

Chapter VI

Case Studies in Costing

This chapter contains case studies of three applications of cost analysis to local government problems. One is based closely on the actual records of a municipality, while the other two studies were actually performed by the governments indicated. Each focuses on different cost concepts and addresses different management problems.

The case study from Phoenix, Arizona focuses on avoidable costs — the most difficult of the cost concepts to apply in practice because of the risk of unintended side effects. Avoidable cost is difficult to calculate, but as this case study shows, the benefits that knowledge of avoidable cost can yield — both financial and programmatic — can be very great.

The Fayetteville study describes how a small jurisdiction developed an hourly rate (instead of a fixed, average rate) for a service it provided, by calculating first the total cost of the service. This approach was appropriate because the service was used in different amounts by various persons. The hourly charge was therefore more equitable than a single charge levied on all users.

The Dayton, Ohio case study, regarding the costs of instituting a new police service in the downtown area, focuses on marginal cost. By isolating those costs that would be increased or created by the decision to initiate the new service, the proper focus is provided for management decisions.

A Note On Report Writing

It is an unfortunate fact of life that many good ideas have been ignored because they were expressed poorly. Since the written word is the form of communication that reaches the largest number of people in an average government, the ability to communicate effectively by an analyst or manager is directly related to his or her ability to write an effective report.

A well-written report should have the following characteristics:

- clarity,
- completeness,
- effective layout, and
- intellectual honesty.

The report reader should never wonder what the writer is saying. Clarity of expression and content is essential. One approach to clarity of content is directness of writing style. Avoid the passive voice; it is indirect and weak as a form of expression. Use the simplest words that express the idea to be communicated. Be plain and lucid, never fancy.

For completeness, a report should be more than a ragbag of facts; the reader should be able to determine that all appropriate elements are present. In addition, a report should be self-explanatory and immediately understandable; no background knowledge should be

assumed. (Thus, for instance, titles should be used rather than the names of the people currently holding the positions.)

When appropriate, a report should offer options. If consideration is being given to either the establishment of a new service or the expansion of an old one, options should always be offered. When a new service is first considered, the “quantity” of the service is problematic; offering degrees of service can help decision makers (the administration, the council, and the public) to reach a consensus on the level of service needed to resolve the problem satisfactorily.

An effective report is well laid out. The presentation should reflect the relative importance and appropriate subordination of material. Details should be presented, but should be relegated to an appendix.

Effective reports generally begin with a brief summary, then provide background information before they proceed to the body of the report. Most effective reports conclude with clear and unambiguous recommendations.

A report must be intellectually honest. Sources should always be cited. The degree to which the report presents more than the writer's opinions should be clear to the reader. All important limitations should be appropriately noted.

In a well written report, craftsmanship speaks from every line.

City of Phoenix, Arizona: A Case Study in Avoidable Cost

The effective analysis of alternatives to the existing mode of delivery for a particular service requires the calculation of the changes in cost that will result from new ways of doing things. The cost concept that applies to this situation is *avoidable cost*.

It is important to emphasize that, as a cost analysis concept, avoidable cost is the net result of proposed changes. If a change results in an increase in one cost element such as equipment and a decrease in another such as personnel time, the avoidable cost is the net of the amount of the savings in wages and fringe benefits minus the expense of the equipment.

Determination of the actual avoidable cost in a given situation perhaps is the most difficult to perform of all the types of cost analyses that have been discussed. This is so because the range of considerations that must be included in this type of cost analysis is much greater than in the calculation of total cost. Every opportunity to save money should be examined; every requirement to spend money must be factored into the analysis. The latter aspect can be particularly difficult, since governments are complicated organisms whose parts are frequently interrelated in little-understood ways. Thus, the risk of costly, unintended side effects is always present when changes are made.

There are some principles that can be used to help avoid such undesirable surprises:

- Always be thorough in preparing an analysis (an incomplete analysis is wrong);
- Always use conservative estimates (low on savings, high on costs); and
- Have any important analysis reviewed by an informed but uninvolved party.

If these guidelines are followed, the risk of incorrect or incomplete analyses will be reduced.

Application of Avoidable Cost to Reduce Overtime Costs

What follows is the report on an actual cost analysis conducted by the City of Phoenix, Arizona presenting the results of a six-month pilot test of a police/ court standby program. The goal was to reduce unnecessary court appearances for police officers and the attendant overtime costs.

Analysis of Police Court Standby Program

Courtesy of City of Phoenix, Patrick Manion, Management and Budget Director.

The six-month pilot test of the police court standby program has concluded and a decision is needed on the extent to which the standby program should be implemented in the court's 14 divisions.

This report presents an analysis of the police court standby program based on six months of experience. Police standby was tested in six divisions of the Phoenix Municipal Court on jury trial days from January 1980 to July 1980. The table below summarizes the results of the test program, and also projects its full-year impact for all 14 divisions.

During the six-month period, 1,326 trials were scheduled for the six court divisions, and 2,087 police officers were subpoenaed. The number of trials held was 221, or 16 percent of those scheduled. Of those officers subpoenaed, 1,473, or 71 percent, were off duty at the time of the trial. Off-duty officers on standby received a \$15 fee which was supplemented by an average minimum of \$41 in overtime if the officer was summoned to court.

The court standby program produced cost savings of \$26,000 for the test period. Of this total, \$18,000 is attributable to jury trials and \$8,000 to nonjury trials. The net annual cost savings projected if all 14 divisions used the standby program is \$109,000.

	Savings During Test Period	Annual Savings for All 14 Divisions
Jury Trials	\$ 17 867	\$ 83 328
Non-jury Trials	8 213	38 304
Total Savings	26 080	121 632
Less Cost of Court Clerk for Police Court Liaison		<u>(13 000)</u>
Net Cost Savings		\$ 108 632

Background

The police court standby program was implemented to reduce unnecessary court appearances for police officers and the overtime costs thereby incurred. Standby procedures involve verification of police availability and placement on standby status (on call) prior to the trial date, and subsequent notification of release from standby or the need to appear in court on the trial date after proceeding to trial is assured.

Off-duty police officers earn a minimum of three hours of overtime pay for court appearances. Off-duty officers placed on standby are eligible for a \$15 standby fee, effective July 7, 1980. On-duty police officers called to court receive no additional earnings and are not replaced in the field.

