sector (BPS) BPS Buyers, which refers broadly to any BPS Buyer (e.g. shared service organizations (SSOs), Local Health Integration Networks (LHINs), clinicians, administrators) using public funds to acquire innovative solutions (equipment, goods, and/or services).

This guide is intended as a reference guide only and does not replace the requirements described in the BPS Procurement Directive or your organization's own procurement policies and processes. It is intended to be a dynamic document and will be updated over time.

## **Approach & Methodology**

This guide is based on the results of the following activities:

- A review of a number of major publications from EU countries, addressing the key areas of innovation procurement;
- A cross-jurisdictional scan to understand the different initiatives around innovation procurement in Ontario and Canada; and
- A series of workshops with key stakeholders from different areas, such as shared services organizations (SSOs), group purchasing organizations (GPOs), Suppliers, and the Healthcare Supply Chain Network (HSCN).

## **Cautionary Statements**

This guide assumes that BPS Buyers and Healthcare Organizations are familiar with the original Common Tendering and Contracting Templates developed by HSCN – including the guides and annotations for those templates and, in particular, the Services RFP and Agreement templates. See those annotations and guides for additional assistance in completing the Innovation Services RFP Template and Innovation Services Agreement Template.

If you are uncertain about any part of the guide, and procurement documentation, or if the particular innovation procurement is relatively complicated, you should consult with the appropriate professional advisor.

Please read the terms upon which this guide is provided [www.hscn.org](http://www.hscn.org).

# Total Cost of Ownership

## Definition

Total Cost of Ownership (TCO) is an estimate of the total costs of solutions (equipment, goods, and/or services) over the whole of their life. It includes the purchase price or initial fees and all of the other costs a Healthcare Organization might incur, less any benefits received. For example, the TCO of medical equipment could include the initial purchase price, and the cost of installation, operation and ongoing maintenance, less the residual value upon disposal. TCO may also include non-quantifiable components, such as reduced patient wait times and physician time opportunity costs.

## Benefits of Total Cost of Ownership

The procurement principles outlined in the Broader Public Sector (BPS) Procurement Directive encourage public entities to make balanced procurement decisions, which include getting the best value for money. This involves accounting for all costs incurred and benefits received over the lifetime of a solution. A procurement decision based on the initial purchase price/fee only, rather than the total cost over the whole-life of the solution, could fail to recognise additional costs to the Healthcare Organization.

## Types and Models

BPS Buyers need to look beyond the purchase price/fee to identify all other costs and benefits over the life of the solution. However, as every procurement process is different, what needs to be included in the TCO calculation will vary on a case by case basis.

There are two broad types of costs:

1. **Direct costs** are attributed to a specific product. For example, in healthcare, the costs of the equipment, materials used, and labour cost associated.
2. **Indirect costs** are not attributed to a specific product. For example, in healthcare, these include rental equipment, taxes, maintenance of equipment.

Indirect costs may be further broken down into:

- fixed costs (rent, insurance premiums, salaries); and
- variable costs (electricity, and other non-operational consumables overtime)

## **Request for Total Cost of Ownership**

An effective way to get detailed TCO information is to require Proponents in the RFP to prepare and submit a TCO for their solution as part of their bid. Attaching a standard model TCO spreadsheet to the RFP for Proponents to complete (*see the TCO calculator section of this guide*) will make it easier both for Proponents to compile the information and for BPS Buyers to compare the submitted proposals.

However, in so doing BPS Buyers should:

- Share needs in the early market engagement<sup>1</sup> discussions with Proponents;
- Detail the Health Organization's needs so that Proponents can produce accurate TCO information that is tailored to meet them;
- Give Proponents sufficient time to prepare detailed and comprehensive TCO calculations, that are critical to the decision making process; and
- Be prepared to answer Proponents' questions about the TCO and ensure that all Proponents are provided with the same information at the same time.

## **Quality Considerations**

The quality of a solution may have a considerable impact on the overall cost of ownership. Regular repairs or maintenance may add to the overall cost, and may lower productivity until the item is fixed. When a piece of equipment, device or service is critical to the core operation of the Healthcare Organization, an outage may prevent staff from performing their work. The quality of the item may also impact on its longevity; as a higher quality product may last longer than one of poorer quality. The cost of solutions with longer life spans may be spread out over more years.

