

Chapter V

Core Cost Concepts

Up to this point we looked at the relationship of cost information to decision making, discussed the uses of cost analysis, and examined how to define a service and establish unit measures of services delivered. This chapter discusses various cost concepts and procedures for performing a cost analysis. In particular, this chapter presents terminology and definitions and a discussion of the relationship between various cost concepts and possible management responses to improving the efficient deliver of services. At the end of this chapter we examine the relationship of cost and pricing decisions.

Direct Costs

Direct costs are usually subdivided into personnel costs consisting of wages and benefits, and other direct costs (sometimes called non-personnel costs) consisting of equipment used and supplies consumed in the delivery of a service. For most services, personnel costs will be the lion's share of the total direct cost of providing a given service. However, the non-personnel costs should never be ignored in a cost analysis because they can be a significant fraction of the total direct cost. Therefore, an improved method for the use of equipment can be a major technique in either controlling or reducing personnel costs..

Exhibit 6 presents a checklist of basic direct and indirect costs relevant for a wide range of cost analyses. Suggested data sources are indicated, along with common problems associated with obtaining accurate data.

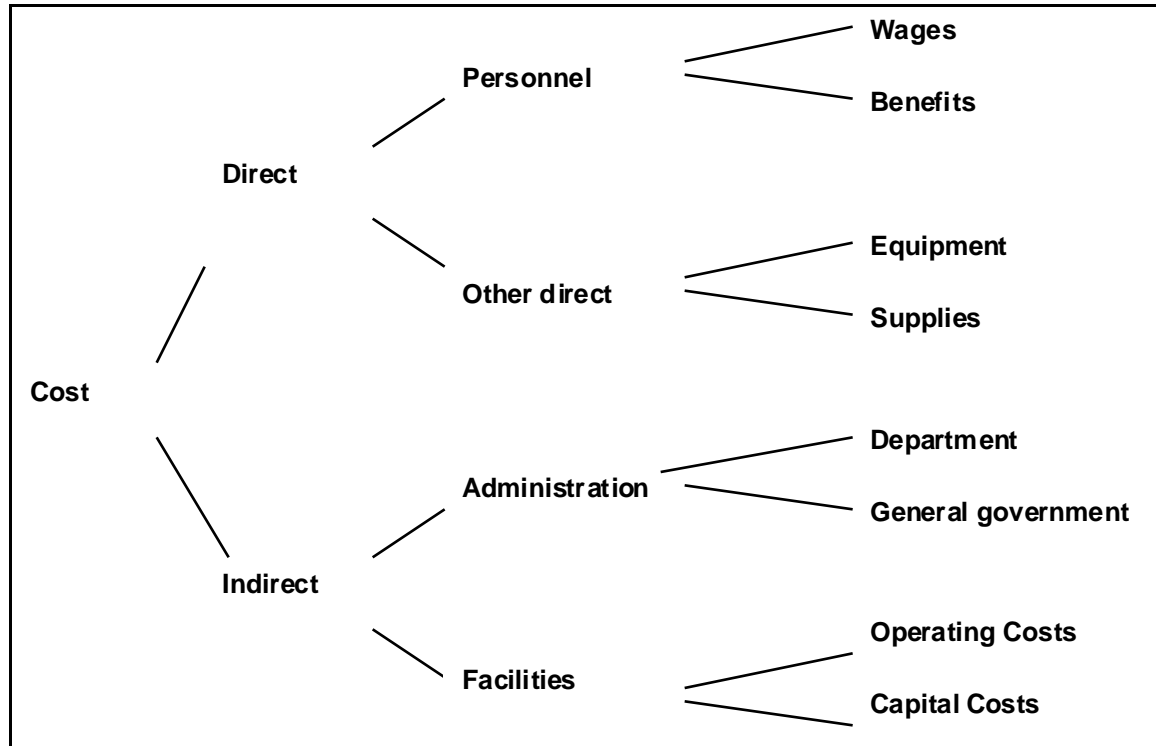
Exhibit 6 “Check List of Direct and Indirect Costs”

