

## Whole-of-Life Costing Guideline

### Purpose

Achieving value for money (VFM) is a key principle of the South Australian Government's Procurement Framework. The Procurement Governance Policy identifies that VFM is achieved in procurement by finding the optimum balance between whole-of-life cost and quality.<sup>1</sup>

This Guideline provides practical guidance for South Australian public authorities on how to use and calculate whole-of-life costing in procurement.

### What is whole-of-life costing (WLC)?

WLC (also commonly referred to as life cycle costing or total cost of ownership) is a method of estimating the total costs of goods or services (the supply) over the whole of their life. It combines the estimated costs of acquisition, operation, maintenance support, and disposal or decommissioning of the supply (less any income or revenue it receives).

WLC helps public authorities better understand their budget requirements to cover all expenses associated with the procurement, not just the initial purchase price. Considering WLC enables informed decision making from the outset, and often leads to a more comprehensive assessment of value for money.

The concept of WLC in procurement is often easy to understand in terms of goods, such as buying cars or leasing printers. However, it can also apply to services such as a building maintenance agreement or providing training as well as services for clients and communities. For services, costs such as overtime, staff training and administrative overheads should be considered when evaluating an offer and comparing in-house costs against those of engaging an external provider.<sup>2</sup>

At times, multiple separate procurement processes may be required under the one project in order to achieve all the required outcomes. In these cases, it is useful to consider the total WLC of the project when assessing need, benefits and risks.

A procurement decision based on the initial purchase price only, rather than the total costs over the lifespan of the asset or project, could fail to recognise the real costs to the public authority, meaning that these costs cannot be planned for, minimised or avoided.

### When should WLC be used?

WLC can be used at various stages in a procurement process, including:

- in the initial business case to assess the costs, benefits and risks associated with the procurement

<sup>1</sup> Appendix 1 of the *Procurement Governance Policy* provides further detail about how the government defines and achieves VFM in procurement.

<sup>2</sup> "Whole life costing", Procurement, University of Reading, UK

## Whole-of-Life Costing Guideline

- 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
- managing the contract to track actual expenses and income against budget
- to reassess the complexity of the procurement
- as part of a benefits realisation exercise.

Public authorities should consider where using WLC may or may not be appropriate.

### Estimating the cost of a supplier's offer

Goods and services can have differing cost patterns or elements depending on the supply and the supply market. For example, some goods may have a higher energy consumption rating, licencing and registration requirements, require regular servicing, require a training program to operate, or have more expensive costs associated with their disposal. In some cases, different supplier offers will have budgeting implications beyond the initial purchase price which need to be considered before a supplier is selected.

It is important that the identified WLC for a supplier's offer is within the public authority's approved budget for the procurement before a preferred offer/supplier is recommended.

### Calculating whole-of-life costs



### What is included?

When calculating the whole-of-life cost of a good or service, WLC should include:

- **Up-front acquisition costs** – the initial cost of obtaining the goods (e.g. the purchase price, design, planning, freight, installation and initial training costs) or establishing a new service (e.g. licenses, initial onboarding and staff training, office set-up and fit-out).
- **Lifetime operating costs** – the costs incurred during the life of the goods (e.g. energy consumption, quality and safety, distribution and logistics) and contract term for the services (e.g. supplier staff wages, transport costs, program materials, automatic cost of living increases and indexation).
- **Lifetime maintenance and support costs** – the costs incurred in maintaining the dependability of the goods and services during their life (e.g. supplier administration costs, consumables, spare parts, minor repairs or labour, refresher training for staff).
- **Disposal costs** – the costs of removing or disposing of a good after its economic life has ended (e.g. costs to transfer ownership, trade-in, auction or recycle) or

## Whole-of-Life Costing Guideline

transitioning/closing-out a service.