Data for the above table were derived from Police Court Services records. These records include a list of the cases scheduled for each day, the offense, and the officers involved in the case. From notations on these records it was possible to determine whether the case was tried and the status of the officers involved. The data in the table reflect the information derived from these records for the period January 2, 1980, through July 3, 1980.

Discussion

For the purposes of this analysis, the \$15 current standby fee was used to calculate cost savings rather than the \$5 fee in effect during the pilot test. The rationale for this substitution is that the current standby fee is necessary for assessment of the present and future cost effectiveness of the program. Overtime costs were computed at \$41 per court appearance, a median police salary figure.

The data in the table reflect those cases scheduled for trial in the six test divisions. These cases include all jury-eligible cases and nonjury cases which, because of the practice and the nature of the case, are scheduled for jury days. The distinction between jury and nonjury was made through references provided by the prosecutor's office. The jury category includes all jury-eligible cases.

Some of these may have involved the waiver of a jury trial for a trial before a judge. Such cases could not be distinguished in the source documents.

The cost savings achieved through the standby program were computed by comparing actual standby costs and overtime costs, where applicable, to the overtime costs which would be incurred in the absence of a standby program.

Projected Full Year Cost Savings

Projection of the cost savings to all 14 divisions of the court for a 12-month period indicated a potential net cost savings of \$109,000. The current \$15 standby fee was used in the computation of potential cost savings. Projection of cost savings is based on the assumption that all officers entitled to the standby fee would claim it (in many instances during the pilot program police officers who were eligible for standby fees did not claim them). Extension of the police standby program will require an additional Clerk II, to replace the clerk trainee used during the six-month study, at a full-year cost of \$13,000. If extension of the standby program is made only to jury cases, as proposed, the net full-year cost savings for all 14 divisions would be about \$70,000.

Why Standby Works

Of the 1,326 trials scheduled, 221 or 16 percent were held. The difference between trials scheduled and trials held is those cases which are rescheduled or dismissed, those for which warrants are issued, bonds forfeited, etc. The relationship between trials scheduled and trials held is fundamental to the achievement of cost savings through the standby program. Under the standby program, an off-duty officer on standby assigned to a case which does not go to trial receives \$15, resulting in a \$26 savings over the standard overtime amount of \$41; however, if the same case goes to trial, the cost is \$56 (\$15 plus \$41) or \$15 above the standard overtime amount. In order for the standby program to be cost-effective, the number of off-duty officers not called to court must exceed the number called.

Productivity Impact on Police

On-duty police officers subpoenaed for court appearances incur no additional costs in earnings or replacements. However, police productivity in the field is reduced through the absence of these officers. On-duty police officers on standby, whose appearance in court is not required, avoid this productivity reduction. The percentage of on-duty police officers which reflects this productivity impact is shown in the table below. Productivity gains would equate to approximately \$42,000 annually.

On-Duty Officers Subpoenaed			
	Subpoenaed	Appeared	Did Not Appear
Total	614 (100%)	133 (22%)	481 (78%)
Jury	314 (51%)	40 (30%)	274 (57%)
Nonjury	300 (49%)	93 (70%)	207 (43%)

Productivity Impact on Courts

Court estimates indicate some reduction in court productivity because of delays in proceedings while awaiting the arrival of police officers on standby. These delays involve court staff time including judges, prosecutors, bailiffs, jurors, and witnesses. The delay attributable to the standby program and the cost in reduced court productivity have not been documented.

Procedural Aspects

Under the standby program, police officers, who have been subpoenaed through interoffice mail, call Court Services prior to the trial date to verify case status. If the case is still slated for court the officer is placed on standby and provides a telephone number where he/she can be reached should the case proceed to trial. On the trial day the division prosecutor telephones Court Services, as information develops, to release the officer or call the officer to court. Officers called to court are to report within 40 minutes.

Schedule I Police Court Standby Program Test Period Statistics January — June, 1980				
	Police Subpoenaed	Jury	Nonjury	Total
	On Duty	314	300	614
	Off Duty	<u>878</u>	<u>595</u>	<u>1 473</u>
	Total	1 192	895	2 087
On-Duty Police Called to Court		40	93	133
Percent of Total Subpoenaed		12.7%	31.0%	21.7
Off-Duty Police Called to Court		121	177	298
Percent of Total Subpoenaed		13.8%	29.7%	20.2
Total Police Called to Court		161	270	431
Percent of Total Subpoenaed		13.5%	30.2%	20.7

Schedule II Police Court Standby Program Cost Savings Calculations			
Jury Trials			
(1)	Cost if All Off-Duty Police Called to Court	878 x \$41 =	\$ 35 998
(2)	Cost for Off-Duty Police Not Called to Court	757 x \$15 =	\$ 11 355
(3)	Cost for Off-Duty Police Called to Court	121 x \$56 =	\$ 6 776
	Total (2) + (3)		\$ 18 131
	Difference (1) – (2) – (3)		\$ 17 867
Nonjury Trials			
(4)	Cost if All Off-Duty Police Called to Court	595 x \$41 =	\$ 24 395
(5)	Cost for Off-Duty Police Not Called to Court	418 x \$15 =	\$ 6 270
(6)	Cost for Off-Duty Police Called to Court	177 x \$56 =	9 912
	Total (5) + (6)		\$ 16 182

Difference (4) – (5) – (6)	\$ 8 213
Projected Full-Year Savings for 14 Divisions:	
Jury Trials	
Test Period Savings for Jury Trials: \$17,867	
$\$ 17,867 / 6 \text{ divisions} / 6 \text{ months} = \$496/\text{division}/\text{month}$	
$\$496 \times 14 \text{ divisions} \times 12 \text{ months} =$	\$ 83,328
Nonjury Trials	
Test Period Savings for Nonjury Trials: \$8,213	
$\$8,213 . 6 \text{ divisions} . 6 \text{ months} = \$228/\text{division}/\text{month}$	
$\$228 \times 14 \text{ divisions} \times 12 \text{ months} =$	\$ 38,304
Annual savings for Jury Trials =	\$ 83,328
Annual savings for Nonjury Trials =	\$ 38,304
	\$121 632
Less Additional Costs for a Clerk 11 in Police Court Services Detail	(13,000)
Net Annual Savings	\$108 000

In practice, officers are often unable to report within the allotted time because of the commuting time required or other tactical problems. Additionally, officers indicate that they are sometimes not promptly notified of release from standby. And prosecutors, at times, are unable, because of the press of court business, to notify Court Services of case dispositions as they occur.

