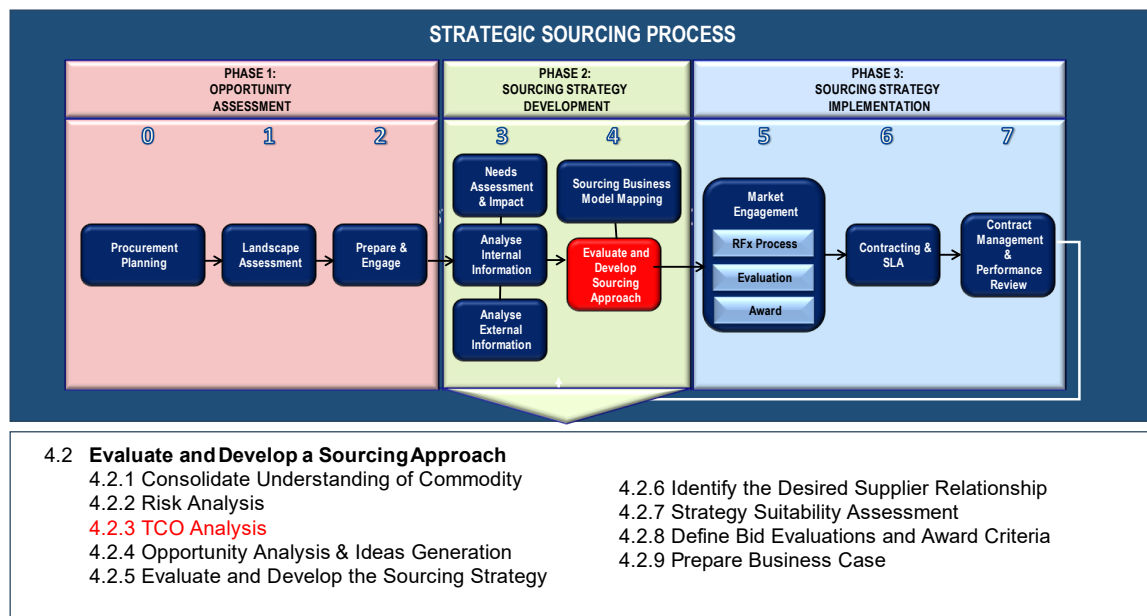


Using this guide

This guide accompanies the National Treasury's Strategic Procurement Framework (SPF) for Strategic Sourcing in the Public Sector. For more information, visit the National Treasury website at <http://ocpo.treasury.gov.za/>. The SPF can be found here: http://ocpo.treasury.gov.za/Resource_Centre/Documents/1A.%20Strategic%20Procurement%20Framework.pdf

TOTAL COST OF OWNERSHIP (TCO) ANALYSIS



1.0 Introduction

- i. Total Cost of Ownership (TCO) is an estimate of the total costs of goods, services or construction works over the whole of their life.
- ii. The following good practice guides apply to this stage of TCO analysis;
 - a. What is the Total Cost of Ownership and why it is important?
 - b. Price and cost analysis
 - c. When to use TCO
 - d. Total cost of ownership framework
 - e. Components that contribute to TCO

- f. Addressing opportunities identified from TCO analysis

1.1 The objective

- i. To determine the direct and indirect costs of a product or service over its full life cycle (from procuring, installing, deploying, operating, upgrading, maintaining and disposal).

1.2 The output

- i. Estimated total cost of ownership calculation

2.0 Good practice guides

2.1 What is the Total Cost of Ownership and why it is important?

- i. It is a financial estimate that helps the organisation to determine the direct and indirect costs of a product, service or system.
- ii. The analysis goes beyond the initial purchase price or implementation cost, It considers the full cost of an asset over its useful life.
- iii. It's the combination of the purchase price plus all other costs you will incur, less any income you receive to offset the costs incurred.
- iv. For example: the initial purchase price plus installation costs, operating costs and ongoing maintenance less the residual value on disposal.
 - a. The following example is based on the study conducted by Tesla.
 - b. It shows a 5-year cost of ownership study comparing a Tesla Model 3 to a Toyota Camry and an Audi.