### What is excluded?

When calculating the whole-of-life cost of a good or service, WLC should exclude<sup>3</sup>:

- Depreciation (this is an accounting allocation of capital costs over the life cycle of the good). Including depreciation in the calculation would double count those capital costs.
- Capital charge (the opportunity cost of capital is taken into account in the discount rate used in the present value calculation).
- Costs that will be incurred regardless of the procurement or offer selected, e.g. corporate overheads.
- FTE costs of existing staff members (e.g. existing staff who are contract managers) should not be included unless the FTE is engaged as a direct requirement of the procurement.
- For services, the cost of previous contracts for service establishment and/or delivery.

### Identifying the whole-of-life

WLC calculations aim to identify all the obvious and hidden costs across the full ownership life or life cycle of the supply. However, there is often room for judgement and sometimes different opinions in deciding what is the appropriate lifespan to analyse.

Different methods can be used to identify the appropriate lifespan. However, for a consistent approach across government, it is recommended that public authorities use the 'service life' (or 'operational life') of the supply when calculating the whole-of-life cost. For goods, this may consider the number of years the goods will be operational and fit-for-purpose. For services, this is likely to consider the contract term (i.e. the number of years the service will be contracted by the public authority as a result of the procurement process).

### Identifying cost elements

To identify the costs and benefits associated with a procurement, the public authority should work through the whole of the life of the supply, and consider when a cost or benefit may occur, and estimate the value. Some costs may be one-off, others may be recurring – so it is important to know how many years the public authority intends to use the product, equipment or services. In some cases, there may be some residual value in the equipment or parts e.g. selling generators, IT or plant equipment. However, there can also be costs associated with disposal or decommissioning.

The columns below provide examples of the types of cost elements that may apply during the life of a supply. This is not an exhaustive list. The costs to be considered in WLC will vary depending on the good or service.

<sup>3</sup> 'Whole of life Costs', New Zealand Government, Treasury

# Whole-of-Life Costing Guideline

Acquisition	Operation	Maintenance and Support	Disposal / Decommissioning
<ul style="list-style-type: none"> <li>Unit price</li> <li>License/s or permit/s</li> <li>Demand management planning</li> <li>Training and personnel</li> <li>Delivery charge</li> <li>Installation and commissioning</li> <li>Customisation</li> <li>External consultants or technical experts</li> <li>Legal</li> <li>Internal (transition) costs associated with changing from the incumbent supplier (which should be identified prior to tenders being received)</li> </ul>	<ul style="list-style-type: none"> <li>Labour</li> <li>Reviews</li> <li>Maintenance</li> <li>Upgrade</li> <li>Demand management</li> <li>Distribution and logistics</li> <li>Security</li> <li>Health and safety</li> <li>Materials</li> <li>Cost of change (e.g. decision to use alternative materials)</li> <li>Travel and fuel</li> <li>Energy supply and consumption</li> <li>Water</li> <li>Transaction costs</li> </ul>	<ul style="list-style-type: none"> <li>Consumables</li> <li>Insurance and taxes</li> <li>Management fees and charges</li> <li>Safety and security compliances</li> <li>Quality management</li> <li>Reporting</li> <li>Ordering and payments</li> <li>Training and personnel</li> <li>Specialist labour or tooling</li> <li>Spare/ replacement parts</li> <li>Servicing and inspection regimes</li> <li>Costs associated with equipment downtime</li> </ul>	<ul style="list-style-type: none"> <li>Safe disposal</li> <li>Decommissioning, demolition or destruction</li> <li>Data migration / file archiving</li> <li>Safety and security</li> <li>Statutory compliance</li> <li>Associated labour and personnel</li> <li>Auctioneers or agent fees</li> <li>Ongoing liabilities</li> <li>Asset residual valuation</li> <li>Reinstatement of land or buildings for alternative use</li> <li>Transition out</li> </ul>

It is not expected that all cost categories or elements will be applicable to all procurements. It is up to the public authority to consider what is relevant and applicable to the good or service being procured based on its understanding of the business, client or community need and supply market analysis. These cost elements can also be identified and estimated through industry engagement and supply market analysis, analysis of historic data or previous usage patterns, the advice of experts or industry sources, or advice and data from manufacturers or suppliers.