The standby program requires the full support and the active cooperation of all participants in order to function properly. Periodic communication between police, prosecutors, and the court would assist in the identification of problems and the development of solutions in a timely fashion. In addition, the following suggestions may strengthen procedures:

Prompt commencement of court proceedings and early decisions on case action could increase overall program efficiency.

Those officers who do not live within a 40-minute radius of court should be granted more time or not placed on standby.

Additional phone lines may be needed in Court Services to efficiently respond to the peak volume of calls. Court Services may also need to implement additional steps to ensure that all officers receive prompt notification of case disposition.

Recommendations

Staff recommends that the chief presiding judge, under the authority of Chapter 11, Article 111, Section 2-83, City Code, implement the court proposal to extend the police court standby program to all divisions of the court for jury trials and reduce standby program coverage for nonjury cases at an adequate level to determine if the procedural recommendations will alleviate the delays now encountered in some trials. Staff further

recommends that the procedural suggestions outlined above be implemented by the court and the police department respectively. Police Court Services should continue to collect data elements necessary for analysis of standby program results. Such an analysis should be conducted after six months of experience with the extended program to assure cost savings warrant continuation.

Fayetteville: A Case Study in Pricing a Service

Many local governments face the problem of determining an equitable service charge: a charge that is as fair to the recipient of the service as it is to the taxpayers who must subsidize the difference between the charge and what it actually costs to provide the service. Unfortunately, local government accounting practices which focus on guaranteeing compliance with applicable local, state, and federal charters and laws generally do so at the expense of developing methodologies for using accounting data for management purposes. As a result, many governments set fees arbitrarily, without an effective estimate of the actual cost of providing the service.

Since a number of states now require that the charge for a service be based on the cost of providing the service, it is increasingly important that local officials develop the ability to price services in a fashion that reflects all the costs of providing the service and yet is not unduly burdensome.

Recently, a small municipal government undertook a study designed to cost and price a major activity of its planning function. While the name of the city has been changed, this case study is closely modeled on the actual process used to determine an appropriate fee for that planning service. Many of the data that are presented come directly from city documents, and the discussions of city activities reflect the views of the city officials involved.

Background

The City of Fayetteville is located 25 miles from a large metropolitan center. Its 21,000 residents are served by several bus lines and by a rapid transit station located in the downtown section of the city. Incorporated in the late 1960s, Fayetteville's 13 square mile area is spread over a number of sometimes steep hills.

As a matter of policy, the city contracts out nearly all services, including police, fire, and public works. Thus, although the budget is nearly \$3.5 million, the city has only 17 employees, of which nine are full-time positions.

The single most significant factor in the decision to incorporate was a desire for greater local control over land use due to dissatisfaction with the county's handling of this function. Since incorporation, the city has maintained an active in-house planning function which devotes considerable attention to overseeing land use.

Pricing the Processing of Land Use Entitlement Applications

Due to the fiscal constraints brought on by declining local revenues and reduced state aid, the city decided to establish a service charge for processing land use entitlement applications, a major activity of the planning function. Local officials decided that, since the amount of time devoted to processing these applications varied considerably, an equitable service charge should be based on the number of hours spent processing a given application. City officials felt, however, that the rate per hour should include more than just the direct labor charge.

Since the planning activity paid rent, mileage expenses, utilities, and so forth, each of which supported all planning functions, it was appropriate that a portion of these costs be borne by those who submitted land use applications. Further, the planning function itself was supported by other municipal activities which were financed by other city departments.

It was decided that the city should recover a reasonable share of its overhead costs, as well as the direct costs of providing the service.

The city used the process outlined below to determine the fee to be charged.

I Determine the Governmental Overhead

- Determine overhead activities
- Establish if it is necessary to directly allocate a part of an overhead activity to the planning function
- Determine the bases for each allocation of overhead

II Determine the Departmental Overhead

- Establish the service functions of the department
- Determine if any part of departmental expenditures should be “transferred” to governmental overhead
- Determine the bases for allocating departmental overhead to service functions
- Determine how the individual service functions benefit from overhead activities

III Set A Total Cost Rate

- Determine the number of hours to be directly charged
- Determine total overhead to be recovered
- Determine the service's cost
- Calculate the average hourly direct wage
- Calculate the average hourly overhead cost
- Total the direct and overhead rates

Exhibit 17 City of Fayetteville Annual General Fund Expenditure Summary	
Department	Annual Expenditure
City Council	\$ 3 900
General Administration	483 480
City Attorney	50 000
Planning	198 925
Organization Support	1 200
Parks and Recreation	446 700
Open Space	1 500
Traffic	34 350
School Crossing Guards	11 200
Senior Citizens	41 675

Meals for the Elderly	8 000
Community Development	207 000
Community Promotion	13 000
Elections	3 000
Insurance	39 200
Police	795 200
Parking Enforcement	19 650
Crime Prevention	4 700
Engineering	82 600
Public Works	844 150
Walkways	100 000
Parking	39 030
Total	3 428 460

The basic approach consisted of three steps: 1) estimating the amount of organizational overhead to be recovered by the service charge; 2) estimating the amount of departmental overhead to be recovered by the service charge; and 3) estimating the number of hours devoted to the service. Dividing the number of hours devoted to processing land use entitlement applications into the total of organizational and departmental overhead to be recovered by the service charge gives the hourly overhead rate which, when added to the direct hourly charge for time devoted to the applications, gives the hourly charge for processing applications.

The first step in estimating organizational overhead was to examine the total city budget (Exhibit 17). The budget presented is a gross budget in the sense that all municipal activities are presented in the general fund budget. The few additional funds that the city maintains to fulfill legal requirements are for accounting purposes only and thus reflect activity already presented in the general fund. In addition, the city maintains no enterprise activities.

The examination of the total city budget suggested several possibilities for further identification of overhead activities as seen below. Before any of these activities were actually included in the estimate of organizational overhead, each was reviewed to determine whether the activities being financed were actually of a general benefit to the organization as a whole, rather than of particular benefit to one or a few municipal functions.

