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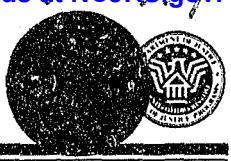

National Institute of Justice / *Research Report*

What Price Justice?

A Handbook for the Analysis of Criminal Justice Costs

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James K. Stewart

Director

What Price Justice?

A Handbook for the Analysis of Criminal Justice Costs

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Preface

Many kinds of information are used in public-sector decisionmaking. In activities dealing with human services, many data may be brought to bear in making choices. Client performance, outcomes, staff interventions, well-being of staff and clients, community attitudes about the program, training and experience potential—these are but a few of the many variables that enter the equation by which we judge public programs.

Of late there has been renewed interest in the economics of public-sector programs. Declining revenues and taxpayer concern about waste in government activities have given rise to increased scrutiny of proposed and existing programs that in a more beneficent past might have gone unnoticed. Thus a primary decision is the economic performance of a program; there is current interest in the costs, effectiveness, and benefits of undertakings that directly use taxpayer moneys for their existence.

The purpose of this manual is to describe a methodology for estimating the unit costs of steps in the criminal justice process. As such, the manual complements and enhances earlier documents that have focused on the costs of a component of the criminal justice system (e.g., courts, police) or have described the various types of economic analysis available to criminal justice researchers.

This manual has been formulated in light of the need of better information for policy decisions and agency managers' requirements to economically justify their operations to elected officials and citizens. Unlike other "how-to" volumes, which have addressed either the task of gleaning the costs of a single agency or the intricacies of the techniques of cost analysis, this report focuses on the more complex task of applying those techniques in the actual context of criminal justice events. Most of the examples were selected from a large-scale cost analysis project funded by the National Institute of Justice. The project provided national baseline information on offender processing costs by compiling and estimating fully loaded costs in four U.S. jurisdictions using common assumptions and methods. This National Baseline Information (NBI) Project was conducted by three research organizations. The Jefferson Institute for Justice Studies (Washington, D.C.) was responsible for project administration and data collection for prosecutors; Research Management Associates (Alexandria, Virginia) for constructing criminal justice flows and analyzing police costs; and the Institute for Economic and Policy Studies (Alexandria, Virginia) for analyzing costs for courts, sheriffs, probation and parole, and State corrections.

This manual makes two major departures from earlier work: first, it not only estimates the cost of criminal justice events, but illustrates the interdependence of the various parts (police, courts, corrections, etc.) of the criminal justice system. The interdependence exists to a degree that may be surprising and we begin to see why costs often seem intractable or very high for the services rendered. Second, the method of presentation is in the form of a play with a cast of characters and newspaper headlines one might encounter in the real world. This personalization came about because criminal justice is, after all, a system of people—enforcers, offenders, victims.

Who should read this manual? First, almost anyone with even a passing interest in the magnitude of criminal justice processing costs—there are indeed some surprises. Second, and more important, the techniques and information are intended to be of use to planners and budget analysts working for county administrators, city managers, justice agency heads, city/county criminal justice coordinating councils, and councils of governments. While professional budget analysts will be familiar with the cost concepts presented, they may be less aware of some of the places where criminal justice costs are hidden. Criminal justice professionals, on the other hand, will be familiar with justice process terminology but benefit from the costing approaches.

Again it is stressed that this document should complement others, and that the information contained herein, based as it is on a national project, represents one approach to costing criminal justice services. The reader is encouraged to overlay the data and techniques in his or her own jurisdiction.

Chapter 1: Introduction


The City Tribune

Local News

Offender Processing Costs Total More Than Value of Stolen Goods

Police Break Bicycle Ring Led by 13-Year-Old

We may never encounter a headline such as the first one; nevertheless, it accurately reflects the general magnitude of the cost of processing offenders in the United States.

- How much does it cost to arrest, try, and convict an offender?
- What criminal justice system parts (components) are involved?
- What do we have to know about the system to estimate costs?
- Can costs be controlled?

These and many other related questions are often asked not only by analysts but by the general public as well.

In the following pages, a methodology is presented for estimating offender processing costs. The approach involves some real people who relate to the criminal justice system as employee or offender.

