Cost Accounting and Analysis

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15 October 2024

Overview

Cost accounting

- Allocation of cost to mission centers

Non-personnel cost

- Hoosier County Road Department

Personnel cost

- Hoosier Police Department

Break-even analysis

- Garbage collection

Introduction

Cost accounting

- Classification of financial information from a budget or financial reports into cost categories based on agency's cost structure analysis about the relationship of resources spent on major services
- *"A method of accounting which provides for assembling and recording all elements of cost incurred to accomplish a purpose, to carry on an activity or operation, or to complete a unit of work or specific job."* (Oregon Accounting Manual, Department of Administrative Services, Number 65.00.00, 2010)

Cost analysis

- Use of cost data to analyze the determinants of costs and evaluate changes in agency operation
- Basis for setting user fees for public services
- Decision tool for service contraction or expansion

Terminology

Obligation: Responsibility to meet terms of a contract

- Example: Road salt purchases in June for delivery in October

Outlay: Physical outflow of cash

- Example: Payment for road salt in September

Cost: Actual use and consumption of the resource

- Example: Road salt consumption in December and January as cost in two different calendar years

Difference between operating cost and capital asset acquisition

- Operating cost: Usually small differences between obligations, outlays, and cost
- Capital assets: Investment spread over multiple years due to multi-year consumption and depreciation

Cost Accounting Overview

Introduction

Goal

- Assignment of costs to services and categories that are useful for cost analysis

Data sources

- Past budgets
- Operations reports
- Contracts, billing statements

Determination of mission and/or service centers

- Categorization of main services provided to the public
- Example: Road maintenance of a Department of Transportation

Direct Cost vs. Indirect Cost

Direct costs

- Costs precisely assigned to a specific service
- Example: Use of asphalt to repave Meridian Street in Indianapolis

Indirect costs

- Costs not precisely assigned to a specific service
- No causal link between service provision and costs
- Example: Salary of the manager handling road maintenance in Indianapolis

Cost accounting: Conversion of indirect costs into direct costs

Cost Concepts and Examples

Fixed cost: Fixed and not varying with output

- Office space rent

Variable cost: Varies with level and/or each unit of goods and services provided

- Pavement of roads using asphalt

Semi-variable cost: Costs with fixed and variable component

- Copy machine

Step cost: Varies with output but with discrete jumps

- One additional teacher for every 20 students

Cost Accounting Steps

Overview

1. Identification of mission centers
2. Identification of activity and output units
3. Identification of expenditure categories
4. Identification of allocation factors
5. Linking cost to mission centers

Step 1: Identification of Mission Centers

Parts of organization providing direct service to public

- Separate services requiring the development of unit cost
- Link to user charges or reimbursement rates

Examples:

- Water department: Distribution and treatment
- Fire department: Fire suppression and fire prevention
- Sanitation department: Garbage collection and disposal

Step 2: Identification of Activity and Output Units

Key objective of cost accounting: Calculation of per-unit cost

- Identification of units by mission center

Requirement: Measurable activity

- Examples: Activity/output unit associated with nursing home, garbage collection, water department, police department

Step 3: Identification of Expenditure Categories

Personnel expenditures

- Direct personnel
- Fringe benefits (e.g., health insurance, Social Security)

Non-personnel expenditures

- Supplies
- Equipment
- Utilities
- Facilities

Step 4: Identification of Allocation Factors

Requirement of using allocation factors to link indirect cost to mission centers

Indirect Cost	Allocation Factor
Facilities	Square footage
Overhead	Direct personnel or direct cost
Liability insurance	Direct personnel or output
Computer usage	Direct personnel or output
Printing services	Output

Step 5: Linking Costs to Mission Centers

Direct cost

- Costs assigned directly to mission centers
- Ideal case: Conversion of all cost to direct cost and assignment to mission center
- Examples: Salaries of direct service providers, supplies/materials/equipment used to provide service, utilities/fuel used to provide service.

Indirect cost

- Costs not directly assignable to mission center.
- Ideal case: Minimizing indirect cost no assignable to mission center

Overhead

- Costs for providing administrative services to all mission centers, e.g., salary of management
- Insurance/utilities/facilities: In case usage not identified by mission center

Hoosier County Road Department

Overview

Mission

- The mission of the Hoosier Road Department is to maintain the county's roads.

Personnel

- All personnel work full time and 225 days per year.
- All maintenance personnel receive the same salary and fringe benefits totaling $74,000 per employee

State reimbursement

- The state carries out new road construction but reimburses the county at a fixed rate per mile for maintenance.

Workload

Although most roads in the county are paved, there are still some gravel roads left. The entire road network in the county does not get maintained every year but only a portion is maintained every year.

- The County Legislature has proposed that the department should maintain 80 miles of gravel roads and 185 miles of paved roads in upcoming year.

On the next slide, you find a summary of the activity and cost information that was put together for the current fiscal year. For simplicity no inflation was assumed in the initial cost analysis.

Parameters

	Gravel	Paved	Total
Supplies expenditures	$41,000	$180,000	$221,000
Miles Repaired	80	185	265
Cost per Mile	$513	$973	
Personnel (FTE)	4	5	9
State reimbursement per mile	$6,250	$10,200	
Productivity (miles/person/year)	20	37	
Maintenance employee salary	$74,000	$74,000	
Director's salary			$96,000
Assistant's salary			$61,000
Equipment lease: Rate/month	$6,250	$9,750	
Equipment lease: Rate/mile	$725	$1,100	
Maintenance facility			$210,000

Break-Even Analysis

Garbage Collection: Setup

Revenue

- Collection fee: $2 per 96 gallon container

Cost

- Annual fixed cost: Administration ($35,000) and equipment lease ($85,000)
- Variable cost per container: Landfill charge ($1) and equipment operation on collection routes ($0.40)

Tasks

- Determination of total revenue, fixed cost, variable cost, and total cost
- Profit with averaging 250,000 containers per year
- Effect on cost and profit of increase in landfill charge to $1.30

Surplus/Deficit Calculation

Item	Current LF Charge	New LF Charge
Number of containers	250,000	250,000
Collection Fee	$2	$2
Revenue	**$500,000**	**$500,000**
Administration	$35,000	$35,000
Equipment Lease	$85,000	$85,000
Fixed Cost	**$120,000**	**$120,000**
Landfill charge	$1.00	$1.30
Equipment operating on collection routes	$0.40	$0.40
Total variable costs per unit	$1.40	$1.70
Variable Cost	**$350,000**	**$425,000**
Total Cost	$470,000	$545,000.00
Surplus/deficit	**$30,000**	**$(45,000)**

Break-Even Graph

```
## Warning in geom_segment(aes(x = 200, y = -120, xend = 200, yend =
## i Please consider using `annotate()` or provide this layer with da
##   a single row.
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