## **Calculating the Total Cost of Ownership**

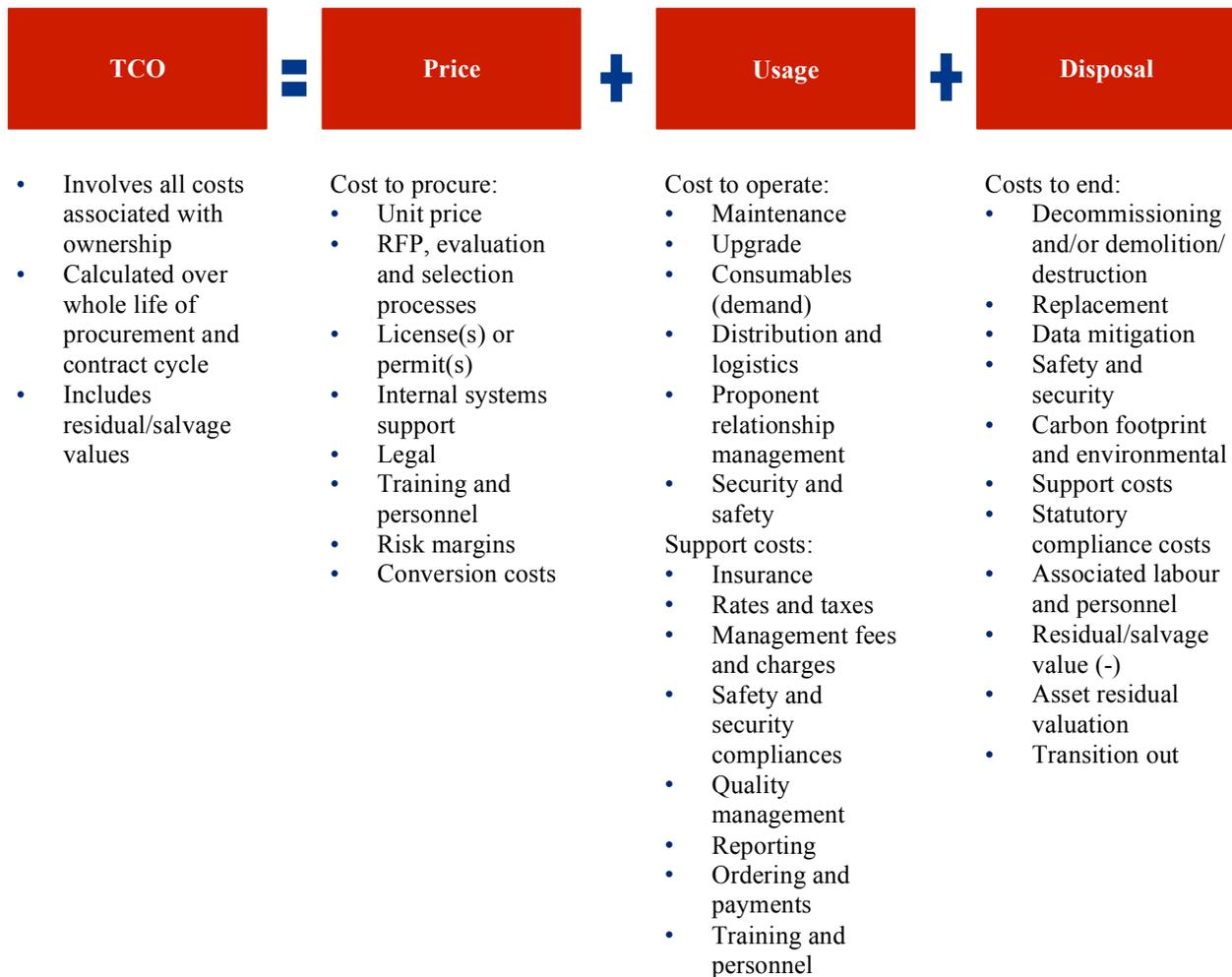
Calculation of the TCO involves a 'whole-of- life' analysis that includes the accumulated costs of acquiring, operating, maintaining and disposing or decommissioning procured equipment or goods, including benefits from disposal.

There is no standard formula to be used for all TCO calculations. Instead, what is included will depend on the specific nature of the procurement. The following example demonstrates a formula that illustrates some key elements of TCO:

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<sup>1</sup> Early market engagement (EME) encourages Proponents to get ready to meet demand as Broader Public Sector (BPS) entities forecast needs that aim to improve public services. Early market engagement provides detailed understanding of BPS entities' requirements and the market likely responses.