The reader of these pages is taken on an analytical tour of the criminal justice system. He or she will learn not only the technical niceties of estimating capital costs, but also more utilitarian information on how criminal justice events take place. The data and processes were captured in the National Institute of Justice project to provide *national baseline information* on offender processing costs. It is referred to throughout this text as the NBI Project. We have adopted a story approach, as opposed to the more conventional structure found in most manuals. The context of the analysis is cast in the form of a play, with the various characters serving as focal points as we learn more about criminal justice processing costs. Hypothetical newspaper headlines set the tone for revealing information contained in every chapter. Criminal justice costs are incurred for real people committing real crimes and being part of real events. This manual personalizes the process and, we hope, creates a more engrossing journey.

Although the analytical techniques illustrated herein are summarized in the final act by tracking two offenders, a glimpse of the culmination is warranted before we begin. As stated earlier, the focus is on processes (e.g., booking, trial) rather than discrete components (e.g., police, courts) of the criminal justice system. This was the NBI Project approach—one of several available to the analyst. In order to more fully appreciate this approach, consider Exhibit 1–1.

Exhibit 1–1

Overview of criminal justice system activities

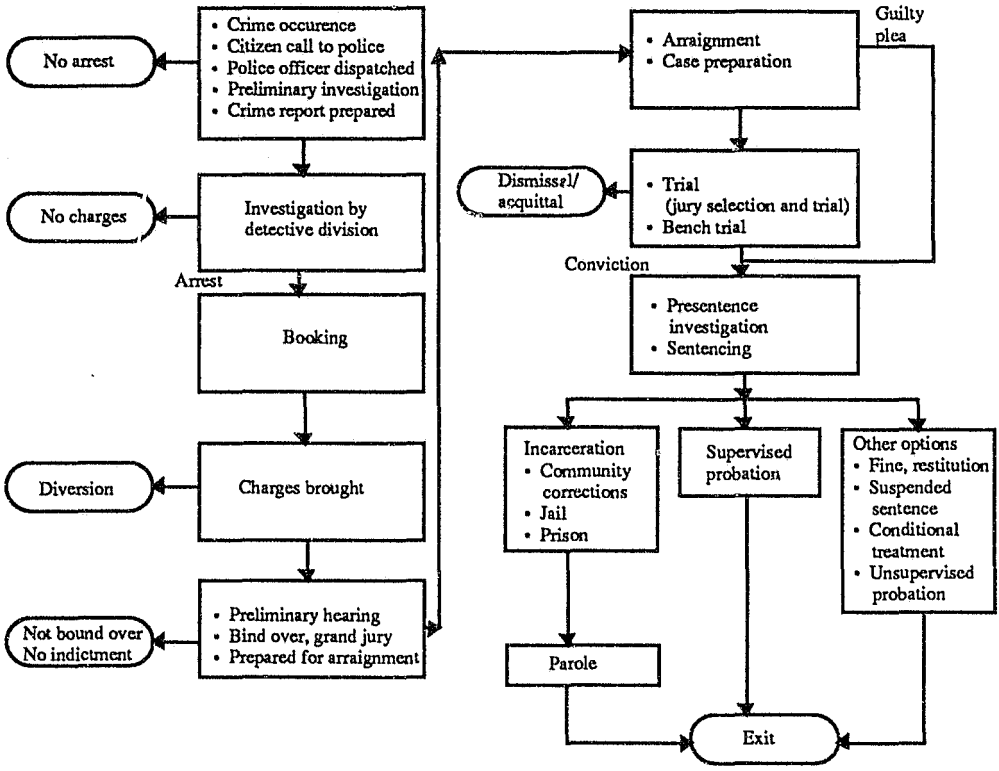


Exhibit 1–1 illustrates a typical criminal justice flow of events from the occurrence of the crime to the release of the offender who has served a sentence (there may, however, be procedural differences in some jurisdictions, depending on the nature of the case). Two observations are (or should be) apparent from inspecting this flow diagram: (1) more than one system component may be responsible for an event (e.g., a trial may involve the police, courts, prosecutor, and sheriff); and (2) given this interaction and the complexity of the events in the flow, we expect the process to require significant resource levels.

And indeed it does! Consider the following summary of the "drama" that is played out in the pages of this manual.

The cases of John and Alice—A summary

John and Alice are only characters in our play, but the costs attendant to their actions are real and could likely be occurring for criminals in your own jurisdication. Consider the case of John, a shoplifter, who permanently borrows a few extra items at the store and is confronted by an irate shopkeeper who decides that enough is enough.