Governmental Overhead Activities (First Estimate)	
City Council	\$ 3 900
General Administration	483 480
City Attorney	50 000
Organizational Support	1 200
Elections	3 000

Insurance	39 200
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City officials who were knowledgeable about the budget quickly pointed out that both the general administration function and the city attorney function contained elements that perhaps were inappropriate for inclusion in general organizational overhead because they were principally of benefit to specific functions; their inclusion in these budgets had been primarily for the sake of convenience.

The budget for the city attorney consisted of two components: a flat retainer (\$16,000) for opinions rendered to the city during the year, and an estimate of the cost of the time that would be devoted to the city's litigation. City officials pointed out that since most of the litigation was related to planning activities, a major fraction of this \$34,000 expense should not be considered general overhead at all but rather should be included in planning overhead. The city attorney provided an estimate that 70 percent of litigation expenses were planning related, so it was decided to transfer \$23 800 ($\$34\ 000 \times .7$) to planning overhead.

City officials indicated that the budget for general administration (Exhibit 18) contained seven items that were of significant and measurable benefit to the planning function: telephone, postage, office supplies, rent, small tools and equipment, equipment maintenance, and equipment rental. It was decided to allocate a portion of each of these costs to the planning function based on estimates of the benefits received. Telephone expenses were allocated based on the number of handsets (planning had six of a total of 10); rent was allocated based on space used (planning used 45 percent of the space). The remaining items were lumped together and allocated based on the number of employees in planning (five of a total of 17), since they were perceived to be a function of the activity of individuals working for the city. The results are shown below. Total expenditures of \$17 860 are indicated as applicable to the planning function.

City of Fayetteville Adjustments to General Administration Expenses			
Expense Item	Allocation Base	Allocation Fraction	Transferred Amount
Telephone	# of handsets	6/10	\$3 000
Rent	area	9/20	\$6 210
Postage	# of employees	5/17	\$ 1 500
Office Supplies	# of employees	5/17	\$4 400
Tools/Equipment	# of employees	5/17	\$150
Equipment Maintenance	# of employees	5/17	\$650
Equipment Rental	# of employees	5/17	<u>\$1 950</u>
Total			\$17 860

<p>EXHIBIT 18 City of Fayetteville General Administration Expenditures</p>

Permanent Employees	\$135 430
Temporary Employees	500
Overtime	500
Fringe Benefits	28 000
Telephone	5 000
Old Age Survivors Insurance	7 700
Publications	750
Postage	7 000
Office Supplies	13 000
Conferences and Meetings	3 000
Auto Mileage	3 500
Rent	13 800
Membership Dues	5 000
Small Tools and Equipment	400
Contractual Services	8 000
Equipment Maintenance	2 200
Equipment Rental	8 000
Miscellaneous	1 500
Legal Advertising	1 500
Employee Training	200
Commissions Day	3 500
City Office Relocation	200 000
Micro-Computer/Word Processor	20 000
City Manager Recruitment/Employment	<u>15 000</u>
Total	\$483 480

The general administration budget also contained a sum of \$200,000 for the purchase of a new city hall. Since the benefit that would accrue from this expenditure would be received over a long period of time and should be recovered in the future as depreciation, it was decided to remove this item from general organizational overhead. (Also, since this is a capital expenditure and not an operating expenditure, it should be removed from the budget as well.) The resulting organizational overhead — shown below — is \$341,820.

Governmental Overhead Determination (Second Estimate)	
City Council	\$ 3 900
General Administration	483 480

City Attorney	50 000
Organizational Support	1 200
Elections	3 000
Insurance	<u>39 200</u>
Total	\$580 780
Less Reductions	
from General Administration	217 860
from City Attorney	23 800
Plus Additions	
General Plan Amendments	2 700
Net General Overhead Activities	\$ 341 820

The next step in the costing process was to determine the overhead portion of the planning budget that should be recaptured with the proposed service charge. After examining the planning budget, three items were deemed inappropriate for full inclusion in planning overhead for the applications processing function: permanent employees, contractual services, and general plan amendments.

Planning Department Expenditures With Items Included	
Permanent Employees	\$ 122 500
Overtime	2 000
Fringe Benefits	18 400
Electricity	400
OASDI	7 650
Publications	125
Conferences and Meetings	1 000
Auto Mileage	1 350
Rent	1 300
Membership Dues	300
Contractual Services	40 000
Miscellaneous	350
Legal Advertising	350
Employee Training	500
General Plan Amendments	<u>2 700</u>

Total	\$ 198 925
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Since the city had decided to use a service charge that was based on the number of professional staff hours required to process an application, the salaries for these employees were not appropriate for inclusion in the overhead. The nonprofessional staff salaries (\$43,200) were left in planning overhead. Further, the three professional staff members did not devote all of their time to processing applications; an average of 80 percent of professional time was devoted to processing applications, so only a portion of the permanent salaries — \$10,800 ($\$54,000 \times .2$) — was included in planning overhead.

The estimate for contractual services, \$40,000, contained an estimated \$4,000 for fees paid to the county for verification of some information contained in land use entitlement applications. Since it was the city's intent to recapture this sum directly from the applicants, only \$36,000 of this item was included in overhead.

The general plan amendments item was described as an activity required of all local governments in the state but was not utilized by the city in any significant way. For this reason, it was decided to transfer this sum, \$2,700, from planning overhead to general governmental overhead. (City officials indicated that the expenditures for this purpose varied significantly from one year to the next. In the prior year, 10 times as much was spent as has been budgeted.)

The calculations below show the planning activity overhead (\$164,460).



	Total Planning Expenditures	\$ 198 925
Less	Salary To Be Directly Charged ($\$54\ 000 \times .8$)	<u>43 200</u>
		155 725
Less	Other Planning Activities ($\$144\ 925 \times .2$)	28 925
	Directly Charged Contractual Services	4 000
Plus Transfers from		

General Administration	17 860
City Attorney	23 800
Total	\$164 460

The total overhead allocated to the planning function is the sum of the planning activity's share of the organizational overhead and the actual planning overhead (\$164,460). It was decided that a reasonable basis for allocating general governmental overhead would be the proportion of total expenditures for the planning function in relation to total city expenditures net of overhead and net of capital expenditures (for the new city hall). The resulting base for the allocation is \$3,428,460 minus \$341,820 minus \$200,000, or \$2,886,640.