Type of Cost	Direct	Indirect	Data Sources	Cautionary Comments
Wages	X		Payroll Records	Are lump sum payments (e.g., longevity) included?
			Personnel Office	Do overtime payments distort the figures? (Is someone working “time” on one function but “overtime” on another?)
			Pay Plans	Are adjustments for overtime needed?
Vacation	X		Contracts	
Personal Days	X		Contracts	
Sick Leave	X		Contracts	Is sick leave “bought back” at retirement or resignation?
Other Leave	X		Contracts	
Insurance	X	X		Does the level of insurance change according to job

Health			Contracts	title?
Life			Contracts	
Dental			Contracts	
Workmen's Compensation			Federal/State Law	
FICA			Federal/State Law	
Civil Liability Insurance			Risk Manager	
Vicarious Liability Insurance			Risk Manager	
Pension Contribution	X	X	Actuarial Assessments	Is the system fully funded or only partly funded?
Office Supplies	X	X	Central Supplies	Is there a significant amount of "borrowing" between offices?
Equipment	X		Purchasing	Is there an internal charge for equipment rental?
Vehicles	X	X		Are the records kept by vehicle? How accurate are they?
Depreciation			Fleet Management	
O&M			Fleet Management	
Data Processing	X	X	Accounting Records	
Facilities	X	X	Public Works	Is there an internal charge for rent?
Depreciation			Assessor's Office	
O & M			Fixed Asset Records	

Exhibit 4 illustrates a division of costs into direct and indirect. Each category is then subdivided into its building blocks. The exhibit reflects a conceptual organization of costs that facilitates understanding the types of cost; however, it does not reflect the way information is stored in a typical government accounting system. Indeed, the principal operational problem in cost analysis is to take cost data as they are maintained in government records and to reassemble them into a form that facilitates decision making.

Exhibit 4 "Types of Cost: Direct and Indirect"



Direct costs are those that can be specifically assigned to the service being examined; for example, wages and benefits of employees who deliver the service, the cost of a vehicle used exclusively to deliver the service, and the cost of services and supplies consumed while providing the service. Indirect costs — commonly called overhead costs — are those that are necessary for the function of the organization but are not uniquely or easily assignable to a specific service; for example, depreciation on a building used to support several services, the cost of departmental leadership, and the costs of administering the government treasury.

While the distinction between direct and indirect costs seems clear conceptually, actual situations can often be quite complicated. Direct costs such as employee benefits are sometimes lumped together in one central account. As a practical matter, it can be difficult to apportion a centralized benefits account to individuals in a specific program. One way of getting around this problem is to average the benefits received by a group of people. Information for an allocation of this type is often contained in government contracts with unions and/or government agreements with vendors, insurance companies, etc.

In practical situations, the components of indirect costs can vary considerably from one jurisdiction to another. Some local governments provide many goods and services to departments from revolving funds or internal service funds and then bill each department accordingly. An example of this method of operation is a billing by the centralized data processing department for reports produced for each department. In some cities, the fleet maintenance department bills other departments for any use of a government vehicle. Since the department utilizing the service must pay a fee as if it was being provided by a private-sector firm, appropriate amounts of spending authority are included in department budgets for this purpose.

Many functions which constitute direct costs in one community, however, may be indirect costs in another. For example, if the building maintenance function in one government is

handled by an internal service fund that charges for the service via monthly rent bills, then the use of space for a given activity might be a well-defined and very direct cost. On the other hand, another jurisdiction might not charge for space, and therefore the item would appear as an indirect program cost.

Indirect Service Costs and Indirect Administrative Costs

It is useful to distinguish between two types of indirect costs: indirect service costs and indirect administrative costs. Indirect service costs are those that might be performed by a service unit by and for itself, but which are centrally controlled — usually for reasons of efficiency, control, or economies of scale. A centralized data processing operation or a purchasing function fall into this category.

Indirect administrative costs are associated with activities that must be incurred by the organization, but which do not directly benefit any service delivery function. The cost of elections and the cost of the legislative function are good examples of administrative costs.