John is arrested, works through the system, and finally receives a sentence of probation. Alice, a three-time loser, takes a somewhat different trip through the criminal justice system when arrested for possession of stolen property. Alice is held in jail pending trial and undergoes a jury trial before receiving a sentence of probation. Exhibit 1–2 shows the price of justice for John and is illustrative of the costs derived from the NBI Project and developed in this manual.

Exhibit 1–2
The case of John

John's arrest and booking*	$295.44
First appearance**	156.74
Preliminary hearing and grand jury	554.85
Hearings	197.20
Plea	484.23
Sentence (preparation and supervision)	771.17
Total	$2,459.63

* Arrest includes:

Patrol response	$104.16
Patrol arrest	102.48
Detective arrest	81.00
Bail decision	7.80
Total	$295.44

** No detention, assigned counsel

These costs include not only the charges for criminal justice professionals, but also the other resources that enable them to perform their jobs: patrol cars, crime labs, courthouse rent, telephone service, supervisors, salaries, payroll clerks at the county offices, and so forth. We see the police officer or judge; what we do not see are the backup resources that enable these people to perform their jobs. John's costs—carefully derived and explained in the manual—include not only the time of our visible professionals, but also all the enabling resources as well.

And John did not use many of the available criminal justice resources—consider Alice, who does.

Exhibit 1–3
The case of Alice

Alice's arrest and booking*	$919.90
First appearance**	483.99
Preliminary hearing and grand jury	1,377.49
Hearings and motions	530.02
Jury trial	4,622.28
Sentencing	842.37
Sentence supervision	4,182.60
Total	$12,958.65

* Arrest includes:

Patrol response	$104.16
Patrol arrest	102.48
Detective arrest	81.00
Investigation	286.20
Booking	346.06
Total	$919.90

** Pretrial detention, assigned counsel

Hopefully, this brief introduction to John and Alice begins to suggest why we should be interested in case processing costs—the costs for our cast of characters to do justice.

Key concepts in this manual

There are several concepts of particular relevance to the story and this manual. They are: the case processing approach illustrated in Exhibit 1–1; cost objective; loaded resource unit; cost allocation; and distinguishing direct and indirect costs.

The **case processing approach** to cost analysis adds an essential dimension to setting crime control policy because it (1) recognizes the interrelationship of criminal justice agencies and (2) is a dynamic, focusing on people moving through the system. Public agency budgets traditionally have been the platforms upon which policy debates are staged, but one inescapable insight from analyzing case processing costs is that the

budget is a woefully inadequate instrument for setting crime control policy. Health, public assistance, education, waste management, and other policy areas are concentrated administratively and politically. Criminal justice, however, is diffused between levels and branches of government, between elected and appointed officials, between agencies. It serves diverse, sometimes opposing, constituencies. Therefore, attempts to "get tough" or "be more humane" by adding money here or eliminating a budget item there are repeatedly thwarted by value differences, parochial interests, and conflicting incentives. Granted, the police, jail, judge, and prosecutor depend on each other to process cases: delays at booking keep officers from the street; court congestion increases police overtime expenditures; last minute plea agreements destroy court calendars. These same agencies are independent, however, when it comes to the budget process. Probably the most that policymakers can hope to achieve by the resource allocation process alone are some productivity improvements in specific agencies or their subunits.

A **cost objective** is any activity for which a separate measurement of cost is derived. The NBI Project used the following set of cost objectives which relate to the case process flow:

- Response to citizen complaint.
- Onview arrest.
- Booking.
- Bail/bond decision.
- Appointment of counsel.
- Jail commitment.
- Investigation.
- Case screening and charging.
- Prisoner transport to court.
- Court lockup.
- First appearance.
- Preliminary hearing.
- Indictment.
- Motions.
- Plea.
- Bench trial.
- Jury trial.
- Appeals.
- Presentence investigation.
- Probation supervision.
- Jail incarceration.
- Prison incarceration.

Cost objectives can be precise or general as the analysis requires. The application of analysis to these types of cost objectives does not limit the information to a single agency, and clarifies the many interdependencies between criminal justice organizations. It can help agency managers identify the services they provide to others and the proportion of their budget that is in some ways beyond their control. Cost objectives, which are always selected early in the study process, serve to delineate what and how data will be collected.

A **loaded resource unit** is the dollar amount of all direct and indirect costs associated with a measure of resource use. For example, an hour (the measure) of a circuit (felony) court judge's time (the resource) is valued at $473.43 in one jurisdiction studied by the NBI Project. The following items are included in this hourly rate:

- Salary.
- Fringe benefits.
- Court clerk expenses.
- Clerical support.
- Witness fees.
- Translators.
- Travel.
- Supplies.
- Rent.
- Equipment.
- Judicial administration.
- City administration.
- State administration.