5 Year Cost of Ownership



Tesla Model 3



Toyota Camry LE



Audi A5

	Tesla Model 3	Toyota Camry LE	Audi A5
Purchase Price	\$38,900	\$24,600	\$44,200
Financing	\$2,765	\$486	\$3,180
Tax, Title and License	\$3,025	\$2,050	\$5,405
Insurance	\$5,640	\$6,060	\$8,080
Fuel/Electricity	\$2,250	\$8,140	\$9,910
Maintenance/Repairs	\$1,200	\$4,000	\$8,000
Total	\$53,780	\$45,336	\$78,775
Resale Value	(\$18,988)	(\$8,905)	(\$18,564)
Total	\$34,792	\$36,431	\$60,211
Cost Per Mile	\$0.46	\$0.49	\$0.80

<https://deepwatermgmt.com/tesla-model-3-cost-of-ownership-slightly-cheaper-than-a-camry/>

Figure 1: TCO Analysis Example of purchasing a vehicle

Why is TCO important?

- i. If properly applied, it helps to make informed and balanced procurement decisions.
 - a. This includes getting the best value for money.
 - b. It means accounting for all costs and benefits over the lifetime of the goods or services.
- ii. It helps you to achieve the 5Rs in procurement (Right price, right quality, right place, right quantity and right time).
- iii. A procurement decision based only on the initial purchase price, rather than the total costs over the whole of life, could fail to recognise the real costs to your department.

2.2 Price and Cost Analysis

- i. The TCO also involves the price and cost analysis of the commodity.

2.2.1 Price analysis techniques

- i. Some type of cost analysis is required with any purchase of goods or services, including sole source items.

- ii. A part of this analysis is the verification of pricing.
- iii. There are many ways to analyse the pricing of a product or service.
- iv. Some of the techniques recommended include:

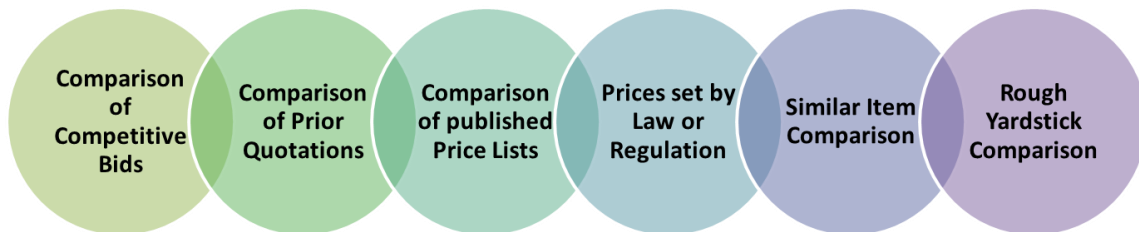


Figure 2: Price Analysis Techniques

2.2.1.1 Comparison of competitive bids

- i. This is one of the best ways to validate price.
- ii. By asking three or more suppliers for their prices for the same product, one can determine if a particular price is reasonable.
- iii. However, this does not exclude total cost analysis.
- iv. The lowest bid may not always represent the lowest cost.
- v. The total cost of acquisition must be analysed.
- vi. There may be costs associated with making the lower-cost product perform to standards, the additional cost of early replacement or the cost of redesign and/or testing required to make the lower-cost product applicable.
- vii. This "total cost of acquisition" is the real cost that must be compared.

2.2.1.2 Comparison of Prior Quotations

- i. In some circumstances, it may be more effective to compare recent quotations (within the past 24 months) for the same product or service to determine the viability of the current quotation.
- ii. This is particularly helpful when the timing of the acquisition is critical and competitive quotes need to be obtained and processed quickly.