Allocation Principles

In general, indirect service costs should be allocated to programs and cost centers in proportion to the amount of service or benefit received. Data processing costs might be allocated based on the proportion of reports produced for a given department or service or based on machine time used. Purchasing costs might be allocated based on the number of purchase orders and contracts issued or perhaps on the number of requisitions processed. Exhibit 5 presents some service functions and some commonly used allocation bases.

It is important to choose as an allocation base some readily available measure. Thus, if a personnel system were not computerized, the choice of the “number of personnel transactions processed” as an allocation base would be a mistake since information on this measure would probably not be easily accessible. In general, ease of application and understandability should be the major considerations in the choice of an allocation base.

Exhibit 5 “Service Allocation Bases”

Service	Allocation Base
Telephone	Number of handsets
Rent	Square feet of space
Custodial Services	Square feet of space
Payroll Expenses	Number of employees
Personnel Expenses	Number of employees
	Number of personnel transactions
Data Processing Expenses	
Data Entry	Time on task
	Number of key strokes
Programming	Hours of programming time

Machine Use	Proportion of machine time used
Purchasing Expenses	Number of requisitions Number of purchase orders or contracts
Accounting Expenses	Number of transactions processed
Vehicle Expenses	Number of miles driven Number of hours used
Insurance Expenses	
Risk	Number of employees within a workers' compensation risk classification code
Health	Number of employees
Life	Number of employees

Indirect administrative costs are intrinsically more difficult to allocate than indirect service costs because it is not possible to determine the relative benefit received by various service functions. Ultimately, all allocation procedures for indirect administrative costs will be substantially arbitrary.

A rational allocation procedure for these administrative costs should have the following characteristics:

- it advances management objectives,
- it is accepted as reasonable by affected parties, and
- it is relevant to the intended purposes of the users of the resultant information.

Advancing management objectives is a desirable characteristic of procedures for allocating indirect administrative costs. It should also be borne in mind when selecting a procedure for allocating indirect service costs. For example, management objectives might be important when a plan for user charges for a government-owned computer is devised. If the computer is substantially underutilized, it may be in the interest of the jurisdiction to underprice the service to encourage its use (since the capital costs represent money already spent). It may even be desirable to lump the data processing expenses into indirect administrative costs (which will be allocated to users and nonusers alike) and have no formal charging system at all. As the capacity of the machine is reached, however, it will be in management's interest to reevaluate the pricing policy with a focus on rationing a scarce resource.

Total Cost

Total cost — the sum of all costs, direct and indirect — is a useful concept whenever a service charge is being evaluated, since it is concerned with the measurement of the total government effort required to deliver a service. In addition, total cost can be a useful concept in a comparison of the government's service delivery efficiency with either the private sector or other governments.

Just knowing the total cost of a service, however, is of limited value; *understanding* total cost should always be the goal. What fraction of the total cost of a service is fixed? How has this changed over time? What portion of the total cost is overhead (departmental and governmental) and why? What are the major constituents of the total cost; are they personnel, equipment, supplies?

Understanding total cost by examining its components can provide the information necessary for informed decision making. It allows a government to focus its actions where they will be most effective.

Additional Cost Concepts

The concepts of direct and indirect costs provide a basis for one approach to cost analysis, an approach that stresses the organizational structure of the jurisdiction. Additional cost concepts which view cost from other perspectives are also helpful. Exhibit 7, "Cost Concepts," lists various approaches widely used in performing cost analyses. Each concept is applicable to situations in which cost is a central focus.

Fixed Costs

Fixed costs represent commitments that the jurisdiction has already made and cannot avoid, at least in the short term. Examples include rent required pursuant to a lease, depreciation (colloquially, wear and tear) on government-owned structures or equipment, and payments of interest on bonded debt. Because they tend not to change with changes in service levels, fixed costs are more difficult to reduce in the short run than variable costs, which can be altered fairly quickly.