The total expenditures for the planning function amount to \$237,885, so the ratio of planning expenditures to total expenditures is 8.24 percent, which becomes the overhead allocation rate for the planning function. The actual dollar amount of general government overhead allocated to the planning function (Exhibit 19) is \$28,166 (8.24 percent x \$341,820).

The sum of general government overhead and planning overhead is \$192,626 (\$28,166 plus \$ 164,460). Note that not all of this sum should be recovered from the service charge for processing land use entitlement applications, because a portion of planning activities is devoted to unrelated matters. Planning officials estimated that only 20 percent of personnel time was not devoted to processing the applications, so it was decided to recover 80 percent of the overhead figure, or \$154,101 (\$192,626 x .8).

The final step in actually setting an hourly rate for the service charge was to determine the total hours that would be billed, 4,992 (2,080 x .8 x 3), and to establish the average direct labor cost per hour, \$8.65 (\$43,200 / 4,992). The fee was set to recover \$154,101 in overhead; therefore, each hour of service was billed at the sum of the direct plus overhead rate per hour. Since the hourly overhead rate was \$30.87 (\$154,101 / 4,992), the correct total per hour charged was \$39.52 (\$8.65 + \$30.87).

EXHIBIT 19	
Allocation of General Government Overhead	
Planning Expenditures	\$198,925
Less	
General Plan Amendments	2,700
Plus Expenses from	
General Administration	17,860
City Attorney	23,800
Planning Expenditures Total	\$237,885

Allocation Percentage:

$$\frac{\$ 237\,885}{(\$3\,428\,460 - \$341\,820 - \$200\,000)} \times 100 = 8.24\%$$

Allocation Amount:

$$\$341,820 \times 8.24\% = \$28,166$$

Analyzing The Process

The Fayetteville case study contains several features that are worthy of further comment. The principal resources used in conducting the cost analysis were the annual budget and the knowledge of officials involved in the function. Most cost analyses will tend to rely on these resources — as well as on any additional sources of information that may be available in the particular circumstances.

Since a budget is only a collection of estimates, what should be done if, at the end of the year, the estimates used to set the rate are found to differ significantly from actual expenditures? If the service is offered in future years, it is possible to calculate the amount of over- or undercharge and roll it into the rate for the next year. Thus, if the estimated expenditures turned out to be too high, the same item in the next year's budget would be reduced to reflect this change.

Alternatively, this year's rate might be based on last year's actual financial results instead of on budget estimates. When this approach is used, however, major increases in expenditures that should be recovered by the service charge will not be reflected in the service charge until a year has elapsed.

One other concern is the potential effect of the imposition of a \$39.52 per hour charge on a service that had been free. Since providing the service is a major activity in the planning office, a sharp swing in demand could have many repercussions.

City officials had regarded some percentage of this activity as unnecessary, because landowners were in the habit of filing frivolous contests of applications made by their neighbors. These contests required repeated rehearings, re-examinations, and public hearings, and they delayed the application approval process considerably. (For example, one contest of the calculation of the slope of a plot of land resulted in nine months of hearings and deliberations.) It was hoped by city officials that the imposition of a fee would reduce the number of such contests.

City officials planned to reevaluate the service charge after three and six months to assess its impact. If major changes developed in the demand for the service, the causes of these changes and their effects on the planning office would be assessed at that time.

The City of Dayton, Ohio: A Case Study In Costing New Services — Marginal Cost Analysis

While the most effective cost concept for examining the prices of existing municipal services is total cost, the cost concept that is most useful in examining new or expanded services is marginal cost. Marginal cost concentrates attention on the additional expenditures required to deliver a new service or to expand an existing one. In particular, if overhead costs are relatively fixed, the marginal cost is the total additional cost for delivering a new or expanded service.

A report by Paul Mamerow, a management analyst for the City of Dayton, Ohio, follows. It discusses cost and feasibility data for the possible implementation of a mounted horse patrol in downtown Dayton. Interestingly, while the report is a marginal cost analysis, the term marginal cost never appears in it.

September 17, 1974

Marginal Cost Analysis

TO: Paul R. Woodie, Administrator
Office of Management and Budget
FROM: Paul W. Mamerow
SUBJECT: Mounted Horse Patrol

Recently, the city manager requested OMB to provide cost and feasibility data for a mounted horse patrol in the downtown area. The following report supplies relevant cost data and briefly outlines two alternatives for implementation.

In preparing this report, OMB contacted both the International City Manager's Association and the International Chiefs of Police Association for assistance. OMB further made contact with the Cleveland, Philadelphia, Lakewood, Colorado, and Washington Park Police Department (all of which have mounted police) and with several local stabling concerns.

Part I of this report suggests possible objectives for a mounted patrol in Dayton. Part II briefly outlines two alternatives for implementation of the mounted patrol program. Part III presents cost information for each implementation alternative. Cost detail is supplied in the Appendix.

I. Objectives

The following represent those objectives which apply to a mounted patrol program in Dayton. These objectives were arrived at through review of several mounted patrol programs operating in cities as large as, or larger than Dayton, and through consultation with Mr. Curran as to his expectations.

The objectives are stated as follows:

- To increase police visibility in the downtown area, and/or in City Parks and the river corridor when necessary.
- To enhance the innovative image of downtown Dayton.
- To provide effective traffic control to congested downtown areas, or to areas of special assignment (e.g., sporting events).

- To provide effective crowd management for parades and other social functions downtown, and in areas of special assignment.

It should be noted that the Parking Control Aid Program was implemented to partially accomplish the first objective of increasing police visibility. Furthermore, the Parking Control Aids also provide enforcement of parking restrictions in the downtown area, thus contributing partially to the accomplishment of the third objective. It should also be noted that because the major function of the mounted patrol is to increase on-the-street police visibility, the mounted patrol, like the present walking patrol, will not answer radio dispatches, especially to in-building locations.

II. Implementation

Implementations of either of the two mounted patrol alternatives outlined below will involve certain programmatic costs pertaining to the purchase, outfitting, and maintenance of horses, the training of horses and riders, the purchase of uniforms, and street cleaning. Total costs for each alternative are outlined in Part III of this report.

Not included in program cost is the cost of hiring new police personnel, since both alternatives assume the utilization of personnel already working the downtown area. Mounted patrolmen would remain under the supervision of present sergeants.