**Figure 1 – Total Cost of Ownership Standard Formula**



There are a number of ways (or metrics) that may be used to analyse cash flow to calculate TCO, including net present value (NPV), return on investment (ROI), and internal rate of return. These metrics are most applicable to procurement categories assessed as high risk/high value with a focused or level of complexity, which also require specialist capability.

When calculating TCO, BPS Buyers may need to take into account what money will be worth at the future time that they need to pay it out. The formula to calculate the value of money in a given time is as follows:

### **Time value of money**

The time value of money (TVM) is the value of a sum of money taking into account the amount of interest that it could earn over a period of time.

$$\text{Future Value} = \text{Present Value} * (1 + \text{Discount/Interest Rate})^{(\text{Number of years})}$$

## Present value

Present value is the value of a sum of money at the present time, in contrast to some future value it will have when it has been invested. The formula to calculate present value is as follows:

$$\text{Present Value} = \text{Future Value} / (1 + \text{Discount/Interest Rate})^{(\text{Number of years})}$$

## Possible Cost Categories Used in TCO

There are common concepts and cost categories used to describe different types of costs and benefits that can be taken into account when calculating a TCO. As an example, we have listed common categories, mostly applicable to equipment purchases, in the following table:

Figure 2 – Total Cost of Ownership Cost Categories Example

Cost Category	Description
Initial Costs (one-time)	<ul style="list-style-type: none"><li>• The purchase cost and other related initial costs such as:<ul style="list-style-type: none"><li>○ pilot/development</li><li>○ initial licensing</li><li>○ legal costs</li><li>○ packaging and delivery</li><li>○ deployment, installation and testing</li><li>○ conversion costs (from incumbent or other)</li><li>○ Alterations to a building or room within a hospital</li></ul></li></ul>
Operating Costs	<ul style="list-style-type: none"><li>• Consumables such as medical paper, apparel, safety, etc.</li><li>• Labour associated to the service provided, and maintenance of equipment</li><li>• Utilities and services</li><li>• Rental of space</li></ul>
Preventive Maintenance	<ul style="list-style-type: none"><li>• Maintenance conducted to keep equipment working and/or extend the life of the equipment. This includes scheduled overhaul of the equipment or scheduled replacement of parts.</li><li>• Costs may include labour, spare parts and consumables. Indirect costs may include loaners or replacement equipment.</li></ul>
Technology Refresh	<ul style="list-style-type: none"><li>• Technology Refresh is the adoption of newer technology to meet changing needs or to reduce the risks created by outdated technology. It may include:<ul style="list-style-type: none"><li>○ upgrading existing systems</li><li>○ adding new technology to the system</li><li>○ replacing custom-built or off-the-shelf system components</li><li>○ disposing of any obsolete components</li></ul></li><li>• Costs may include the cost of the replacement equipment, installation and testing. For example, upgrading software may need system/data storage changes.</li></ul>

Cost Category	Description
Training & Education	<ul style="list-style-type: none"> <li>• In many circumstances, for example, the installation of new equipment or software, staff must be trained in how to use it and administer it. Training costs may relate to:               <ul style="list-style-type: none"> <li>○ developing the training module</li> <li>○ printing materials, such as workbooks and job aids</li> <li>○ purchasing equipment, ranging from data-shows to computers</li> <li>○ contracting for a trainer</li> <li>○ hiring a venue</li> <li>○ providing refreshments, meals, and transport</li> <li>○ replacing staff while they are away from their usual duties</li> </ul> </li> </ul>
Resale Value	<ul style="list-style-type: none"> <li>• When a product is taken out of use, there may be a resale or salvage value.</li> </ul>
Disposal Cost	<ul style="list-style-type: none"> <li>• When an item comes to the end of its useful life there may be costs associated with its disposal (e.g. disposing of hazardous items).</li> </ul>
Minor Corrective Maintenance	<ul style="list-style-type: none"> <li>• Corrective maintenance consists of activities that are carried out to identify and repair a fault so that the failed equipment, machine or system can be returned to its usual working state.</li> <li>• Minor corrective maintenance usually takes the form of spare parts that are on hand or are easy to install. If the equipment is covered by a service contract, these parts are usually included.</li> <li>• Usually, minor corrective maintenance would be less than 5 percent of the value of the equipment.</li> <li>• Minor corrective maintenance should be expected and accounted for in the maintenance budget.</li> </ul>
Major Corrective Maintenance	<ul style="list-style-type: none"> <li>• Major corrective maintenance is unexpected and needs a financial and operational decision about whether or not to repair the item.</li> <li>• Major corrective maintenance usually falls in the range of 6 percent to 50 percent of the value of the equipment.</li> <li>• An outage that requires major corrective maintenance usually results in significant downtime. For critical equipment, this could have an impact on the financial operation or service levels of the facility.</li> </ul>