Exhibit 7 "Core Cost Concepts"

Concept	Definition
Direct Cost	A cost that can be assigned specifically to a given or particular service.
Indirect Cost	A cost necessary for the functioning of the organization as a whole, but which cannot be directly assigned to one service.
Total Cost	The sum of all costs, direct and indirect, associated with the provision of a given or particular service.
Fixed Cost	A cost that does not change with increases or decreases in the amount of service provided (e.g., rent).
Variable Cost	A cost that increases or decreases with increases or decreases in the amount of service provided (e.g., salary).
Sunk Cost	A cost that has already been incurred (e.g., the cost of a previously-

	purchased computer system).
Marginal Cost ¹	The increase in total cost associated with an increase in the amount of service provided (e.g., if a new computer report was requested, its marginal cost would be predominantly the cost of the time it would take to program it — assuming the computer was a sunk cost).
Avoidable Cost	The amount of expense that would not occur if a particular decision was implemented (e.g., if a clerk is laid off and a community is self-insured for unemployment compensation, the avoidable cost is total direct salary less payments for unemployment benefits plus savings in employee benefits).
Life-Cycle Cost	The total of all costs associated with ownership of an item, including acquisition, operation, and maintenance, over the life of the equipment, less the resale value, if any.
Unit Cost	The cost of production of one “unit” of a given service.
Opportunity Cost	The benefit that would have been received if an alternative course of action had been pursued.
Relevant Cost	The appropriate cost concept for the particular problem at hand. E.g. For full cost recovery, total cost is the most appropriate cost concept.
Cost	The amount of money or other consideration exchanged for property or services.
Expense	A decrease in net total assets. Expenses represent the total cost of operations during a period, regardless of the timing of related expenditures.
Expenditure	A decrease in net current assets.
Cost Analysis	Cost analysis is the combined process of <ul style="list-style-type: none"> • defining a service, • establishing the volume of the service, • settling on the <i>relevant cost concept</i> to address the perceived problem, and • determining the cost of some alternative to the existing service deliver pattern.
Cost Accounting	That method of accounting which provides for assembling and recording all of the elements of cost incurred to accomplish a purpose, to carry on an activity or operation, or to complete a unit of work or a specific job.

Variable Cost

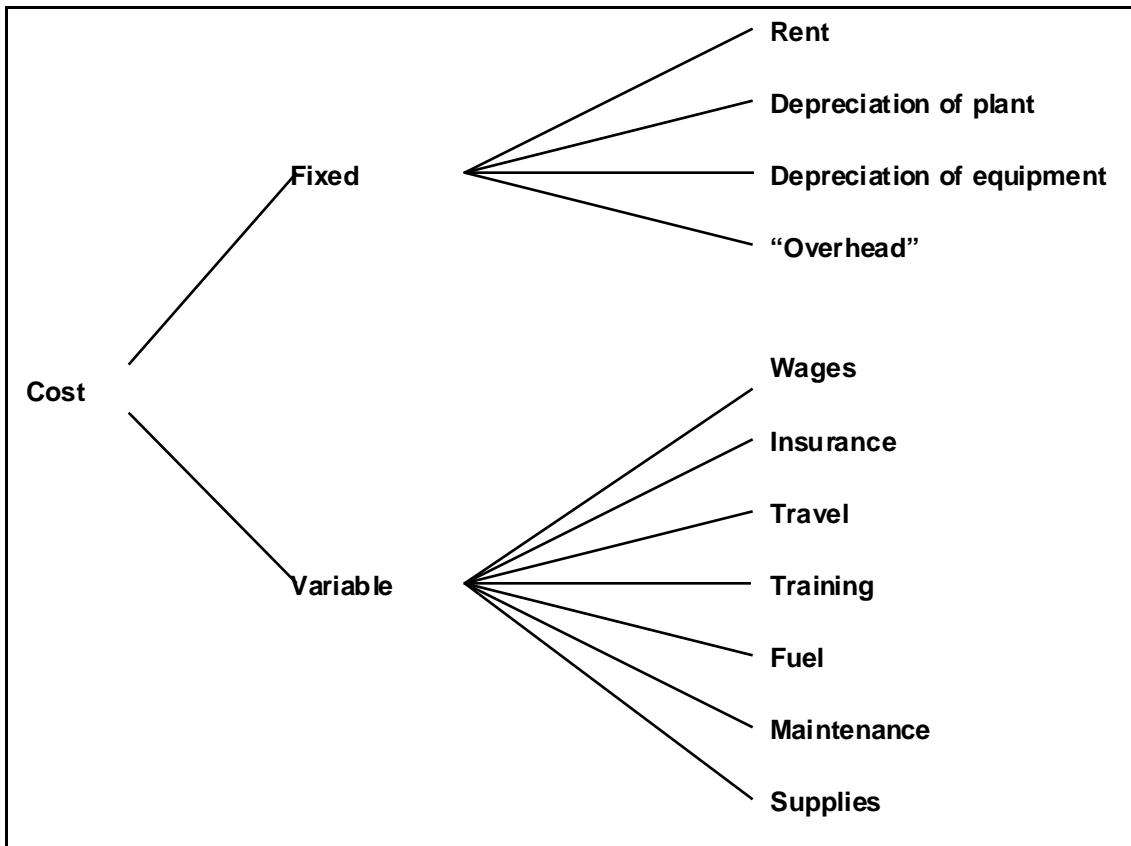
Variable costs are those costs which are responsive to changes in levels of service or the number of units of production — changes which generally can be achieved in the near term. Examples include personnel expenses (individuals can be transferred to other functions or laid off), the costs of supplies, fuel, and travel.