Public authorities should ensure that the cost estimates and life cycle assumptions used in the WLC calculation are evidence-based, documented and consistently applied throughout the public authority.<sup>4</sup>

Example 2 of Attachment 1 provides a case study to demonstrate how identifying all potential cost elements can be used in the value for money assessment.

### Estimating the value of each cost and benefit

Each cost element is to be defined, with an estimated value, for a defined number of years in which the costs are expected to be incurred. Each cost element can then be added together to determine the total costs over the life of the supply.

The time spent on estimating the cost is to be commensurate with the complexity, risk profile and value of the procurement.

### Discount future costs (if applicable)

While most acquisition costs are generally incurred in year 0 of the life of the supply, operating and maintenance costs usually extend into the future. Discounting anticipated future costs by applying an appropriate discount rate enables all costs to be reflected back to their net present value (NPV). Discounting future costs to a NPV allows meaningful comparison of supplier offers with different future costs.

NPV illustrates that even though a good or service can deliver profit it does not mean that it is a good investment for the public authority.

While it is relatively simple to establish the acquisition costs or initial purchase price of a good, it can be more difficult to estimate the operational, maintenance and

<sup>4</sup> 'Whole of life Costs', New Zealand Government, Treasury



## Whole-of-Life Costing Guideline

disposal costs incurred during its life. Similarly, choosing the 'correct' discount rate can be equally contentious. The discount rate is usually a combination of the current long-term expected interest rate minus the current long term expected inflation rate. However, it is important that specialist financial advice be sought before a particular discount rate is adopted. Example 1 of Attachment 1 provides a case study to demonstrate how NPV can be calculated and used in the value for money assessment.

Department of Treasury and Finance, Commercial and Economics Branch can ALSO advise on the appropriate discount rate. The Commercial and Economics Branch can be contacted at [DTFCommercialEconomics@sa.gov.au](mailto:DTFCommercialEconomics@sa.gov.au).

### Whole-of-Life Cost v Contract Value

It is important to note that the whole-of-life cost of a supplier's offer may be different from the resulting contract value. The whole-of-life cost takes into account the total costs associated with a supplier's offer including the cost of acquisition, operation, maintenance and support, and disposal or decommissioning of the supplier's proposed solution. However, the resulting contract for the supply of the goods or services, may not include provisions for the maintenance, support or disposal of the contracted goods or services. It is possible (and quite common) that maintenance and disposal of a particular good or service will be managed through a separate process, contract and/or different supplier.

For the purpose of [Treasurer's Instruction 8](#), the contract value should only include:

- the value committed to,
- expenditure incurred, or
- the potential expenditure to be incurred

by the public authority under a specific contract with a supplier.

The contract value should not include other cost elements included in the WLC that will not be incurred under the applicable contract.

If a procurement results in multiple contracts, then the total contract value of the procurement will be the sum of each individual contract value.

### References

This guideline has been adapted and modelled on the documents listed below:

1. 'Whole of life Costs', New Zealand Government, Treasury (available at: <https://www.treasury.govt.nz/sites/default/files/2015-07/lifecosts-guidance.pdf>)
2. 'Total Cost of Ownership: An Introduction to whole-of-life costing', Government Procurement Branch, New Zealand (Ministry of Business, Innovation & Employment) (available at: <https://www.procurement.govt.nz/assets/procurement-property/documents/guide-total-cost-ownership.pdf>)
3. 'Achieving value for money – procurement guide', State of Victoria 2018 (available at: <https://www.buyingfor.vic.gov.au/achieving-value-money-goods-and-services-procurement-guide#tools-and-support> )

References have been licensed under a Creative Commons Attribution 4.0 Australia Licence and the Creative Commons Attribution-Noncommercial-Share Alike 3.0 New Zealand License. For licence conditions see: <https://creativecommons.org/licenses/by/4.0> and <http://www.creativecommons.org.nz>

# Whole-of-Life Costing Guideline

## Attachment 1 Whole-of-life Costing Case Studies

The following examples illustrate how WLC can be calculated and operate in practice.