2.2.1.3 Comparison of published price list

- i. This method should only be used for materials that are sufficiently similar to items or services that are available to the general public and whose price would appear in a published price list.
- ii. However, when comparing these price lists, it is important to consider standard industry discounts for the items or services.
- iii. As an example: Many electrical supply houses provide standard discounts to customers who make purchases of a certain value or quantity.
- iv. Such discounts must be considered when comparing list prices and also noted in the procurement documentation.

2.2.1.4 Prices set by law or regulation

- i. In some cases, prices are determined by laws or regulations.
- ii. When this happens, there is typically a document, like a "pronouncement," that outlines the pricing structure.
- iii. It's important to consult this document when procuring these items.
- iv. Fuel prices are an example of this type of regulated pricing.

2.2.1.5 Similar item comparison

- i. When an item or service is fairly unique, it is possible to compare items that are similar to those being purchased.
- ii. A statement as to why the common item will not meet the specification should accompany the price comparison.

2.2.1.6 Rough estimate comparisons

- i. This technique uses a rough comparison between like items based on measurable similarities, such as price per kilogram, cost per litre or price per test sample. It is good practice to attach an explanation of the similarities and assumptions to this analysis.
- ii. If it is difficult to find comparable items or services, it may be necessary to rely on a cost analysis.

- iii. While time-consuming, this is the best method to use when validating prices for complicated sole-source items.
- iv. In cost analysis, the supplier of the goods or services is asked to provide:
 - v. List of materials and their cost.
 - vi. Number and kinds of labour hours required.
 - vii. Any special tooling and facilities proposed.
 - viii. A reasonable plan for the use and disposal of scrap.
 - ix. Any other cost, including profit, relevant to the cost of providing the service or item.
- i. Each item on the supplier's bill of materials is then analysed using the techniques already discussed.
 - ii. Negotiation of variables such as overhead and profit can occur as well.
 - iii. The exercise must be documented.

2.2.2 What is cost analysis?

- i. Cost analysis is the element-by-element examination of the estimated or actual cost of the item (e.g., labour, materials, etc.) that make up a supplier's total cost proposal or price to determine if they are allowable, directly related to the requirement and ultimately, reasonable.
- ii. The goal is to form an opinion on whether the proposed costs are in line with what reasonably economical and efficient performance should cost.
- iii. Cost analysis involves determining the direct (traceable) and indirect (non-direct expenses) costs that make up the purchase price.
- iv. When conducting a Cost analysis, keep the following in mind:
 - v. It is useful when the item cannot easily be compared or is considered "unique".
 - vi. When asking for this information, convince your supplier that your intent in obtaining costing information is not to reduce their profit.
 - vii. It assists in understanding the cost drivers behind the product/service.
 - viii. Identify direct costs (costs directly attributable to the final product):
 - ix. For example: base salary, labour, fringe benefits, materials, transport, warehousing

- x. Identify indirect costs (costs that are not directly associated with the final product):
- xi. For example: advertising and marketing, legal fees, travel, rent, office supplies, insurance, taxes, utilities, depreciation, overheads.
- xii. Profit is usually included in both the direct and indirect costs.
- xiii. It represents the complexity of the work done and the risk taken while performing the work.
- xiv. As with price analysis, after establishing a rate, negotiations may be required to secure the most favorable price outcome
- xv. In all price and cost analyses, time is required.
- xvi. Begin the process as early as possible, even if funding has not yet been guaranteed. In all circumstances, the Procurement staff will be happy to assist.

Sources:

<http://www.who.edu/procurement/price-analysis-techniques>

<http://www.thomasnet.com/articles/engineering-consulting/price-cost-analysis>

2.3 When to use TCO

TCO can be used at various stages in procurement:

- i. In a business case, to assess the costs, benefits and risks associated with the procurement.
- ii. When assessing different business models, maintenance options or solutions on a comparable cost basis.
- iii. To understand the different cost drivers in the life of a procurement.
- iv. By a supplier 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.
- v. In selecting the best supplier by assessing the comparative whole-of-life costs of competing bids.
- vi. In managing the contract to track actual expenses and income against budget.
- vii. As part of a benefits realisation exercise.