Alternative A: Daytime-Weekday Patrol

This alternative would provide two mounted patrolmen during the day, Monday through Friday. Such a program would require two police officers, and the purchase of three horses. The mounted officer would patrol primarily an area bounded by Mounted Avenue and Fifth Street to the North and South, and Jefferson and Ludlow Streets to the East and West.

This alternative would accomplish during the daytime the objectives of increasing police visibility downtown, enhancing Dayton's innovative image, and providing traffic control and crowd management when needed.

The total cost of this program alternative is \$20,650. This program alternative does not require expanded street cleaning operations since the patrol will be operative on weekdays only and this coincides with existing clean-up schedules.

Alternative B: Six-day, Day and Night Patrol

This alternative would provide four mounted patrolmen, Monday through Saturday, two working during the day and two working in the evening. Such a program would require five police officers and at least six horses.

Mounted officers would patrol primarily the downtown district as outlined above. However, those mounted patrolmen scheduled for evening patrol could be assigned to provide support for Dayton Hydroglobe (Eastwood Lake) Parks, or to areas congested by heavy traffic or crowds when necessary, or to ceremonial functions.

This program alternative would accomplish, during the daytime and night, and on Saturdays, the objectives of increasing police visibility downtown, of enhancing Dayton's innovative image, and of providing traffic control and crowd management to the downtown area, as well as to areas of special assignment. This alternative represents a total program cost of \$38,225.

III. Cost

The following represents annual costs for the two implementation alternatives outlined in Section II.

Purchase & Fitting of Horse	Alternative A	Alternative B
Purchase of horses	\$1 200	\$2 400
Riding gear	560	1 400
Maintenance		
Feed	2 190	4 380
Bedding	36	72
Farrier (blacksmith) fees	600	1 200
Veterinarian fees	125	250
Stable rental	900	1 800
Stable cleaning & grooming	4 000 - 10 465	4 000 - 10 465
Training		
Training of horses	600	1 200
Training of riders	1 850	1 850
Miscellaneous		
Trailer	950	950
Uniforms	1 140	2 850
Street Cleaning Costs	-	9 405
Total Program Cost	\$14 151 - \$20 616	\$31 757 - \$38 222

Should you have any questions concerning this matter, please advise.

APPENDIX I: Cost Detail

Horses

Cost is computed at \$400 per horse. This estimate is derived from quotes by local stable owners and several police departments currently employing mounted patrol.

Riding gear

	for five riders:	for two riders:
saddle with fittings	\$ 885	\$ 354
bridles with bits	265	106
pads	80	32

brushes and curries	35	14
breast collars	<u>135</u>	<u>54</u>
Total	\$ 1 400	\$ 560

Feed

Cost is computed at approximately \$2 per horse per day. This estimate is a rough composite figure derived by several estimates advanced by local stabling concerns and several police departments employing mounted patrol. Estimate given here is somewhat higher than those received by OMB, in order to account for rising grain costs.

Bedding

Daily cleaning of stalls for six horses requires approximately two loads of sawdust per month at approximately \$3 per load.

Farrier (blacksmith) fees

Horses working pavement require new shoes approximately once every six weeks. One set of four borium shoes is priced at approximately \$25.

Veterinarian fees

	for six horses:	for three horses:
Tetanus toxoid (1)	\$ 36	\$ 18
Flu and strangles (1)	60	30
Worming (2)	84	42
Floating of teeth (1)	42	21
Min. diagnostic fees		I
Total	\$ 250	\$ 125

Stable Rental

Commissioner Curran has indicated that the Montgomery County Fairground has committed their stables to the City for use in this program. Cost is computed at \$25 per stall per month.

Stable Cleaning & Grooming

The fairground does not provide feeding, bedding or grooming services. The upper estimate is arrived at by computing cost of hiring a stable hand (Grade 112) to do the work. The lower figure is the estimated cost of letting the work out on a contractual basis to fairground personnel.

Training of horses

Cost is estimated at \$40 per month for a five-month period. (Estimate supplied by Mrs. Tressler of Montgomery County Fairground).

Training of riders

Cost for group-rate training is computed as follows: (Estimate supplied by Mrs. Tressler of Montgomery County Fairground)

10 hours classroom training at \$5/hr.	\$ 50.00
120 hours riding training at \$15/hr.	1 800.00
Total	\$ 1 850.00

Trailer

Used, two horse trailer - \$950

Uniform Cost

Cost per patrolman supplied by the Lakewood Department of Public Safety, Lakewood, Colorado.

Summer Uniform Cost for One Mounted Patrolman		
Boots at \$50	x 2 =	\$ 100
Spurs at \$15	x 1 =	15
Pads at \$65	x 3 =	195
Gun, Belt, Holster, etc. at \$60	x 1 =	60
Lightweight Jacket at \$45	x 1 =	45
Total		\$ 415

Winter Uniform Cost for One Mounted Patrolman		
Felt Hat at \$25	x 1 =	\$ 25
Down Coat at \$100	x 1 =	100
Rain Slicker at \$30	x 1 =	30
Total		\$ 155

Total Summer and Winter Uniform Expense \$570

Street Cleaning Operation

Present street cleaning operations span a five-night, Sunday-to-Thursday-night work week. To accommodate a horse patrol active six days a week, street cleaning operations should be shifted to encompass a Monday-to-Friday night work week, and an additional four-hour Saturday night work shift should be added. Cost figures below represent additional time-and-a-half wage cost, including fringes, for a 48-hour work week.

Equipment Operator (2)	\$ 2 005
Laborer (Grade 112)	1 733
Equipment Operator (3) (Sweeper)	2 173
1/2 Equipment Operator (3) (Flusher-six months a year)	1 086
Supervisor (Grade 24)	2 408
Total	\$ 9 405

A Case Study In Evaluating Contracting Out

This case study uses the techniques that have been examined in the preceding chapters to develop procedures to evaluate the relative merit of performing a service in-house or contracting it out to the private sector. In addition, a case study reviews the evaluation of three bids for building-cleaning services. It demonstrates that fluctuation in work volume can affect the desirability of a unit cost bid.

The county¹ receives a proposal to contract out its building cleaning services for \$3.25 per square foot for any of three possible units:

- for a single county building;
- for all county-owned structures in one quarter of the county; or
- for all county-owned structures in the county.