### Example 1: Purchase of a new hot water unit

This example uses the purchase of a new hot water unit and compares two options (A and B). In this example, the purchase price and installation costs are included as an initial one-off cost, with other costs, such as service costs and energy consumption, occurring annually until the end of the estimated life of the goods.

The discount rate used to illustrate this case study is 10%. Each cost from year one to six has been discounted according to the number of years that will have elapsed since year 0.

Year 0's multiplier rate is 1. Each subsequent year's multiplier rate can be calculated as follows:

$$\text{Multiplier Rate} = 1 / (1 + dr)^y$$

where: dr = the discount rate per year (expressed as a decimal percentage)

y = raised to the power of the year being considered (year 1=1, year 2=2 etc)

*E.g. Multiplier rate for year 2 = 1 / (1 + 0.1)<sup>2</sup> = 0.83*

The example shows that the cost structure and effect of discounting enables a meaningful comparison between the two options, regardless of the varying costs. The example shows that although the initial purchase price of Option A is less than Option B, the total whole-of-life costs indicates that Option B presents better value for money.

#### Hot Water System Option A:

Cost Element/Cost Category	Totals (\$000)	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
<i>Multiplier Rate</i>		1.0	0.91	0.83	0.75	0.68	0.62	0.56
<b>1 Acquisition Costs</b>								
Purchase Price	45	45						
Installation	5	5						
<b>2 Lifetime Maintenance Costs</b>								
Annual service	28	4	4	4	4	4	4	4
Programmed maintenance	6			6				
<b>3 Lifetime Operating Costs</b>								
Energy Consumption	14	2	2	2	2	2	2	2
<b>4 Disposal Costs</b>								
Removal of Unit	10							10
<b>5 Income from Residual Value</b>								
Scrap metal value only	(1)							(1)
<b>TOTALS</b>	<b>107</b>	56	6	12	6	6	6	15
<b>Net Present Value</b>	<b>92.12</b>	56	5.46	9.96	4.5	4.08	3.72	8.4

- The residual value amount is treated as a negative for the purpose of calculating the total (\$1K in year 6).
- The total (\$107K) is calculated by adding up each of the individual yearly totals. This total can be validated by adding up the amounts for each item listed in the row above.
- Individual NPV amounts are calculated by multiplying the individual year total by the

## Whole-of-Life Costing Guideline

multiplier rate (e.g.  $12 \times 0.83 = 9.96$  for year 2).

- The NPV total is calculated by adding up each of the individual yearly totals (92.12).

Hot Water System Option B:

Cost Element/Cost Category	Totals (\$000)	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
<i>Multiplier Rate</i>		1.0	0.91	0.83	0.75	0.68	0.62	0.56
<b>1 Acquisition Costs</b>								
Purchase Price	58	58						
Installation	10	10						
<b>2 Lifetime Maintenance Costs</b>								
Annual service	14	2	2	2	2	2	2	2
Programmed maintenance	3			3				
<b>3 Lifetime Operating Costs</b>								
Energy Consumption	7	1	1	1	1	1	1	1
<b>4 Disposal Costs</b>								
Removal of Unit	5							5
<b>5 Income from Residual Value</b>								
Scrap metal value only	(1)							(1)
<b>TOTALS</b>	<b>96</b>	71	3	6	3	3	3	7
<b>Net Present Value</b>	<b>88.78</b>	71	2.73	4.98	2.25	2.04	1.86	3.92



## Whole-of-Life Costing Guideline

### Example 2: Purchase to replace an existing CRM Platform

This example uses the purchase to replace an existing Customer Relationship Management (CRM) platform and compares two options (A and B).