¹ Cost accounting texts prefer the term “differential cost” for what we call “marginal cost”.

Information about the variable costs of providing a service can be useful when consideration is being given to relatively small adjustments to the volume of service delivery. In such cases, the variable cost of providing a unit of service will represent the marginal cost or savings of either increasing or decreasing the service by one unit. Multiplying the unit variable cost by the proposed change in the number of units of service to be delivered gives the change in cost that can be expected from the proposed action.

When it is important to reduce expenditures in the short run (perhaps to avoid a looming deficit), an analysis of costs from a fixed versus variable perspective will yield information about the degree of short-term control that is possible. In the short run, few costs are variable while in the long run all costs are variable, so the time frame in which such an analysis is being conducted is important.

Very often there is a tendency to regard indirect costs as fixed and to consider only variable costs in the service departments when looking for potential savings. It is important to remember that efficiency improvements and cost savings can be achieved in all sectors of the government. Cutting indirect costs is difficult however, and requires thorough understanding of the consequences.



Sunk Cost

Sunk costs are costs that were incurred at some prior time — they are the spilt milk of cost analysis. Examples of sunk costs include equipment that has been paid for and expenditures for personnel time already worked. (One notable example of a cost of this type was provided to this author by the government manager of a coastal community. It

happened that a fire boat was purchased and moored incorrectly to a dock at high tide. When the tide went out, the fire boat became a very sunk cost.)

Because they have already occurred, sunk costs share with fixed costs a relative isolation from management control. Even so, whenever significant investments have occurred in some previous time period they may play an important role in current decision making. By utilizing these investments, it may be possible to achieve a purpose in a less expensive fashion than if one were starting from scratch. For example, it may be desirable to use fully depreciated equipment, such as a still useful word-processor, for a purpose that never would have justified its purchase. This would take advantage of the residual value of the equipment while reducing the cost of the project. Older equipment, however, should never be preferred to the purchase of newer equipment solely because it is already owned. The potentially higher operation and maintenance costs for older equipment plus the possibility of improved productivity with newer equipment can combine to make the perceived advantages of using existing equipment illusory.

Because of the risk of being criticized for wasteful spending, attention to sunk costs in government can be excessive. It is important to recognize what sunk costs are involved and then to realistically assess whether any value remains that can be used to reduce future costs.

Marginal Cost

The marginal cost of an action is the increment/decrement in cost associated with the action. As such, marginal cost does not include any sunk costs (because they have already occurred) and usually does not contain any indirect costs (as long as indirect costs are not increased by the action in question).