In the first case, the building in question is an animal shelter with 10,000 square feet of area to be cleaned which currently uses the services of two fulltime custodians. The present total (direct plus indirect) cost to the county for cleaning this facility is \$4.67 per square foot.

In the second case, the contractor offers the same per square foot charge for cleaning the 809,800 square feet of county space in the northern section of the county.

In the third case, the contractor offers to clean the entire countywide space of 1,691,500 square feet for the same \$3.25-per-square-foot charge.

The desirability of accepting any one of the proposals depends on the amount of money the county will save, and which option will be less than the current total cost to the county, since not all of the total cost will be avoidable. Thus, in deciding which, if any, of the bids the county should accept, it is vital to determine first how much of the current cost can be eliminated by contracting out. To do this, the county's total cost for cleaning must be analyzed. Then it must be determined how much of this cost will be avoidable if:

- Only a single structure is contracted out;
- A section of the county is contracted out; or
- The entire county is contracted out.

Avoidable Cost: One Building (Case One)

The total in-house cost for cleaning one 10,000-square-foot building is \$4.67 for each square foot — considerably more than the \$3.25 per square foot the vendor proposes to charge. From the county's perspective however, the key question is: if the cleaning of this single structure is contracted out, how much of the \$4.67 per square foot cost will the county be able to avoid? If the county could avoid \$4.00 per square foot of this cost, then it will save \$.75 per square foot — the difference between the new county cost of \$3.92 (\$3.25 + \$.67) and the current county cost of \$4.67. If the county could only avoid \$2.00 per square foot of its current cost, however, the county would actually lose money by contracting out because the new cost per square foot would be the UNavoidable cost

¹ What follows is excerpted from a case study of the financial aspects of a make or buy decision that was prepared by the Audit Division of the Auditor-Controller's Office of the County of Los Angeles, California. The author is indebted to them for permission to use this material.

(\$2.67 per square foot) plus the contract cost (\$3.25 per square foot), or \$5.92 per square foot.

In order to determine the avoidable cost, information is needed on the direct and indirect costs of the service and on how they are calculated. Case One below shows a breakdown of the county costs associated with the animal shelter. As indicated, all of the direct cost could be saved by contracting out, but none of the indirect cost could be saved, since none of the overhead activities would be significantly altered by contracting out one building and eliminating two custodial positions.

The County's Indirect Costs

Four levels of county overhead are shown in the following table: division, branch, department, and countywide. Each division is responsible for cleaning specific county structures, with all four divisions reporting to one branch — building cleaning. The Department of Building Services itself has two other branches.

A multileveled county organization would typically use a step-down allocation process similar to the one discussed in Chapter 4. In this case, it was decided to use an allocation process based on salaries and wages instead of one based on a percentage of the budget (a fairly common choice). Thus, the overhead entries in the full cost column are all based on the \$20,000 of direct salaries and wages for cleaning the structure; for example, the \$1,683 of branch overhead is calculated by multiplying the branch overhead rate of 8.413 percent times the \$20,000 of direct salaries.

Case One: 10,000 square feet		
Type of Costs	Full Cost	Avoidable Cost
Direct Costs:		
Salaries and Wages	\$20,000	\$20,000
Employee Benefits (@21.25%)	4,250	4,250
Services and Supplies	2,000	2,000
Direct Cost Subtotal	\$26,250	\$26,250
Indirect Cost:		
Division Overhead (@57.508%)	\$11,502	\$0
Branch Overhead (@8.413%)	1,683	0
Department Overhead (@22.259%)	4,452	0
Countywide Overhead (@13.958%)	2,792	0
Indirect Cost Subtotal	\$20,429	\$0
Total Cost	\$46,697	\$26,250
Cost Per Square Foot	\$4.67	\$2.63

Make Or Buy?

Under the circumstances it would not be in the financial interest of the county to contract out the cleaning of the two buildings in question since it would incur a new cost (for the contract) of \$3.25/sq. ft. and would only save \$2.63/sq. ft. (\$26,250 in avoidable cost

divided by 10,000 sq. ft.). Under these conditions the county would be best advised to continue providing the service with in-house personnel.

On The Other Hand...

To only look at numbers is to ignore a number of issues that can be fully as important as the dollars and cents. Without attempting to suggest the answers, a few questions for consideration, are:

To look only at numbers, however, is to ignore several issues that can be as important as the dollars and cents. Without attempting to suggest the answers, a few questions that might be raised are:

- Will the county be required to provide a significant cash payment for fixed assets in the near future if it continues to provide the service in-house?
- Are labor saving devices available?
- Are the necessary number of employees already hired? If not, contracting out provides one method for the county to maintain a reduced work force, which, in the long run, may be more economical.
- Is this full cost comparison between county services and private sector services (\$4.67 per square foot versus \$3.25 per square foot) an indication that management at Building Services needs to review supervisor/staff ratios, productivity, etc., or is the price offered by the private sector unrealistic (a “low ball” bid to gain access to the market)? Does the comparison indicate that certain costs on a countywide basis need to be reduced through management actions?

Avoidable Cost: The Northern Section (Case Two)

In the second case, the vendor proposes to clean the northern section of the county (equivalent to two divisions) for the same rate of \$3.25/sq. ft. What are the avoidable costs in this situation?

In the second case, the vendor proposes to clean buildings in the northern section of the county (two divisions) for the same rate of \$3.25 per square foot. What are the avoidable costs in this situation?

Note that:

- direct costs are much larger because of the greater area proposed to be contracted out (809,800 square feet compared to 10,000 square feet);
- division overhead is presented as salaries, wages, and benefits for division personnel rather than as a rate since it can be considered as a direct cost of cleaning the two divisions;
- although branch, department, and countywide overhead rates are unchanged, the larger actual dollar amounts reflect the larger size of the program under consideration; and

- avoidable costs are now possible at division, branch, department, and countywide levels.

The savings of \$544,181 in salaries and wages and \$115,638 in employee benefits (for a total savings of \$659,819) is now possible because, if the entire workload of two divisions is contracted out, the contractor will be providing his own support and the county will not have to.