2.3.2 Is TCO only relevant to goods?

- i. The concept of TCO is easy to understand in terms of goods, such as buying cars or leasing printers.
- ii. It can also apply to services such as a building maintenance agreement or providing training.

2.4 Total cost of ownership framework

- i. Figure 1 illustrates typical elements in the lifecycle of a commodity.



Figure 3: Typical Elements of the Lifecycle of a Commodity

2.4.1 Tip of the iceberg

- i. The initial purchase price is typically just the beginning, and there are additional costs that you will probably encounter.
- ii. There will be hidden costs.
- iii. You need to look beyond the purchase price to identify all other expenses and income over the whole life of the goods or service.

- iv. However, every procurement is different.
- v. So what needs to be included in the TCO calculation will vary.
- vi. The goal is to arrive at a figure that accurately reflects the full costs and income to your institution as indicated in Figure 2.



Figure 4: Typical Cost Drivers

2.4.2 Types of costs

- i. There are two broad types of costs:

2.4.2.1 Direct or “hard” costs

- i. Direct costs are attributed to a specific good or service.
- ii. In construction, the costs of materials used, e.g. wood, cement, doors, fittings and labour are all direct costs.
- iii. The following table shows a cost breakdown to support the TCO analysis.

Cost area	Data to collect (Typical questions)	How one might find this out
Material costs	What is it? How much is used? Where does it come from? How is it made?	Visit the factory, and talk to experts or material suppliers. Conduct research
Labour costs	How many man-hours does it take? Who is involved? What do they do? Is this a regulated body? Are there any regulated labour rates? Is	Local labour rates, trade associations, contracts,

Cost area	Data to collect (Typical questions)	How one might find this out
	there a minimum wage? Is there an acceptable premium rate?	regulatory bodies, gazetted fees e.g. PSIRA
Process costs	What is the process? What equipment is used? Does this supplier invest heavily in this area?	Annual reports, trade associations, experts
Distribution costs	How is it shipped? Who does it? What special needs exist?	Talk to logistics companies, Automobile Association (AA)
Overheads	Cost of the factory, offices, buildings, people, benefits, depreciation, sales, admin etc	Annual reports, visit, talk to experts, take a guess
Profit	What is the profit? What is returned to shareholders? What is reinvested?	Annual reports, talk to shareholders

Table 1: Cost Analysis

2.4.2.2 Indirect or 'soft' costs

- i. Indirect costs are not attributed to a specific good or service.
- ii. In manufacturing these include e.g. rent, taxes, maintenance of equipment, etc.
Indirect costs are further broken down into:
 - iii. Fixed costs (rent, insurance premiums, salaries).
 - iv. Variable costs (electricity, paper, pens and other consumables, overtime).

2.4.3 Components that contribute to TCO

- i. Direct and indirect costs can fall within one of the following three categories:

2.4.3.1 External cost

- i. External costs are usually purchase or acquisition costs and all costs from the manufacturer up to and including delivery to your warehouse:
 - a. Purchase Price
 - b. Inbound Freight Cost
 - c. Insurance Premiums
 - d. Packaging Cost
 - e. Rate of Exchange

- f. Duties and Taxes

2.4.3.2 Internal cost

- i. All costs associated with the internal handling and management of the product (e.g. installation, support, maintenance etc.):
 - a. Transportation Cost (internally)
 - b. Warehousing and Storage
 - c. Manufacturing Cost
 - d. Quality Assurance (internal)
 - e. Installation Cost
 - f. Operational Cost
 - g. Training Cost
 - h. Recovery and Disposal

2.4.3.3 Joint cost

- i. Joint supplier/client cost are those associated with administration, management and joint processes:
 - a. Redesign and Development
 - b. Other Joint Cost
- ii. Only those costs influenced by procurement and ownership of the commodity should be included.
- iii. Use the Value Chain Analysis and Supply Chain Analysis that you did earlier to complete this exercise, Figure 3.