The concept of marginal (incremental) cost first arose in manufacturing environments where, if fixed costs are ignored, the cost of producing one more unit is only the cost of the extra materials and labor consumed. In a situation where it is desirable to encourage consumption of a product or service, pricing a good or service at marginal cost (because it is less than total cost) is a no-loss pricing technique. Marginal cost pricing might be used as follows: a small, flat fee is levied for the lowering of a curb for a new driveway if the sidewalk on the block is being replaced at the same time. Since the government has already committed itself to a certain level of fixed costs in the sidewalk replacement effort, the marginal cost of lowering a curb at the same time will be quite low in comparison to the total cost of the job. In addition, the new driveway might help increase the number of off-street parking spaces, thereby lessening on-street parking problems. It might also increase the property values of buildings on that street.

Avoidable Cost

Avoidable cost is in many respects the opposite of a sunk cost. A sunk cost is basically irrelevant to distinguishing between management options but avoidable cost information is at the center of effective decision making. Knowing the avoidable cost that will result from a proposed management change is one of the most useful facts for local officials. Measuring the savings that result from improved methods of delivering public services is a necessity for effective service delivery especially if resources are scarce. Because determining the reduction in expenditures resulting from productivity improvement efforts is so important, later chapters contain case studies on the determination of avoidable cost.

Life-Cycle Cost

Life-cycle costing — the process of considering all costs associated with the acquisition and use of an item — is most beneficial as a tool for use in equipment acquisition. It can be used to avoid the exorbitant repair and maintenance costs that frequently follow the purchase of the item with the lowest sale price. Since benefits accrue over time and may not be realized immediately, it is difficult to grasp the significance of the savings that will result from equipment purchased using life-cycle costing.

Unit Costs

Unit costs are a valuable management tool because unit costs relate inputs to outputs; they relate expenditures (appropriations) to the purposes of expenditures (public safety or public health, for example). Properly used, unit costs can be a barometer of administrative health. They provide an early indication of problem situations, such as unexplained increases for an item over a period of time. Or, they might indicate that the cost of a unit is much higher than it would be in the private sector. On the other hand, a very low unit cost might indicate a problem of inadequate use of resources to achieve the desired result.

The cost concepts presented in Exhibit 7 do not exhaust the existing possibilities but they do provide a starting point. Once their uses and applications have been mastered, it is possible to conduct advanced evaluations such as cost/benefit analyses and cost/effectiveness analyses, among others — which are not considered in this book.

No Single Concept Addresses All Needs

As we have seen, cost analysis is a tool that can be used to provide cost information crucial to effective management. Since such needs change with the problems being addressed, it is to be expected that the type of cost information will vary with the nature of the problem. If the issue being examined is pricing a service to recover all costs, the appropriate cost concept will be total cost, since only total cost includes all of the various costs incurred in the delivery of a service. If the issue is minimizing costs of equipment, life-cycle costing provides a method for identifying and minimizing the total cost of equipment ownership.

Identifying which cost concept is the most effective tool for addressing a given management problem (i.e., determining the relevant cost concept) is the key step in cost analysis.

Management Choices and Cost Concepts

Consider the case of a jurisdiction under severe budget pressure: taxes are static and the effects of inflation are driving up costs relentlessly. What options for service delivery are open to management? How can different options best be evaluated?

One possible approach to take in this situation is to draw up a list of target services and management options. The options list represents actions that management might take to cut costs, increase output, or raise revenue. Target services are those that are subject to management control and, based on local knowledge, are believed to be less than optimally efficient. Using this information, a matrix can be prepared that lists the services on the left and the management options across the top.

Exhibit 8 is a management options matrix for a community. The column on the left — Refuse Collection, Golf Course, etc. — represents services that local officials have targeted for significant management initiatives to either decrease costs or increase revenues. The top

row — Eliminate Service, Reassign Personnel, etc. — consists of actions that management might consider making to improve the current service delivery situation.