In this example, the external resources used to develop the scope and market documentation as well as the platform design, build and costs for transitioning in a new supplier and platform are included as an initial one-off cost, with other cost such as licensing and hosting, occurring annually until the end of the estimated life of the system.

No discount rate used in this case study.

The example shows that the cost structure and consideration of the operational life of the platform including resourcing and on-going costs enables a meaningful comparison between the two options, regardless of the varying costs.

The example shows that although the initial purchase price of Option A is less than Option B, the total whole-of-life costs indicates that Option B presents better financial value.

#### CRM Option A:

Cost Element/Cost Category	Totals (\$000)	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
<i>Multiplier Rate</i>								
<b>1 Acquisition Costs</b>								
External contractor for development of scope and procurement documentation.	<b>40</b>	40	0	0	0	0	0	0
Platform design	<b>60</b>	60	0	0	0	0	0	0
Platform build including: <ul style="list-style-type: none"> <li>• Technical services</li> <li>• Project management</li> <li>• User documentation</li> </ul>	<b>180</b>	180	0	0	0	0	0	0
Hardware & hosting establishing costs	<b>80</b>	80	0	0	50	0	0	0
Transition in including <ul style="list-style-type: none"> <li>• Training</li> <li>• Data migration</li> <li>• Change management</li> </ul>	<b>50</b>	50	0	0	0	0	0	0
<b>2 Lifetime Maintenance Costs</b>								
System enhancements	<b>160</b>	0	25	26	26	27	28	28
Support & maintenance	<b>255</b>	0	40	41	42	43	44	45
<b>3 Lifetime Operating Costs</b>								
Hosting	<b>77</b>	0	12	12	13	13	13	14
Licensing	<b>255</b>	0	40	41	42	43	44	45
New FTE to support system/users	<b>639</b>	0	100	103	105	108	110	113
<b>4 Disposal Costs</b>								
Transition out including: <ul style="list-style-type: none"> <li>• Service provider handover</li> </ul>	<b>20</b>	0	0	0	0	0	0	20
Hardware disposal	<b>4</b>	0	0	0	2	0	0	2
<b>TOTALS</b>	<b>1820</b>	410	217	223	280	234	239	267

# Whole-of-Life Costing Guideline

## CRM Option B:

Cost Element/Cost Category	Totals (\$000)	Yr 0	Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6
<i>Multiplier Rate</i>								
<b>1 Acquisition Costs</b>								
External contractor for development of scope and development of procurement documentation.	40	40	0	0	0	0	0	0
Platform design	80	80	0	0	0	0	0	0
Platform build including: <ul style="list-style-type: none"> <li>Technical services,</li> <li>Project management</li> <li>User documentation</li> </ul>	220	220	0	0	0	0	0	0
Hardware & hosting establishing costs	80	80	0	0	0	0	0	0
Transition in including <ul style="list-style-type: none"> <li>Training</li> <li>Data migration</li> <li>Change management</li> </ul>	110	110	0	0	0	0	0	0
<b>2 Lifetime Maintenance Costs</b>								
System enhancements	160	0	25	26	26	27	28	28
Support & maintenance	255	0	40	41	42	43	44	45
<b>3 Lifetime Operating Costs</b>								
Hosting	138	0	22	22	23	23	24	24
Licensing	315	0	50	51	52	53	54	55
New FTE to support system/users								
<b>4 Disposal Costs</b>	00	0	0	0	0	0	0	0
Transition out including: <ul style="list-style-type: none"> <li>Service provider handover</li> </ul>	5	0	0	0	0	0	0	5
Hardware disposal	00	0	0	0	0	0	0	0
<b>TOTALS</b>	<b>1403</b>	530	137	140	143	146	150	157