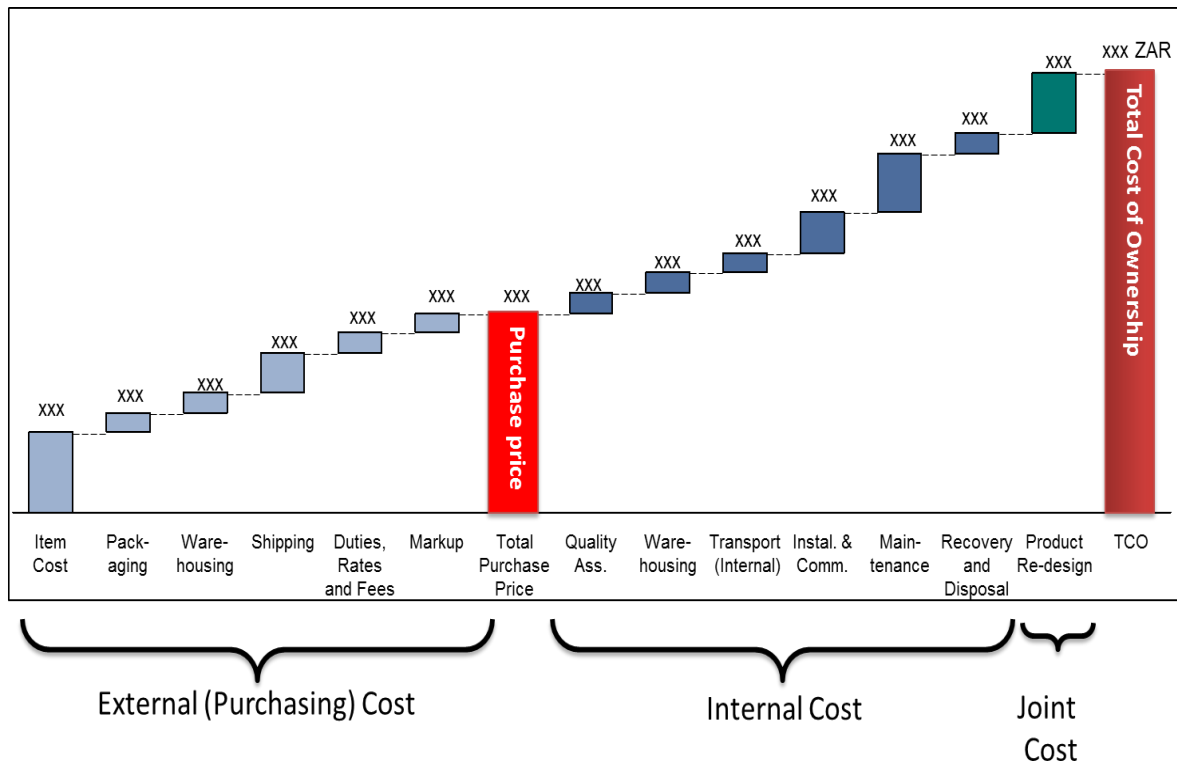


Figure 5: Typical Cost Breakdown

2.5 Addressing opportunities identified from TCO analysis

- i. Opportunities identified from the Total Cost of Ownership analysis can be addressed through four (4) main levers:

2.5.1 Functional excellence

- i. Exploit buying power
- ii. Increase levels of competitive bidding
- iii. Use strategic suppliers
- iv. Pool purchases across departments
- v. Capture savings in departmental spending areas

2.5.2 Cross-functional integration

- i. Alter specifications and reduce variants
- ii. Change processes to allow for product substitution
- iii. Reduce usage/demand for high-cost commodities

2.5.3 Organisational capacity building

- i. Create purchasing/category specialists
- ii. Redesign Organisational linkages and incentives to ensure ongoing change
- iii. Integrate purchasing into the service delivery function

2.5.4 Supplier integration

- i. Develop integrated strategic partnerships
- ii. Redesign joint operational procedures
- iii. Reassess make vs. buy decisions

3.0 Templates

Not applicable