In practice, the list of services that a jurisdiction will wish to examine will vary considerably; after all, not every government has a golf course. Similarly, the options that governments will find appropriate to their particular circumstances will vary with the services being examined; for example, civilianization — substituting civilians for sworn police officers — is most applicable to police services. As a rule, each government must analyze its own services, select candidates for management action, and determine possible responses.

The management options matrix forms a basis for the discussion of appropriate management options for dealing with each service issue. For example, a check mark placed under “charge for service” on the golf course line would indicate that the institution of a fee should be considered as a management response to the cost/service issues related to the golf course. If a charge already exists, an increase in rates might be an appropriate response.

It is important to remember that there can be more than one answer in a given row and that individuals may well differ over an appropriate response for a given service category.

Making The Transition

In making a decision on a management action, it is important to be able to estimate the financial impact of the action and its possible side effects. If refuse collections are to be changed from twice a week to once a week, how much money will be saved and will this action result in a health problem in the summer months? If the fire alarm boxes are to be disconnected, what will be the savings from decreases in false alarms? What will be the disconnection cost? Will the government be exposing itself to a liability by not providing fire alarms?

The costing matrix illustrated in Exhibit 9 provides a tool for identifying the appropriate cost concept to be used to evaluate the potential savings of implementation of options identified in the management options matrix. A separate costing matrix form should be used for each service identified in the management options matrix. The top row from the management options matrix is now the lefthand column. The top row represents applicable cost concepts. For each of the management options listed at the left, an “X” indicates an appropriate cost concept for analyzing the effectiveness of that proposed solution.

Exhibit 8 “The Management Options Matrix”

	Eliminate Service	Reassign Personnel	Reduce Service	Improve Productivity		Civilianize Service	Substitute Equipment	Charge for Service	Status Quo
Retuse Collection									
Golf Course									
Fire Alarm System									
School Crossing Guards									
School Athletics									
Branch Libraries									
Building Maintenance									
Print Shop									
Arts and Crafts									
Data Processing									
Police Communications									

Exhibit 9 “The Costing Matrix”

	Direct Cost	Indirect Cost	Marginal Cost	Fixed Cost	Unit Cost		Avoidable Cost	Life-cycle Cost	Total Cost
Eliminate Service				X			X		
Reassign Personnel							X	X	
Reduce Service	X	X	X				X	X	
Improve Productivity			X		X				
Contract Out							X		
Civilianize Service	X						X		
Substitute Equipment				X	X		X	X	
Charge for Service	X	X	X						X
Status Quo	X	X							X

Which Are the “Right” Answers?

Responding to service delivery problems requires a knowledge of the service in question and of the organization as whole. It requires balancing the needs of one part against the needs of other parts and sometimes balancing the needs of a part against the needs of the whole. There is generally no single right answer to a service delivery problem. Only knowledge of the specifics of the case in question can reveal what is, perhaps, the best choice. Any of the columns in the management options matrix may be an appropriate management response to a given problem under particular circumstances.

As Exhibit 9 shows, avoidable cost is frequently a relevant cost concept. In general, when changes are being designed to cut costs or improve productivity, avoidable cost should be a focus of attention since the decision process should be based only on the money that can actually be saved. Thus, in particular, sunk costs are irrelevant — sunk costs are the spilt milk of cost analysis.

If management wishes to substitute equipment, sunk cost is relevant because equipment will represent a sunk cost after purchase; unit costs will be affected by the cost of the use of the equipment; isolating an avoidable cost is probably the purpose of purchasing the equipment; and life-cycle cost will provide an effective equipment procurement strategy.

The concept of marginal (incremental) cost is used when considering the expansion of an existing service or the establishment of a new service since the jurisdiction will presumably provide the existing support services whether or not the service is expanded or a new one established. A detailed marginal cost analysis is included in a later chapter.

Total cost is important as a management tool when tracking expenditures because only when all relevant facts are considered can a judgment be made as to the value of the service delivered. It is because of this that total cost is the most effective concept to use when costing a service from the perspective of determining a service charge. Only when all costs of providing a service are assembled can an understanding be achieved of what it costs to deliver a service. The next chapter contains an example of total cost determination.