The savings of \$544,181 in salaries and wages and of \$115,638 in employee benefits —

Case Two: 809 800 square feet		
Types of Costs	Full Cost	Avoidable Cost
Direct Costs:		
Service Provision		
Salaries and Wages	\$1 147 353	\$ 1 147 353
Employee benefits (@21.250%)	243 813	243 813
Services and Supplies	<u>400 000</u>	<u>400 000</u>
Subtotal	\$ 1 791 166	\$ 1 791 166
Division Costs		
Salaries and Wages	\$ 544 181	\$ 544 181
Employee benefits	115 638	115 638
Services and Supplies	<u>0</u>	<u>0</u>
Subtotal	\$ 659 819	\$ 659 819
Direct Cost Subtotal	\$ 2 450 985	\$ 2 450 985
Indirect Cost:		
Branch Overhead (@8.413%)	\$ 142 309	\$ 61 000
Department Overhead (@22.259%)	376 519	35 000
Countywide Overhead (@13.958%)	236 104	100 000
Indirect Cost Subtotal	\$ 754 932	\$ 196 000
Total Cost	\$ 3 205 917	\$ 2 646 985
Cost Per Square Foot	\$ 3.96	\$ 3.27

for a total savings of \$659,819 — is possible because, if the entire work load of the two divisions is contracted out, the county will not have to provide support services for these divisions.

With such a large portion of the work of the branch being considered for contracting out, it is natural to inquire if all of the support staff still would be needed. The county determined that positions for two training coordinators and one secretary would no longer be

necessary. The savings from this proposed action — \$61,000 — are listed in the branch line of the avoidable cost column.

The \$35,000 savings at the departmental level arise from the fact that one accountant position and one payroll clerk position at this level would be unnecessary. The elimination of the work of two divisions would also result in a savings of \$100,000 in space costs that were included in the countywide overhead.

Make or Buy?

The total avoidable cost is now \$2,646,985 or \$3.27 per square foot (\$2,646,985 / 809,800 square feet). Thus, if the county contracts out the cleaning function in the two regions, it will save \$.02 per square foot, or \$16,196 (\$.02 times 809,800 square feet).

Given the problems inherent in a massive contracting out effort, the savings indicated seem too small to justify the effort — unless a multi-year contract were under consideration and it could be shown that the savings in future years would be significantly greater. Since our case study contains no such indication, the most likely result of this analysis — all other things being equal — would be to continue to provide the service in-house.

On the Other Hand...

The consideration listed at the end of the preceding case apply to this case as well. In addition:

- What would the county do with the direct labor force to be eliminated? Layoffs may result in higher unemployment benefits costs or severance costs. Absorption may increase net county cost unless the positions had to be filled in any circumstance.
- What additional costs for monitoring vendor compliance with contractual obligations will be incurred by the county? Will these additional costs offset any potential savings?
- Can the contractor provide the quality of service required? The vendor earned a profit cleaning animal shelters at \$3.25 per square foot. However, the northern section of the county includes several hospitals. The cost for cleaning a square foot of a hospital is significantly higher than that for an animal shelter. Did the contractor consider this in the estimate? If not, will the contractor be able to continue in business for the duration of the contract while providing the required level of service?
- What will the county do with its fixed assets previously utilized in the northern section?
- Could adoption of a contract for the northern section of the county stimulate the remaining in-house cleaning force to be more productive and stimulate competition between the vendor and the county employees, or would the adoption be detrimental to the work force morale?

Avoidable Cost: The Entire County (Case Three)

In the third case, contracting out the cleaning of all county structures (1,691,500 square feet), it is possible to gain greater savings since it becomes possible to eliminate even more overhead support costs.

In this case, the dollar figures for direct cost, division overhead, branch overhead, department overhead, and countywide overhead are all higher than the previous cases due to the increased scope of the work proposed. More importantly, all avoidable costs increase because the county will not be obliged to provide as much support to the cleaning effort. In particular, branch overhead is now completely avoidable because the contractor is assuming that responsibility as part of the contract. However, the avoidable costs for department overhead and countywide overhead are less than the respective full costs because both the department and the county have fixed obligations such as leases, which will not be eliminated because of the contract.

Case Three: 1,691,500 square feet		
Types of Costs	Full Cost	Avoidable Cost
Direct Cost:		
Service Provision		
Salaries and Wages	\$ 2 145 817	\$ 2 145 817
Employee benefits (@21.250%)	455 986	455 986
Services and Supplies	950 000	950 000
Subtotal	\$ 3 551 803	\$ 3 551 803
Division Costs		
Salaries and Wages	\$ 1 017 745	\$ 1 017 745
Employee benefits	216 271	216 271
Services and Supplies	0	0
Subtotal	\$ 1 234 016	\$1 234 016
Branch Cost		
Salaries and Wages	\$ 219 506	\$ 219 506
Employee benefits	46 645	46 645
Services and Supplies	0	0
Subtotal	\$ 266 151	\$ 266 645
Direct Cost Subtotal	\$ 5 051 970	\$ 5 051 970
Indirect Cost:		
Department Overhead (@22.259%)	\$ 753 057	\$ 600 000
Countywide Overhead (@ 13.958%)	472 209	350 000
Indirect Cost Subtotal	\$ 1 225 266	\$ 950 000
Total Cost	\$ 6 277 236	\$ 6 001 970
Cost Per Square Foot	\$ 3.71	\$ 3.55

Make or Buy?

The avoidable cost in this case is \$6,001,970, or \$3.55 per square foot (\$6,001,960 / 1,691,500 square feet). This figure for savings compares favorably to the cost of contracting out the service (\$3.25 per square foot) and leads to an assumed savings of \$507,450 (\$0.30 per square foot savings times 1,691,500 square feet). This savings is considerably larger than the savings calculated in the previous case, mostly because of the increased per-square-foot savings (from \$0.02 per square foot to \$0.30 per square foot) and partly because of the increased number of square feet involved (from 809,800 to 1,691,500). Under the circumstances, contracting out would appear to merit further investigation.

On the Other Hand...

Additional considerations to be factored into the final decision include the considerations from the preceding cases and the following questions:

- If the vendor fails to fulfill the contractual obligations, is the county prepared to assume the function again?
- What is the total cost of the service over the life of the contract versus in-house cost if the proposed contract exceeds one year?
- What is the vendor's track record for delivery of quality service, financial condition, etc.?

In the final analysis, contracting out a service is a complicated management problem that has a significant financial component and several other major components, such as personnel and quality of service, that cannot be ignored. Only when all relevant factors are included in the decision process is the resulting decision likely to be the best one possible.