# Quick Calculator

The TCO calculator included in this guide is intended to be an example of the various components to be considered when calculating the whole-of-life cost of a solution.

## Total Cost of Ownership - Quick Calculator



Name of product (equipment / goods/ service):

Expected lifetime of the item:

EXPENSES		enter data here	enter data here	this column automatically calculates
Cost category 1	Cost items	unit cost	qty	subtotal costs \$
All initial costs on purchase (one-off)	Unit Price (Tax Included)			\$0.00
	Accessories			\$0.00
	Packaging			\$0.00
	Delivery costs			\$0.00
	Installation / integration / engineering / calibration costs			\$0.00
	Testing / initial inspection costs			\$0.00
	<b>subtotal</b>			<b>\$0.00</b>
Cost category 2	Cost items	unit cost	qty	subtotal costs \$
Regular ongoing operational costs (per annum)	Annual licences			\$0.00
	Consumables 1 e.g. disposables			\$0.00
	Consumables 2 e.g. cleaning products			\$0.00
	Consumables 3 e.g. health and safety equipment			\$0.00
	Consumables 4 e.g. paper			\$0.00
	Software & hardware upgrades			\$0.00
	Staff training			\$0.00
	<b>subtotal</b>			<b>\$0.00</b>
Cost category 3	Cost items	unit cost	qty	subtotal costs \$
Regular service and maintenance (per annum)	Annual maintenance - Service Contract			\$0.00
	Preventative maintenance - Service Contract			\$0.00
	Labour Only			\$0.00
	Other maintenance			\$0.00
	Spare parts			\$0.00
	Hire of replacement equipment during downtime			\$0.00
	Costs associated with additional work requested			\$0.00
	Overtime costs			\$0.00
	Equipment Refresh – Evergreen Programs			\$0.00
	Supplier travel and accommodation costs			\$0.00
	<b>subtotal</b>			<b>\$0.00</b>
Cost category 4	Cost items	unit cost	qty	subtotal costs \$
Fuel / energy costs (per annum)	Electricity			\$0.00
	Gas			\$0.00
	Water			\$0.00
	<b>subtotal</b>			<b>\$0.00</b>
Cost category 5	Cost items	unit cost	qty	subtotal costs \$
Anticipated downtime (per annum)	Planned maintenance outages - additional costs			\$0.00
	Unplanned outages - additional costs			\$0.00
	Unplanned outages - lost revenue			\$0.00
	<b>subtotal</b>			<b>\$0.00</b>
Cost category 6	Cost items	unit cost	qty	subtotal costs \$
Disposal costs (one-off not per annum)	Decommissioning / deconstruction costs			\$0.00
	Cost of transportation of equipment from site			\$0.00
	Disposal costs e.g. hazardous items			\$0.00
	Restoration of site to original state			\$0.00
	Write-off			\$0.00
	<b>subtotal</b>			<b>\$0.00</b>
<b>INCOME</b>				
Income on disposal (one-off not per annum)	Income items	unit cost	qty	subtotal costs \$
	Trade-in value			\$0.00
	Resale / salvage value of equipment			\$0.00
	Resale / salvage value of parts			\$0.00
	Resale / salvage value of operational items (e.g. consumables)			\$0.00
	<b>subtotal</b>			<b>\$0.00</b>

# TCO Calculator



TCO Calculator  
08052014.xlsx

# References

1. Office of Government Commerce, the UK. *Finding and Procuring Innovative Solutions*
2. Edquist-Zabala, Sweden, *Public Procurement for Innovation (PPI) as Mission-oriented Innovation Policy*
3. New Zealand Government, *An introduction to whole-of-life costing*
4. Office of Government Commerce, the UK, *Capturing Innovation*