A loaded resource unit summarizes all costs associated with the use of a resource and thereby provides a convenient measure of criminal justice processing costs.

Cost allocation is the process of distributing an aggregate dollar amount to cost objectives, agency functions, or any other subdivisions of interest to the study, using measures of resource use such as time, square footage, and miles traveled. This process was especially important for the NBI Project, because the goal was to produce information on resources for both cost objectives and types of crime. This required disaggregating agencies' standard budgets into functions (e.g., arrest, investigations, case preparation, trial) and then allocating the cost of these functions to categories such as crimes against persons, property crimes, drug offenses, etc. Cost allocation was also used to distribute various types of indirect costs to resource units. (See Chapter 8: Epilog, for cost allocation principles.)

Indirect costs are incurred for a common or joint purpose, because they cannot be allocated to direct operations (as a direct cost would be), or the effort to do so would be disproportionate to the advantage of separating out the information. Since the NBI cost objectives were steps of the criminal justice process, indirect costs were estimated at the agency as well as the more common jurisdictional and State levels. Examples of such costs follow:

- Administration.
- Training.
- Planning and research.
- Fiscal management.
- Public relations.
- Information systems.

Uses of this manual

This document is intended as a guide for both large-scale analyses of total processing costs (the cases of John and Alice) and minianalyses, such as jail-day costs, hourly rates for detectives, loaded costs of prosecutors, indirect or overhead charges for the sheriff, or the real cost of capital improvements. It can also shed light on the interrelationships of the system—the various agencies and people necessary to make a trial happen, for example.

This manual also can clarify the cost of services that government agencies routinely provide to other agencies: the jail holds State prisoners awaiting transfer; police

conduct background investigations on newly hired court clerks; the district attorney defends a patrol officer in a civil liability suit. Knowing these service costs, an agency administrator can: (a) manage the cost of interagency cooperation; (b) better inform funding bodies of the budget share required for these purposes as contrasted with the core mission; and (c) more effectively bargain with peers for mutually acceptable exchange of services.

But enough. Let us join our cast of characters as they live out the drama of criminal justice system cost analysis.

Overview of this manual

Chapter 2 (Act 1) examines the most basic element of a cost analysis—the employee's hourly rate. We soon discover, however, that hourly rates give very little notion about the costs of processes. In fact, readers are perplexed to discover that a police officer supposed to cost $100-per-day is billed to the city at three times that amount. Matters improve, however, once everyone understands the concepts of a loaded resource unit and a cost objective.

Chapter 3 (Act 2) finds us enmeshed in the intricacies of Yourtown's chart of accounts identifying the direct costs of criminal justice events. This seems formidable even before we encounter the phenomena of fringe benefits, days paid for but not worked, accrued sick leave liabilities, and other arcane subjects in Chapter 4 (Act 3).

Reaching a frenzy, we tackle the most difficult cost estimating task—**capital.** In Chapter 5 (Act 4), an informed reporter blows the lid off by reporting that the new courthouse will cost $60 million, not the $20 million told the public. The analyst enters the realm of debt service, rental equivalents, depreciation, extraordinary repairs, and other topics of capital interest.

Just when we think the estimating is complete, indirect costs are introduced in Chapter 6 (Act 5). We must decide how much the mayor's office, central payroll, property management, and even some State agencies contribute to a criminal justice event.

But all stories must have a happy ending. John and Alice are arrested, booked, arraigned, tried, and convicted in the final act in Chapter 7. The hard work, media abuse, and sleepless nights pay off, as we carefully document, to the cheers of city council, the cumulative costs of processing John and Alice through the system.

Now we can leisurely leaf through the script reviewing the "points to remember," studying the glossary, and referencing sections clarifying why some seemingly obscure cost is important to policymakers.

Despite the story, the manual has some conventional parts. Each chapter is fairly generically organized and a definition as well as a statement of the relevance of the topic is offered at the beginning. The process of determining each cost element is explained in detail with the help of the example. Especially tricky areas are highlighted through the use of case study materials or "points to remember." While the chapters are intended to stand together in the formidable task of estimating criminal justice processing costs, each of them is also singularly useful for analyzing a specific cost group.

The curtain is about to rise on our drama. Your program follows.

What Price Justice?

Setting: Yourtown, U.S.A., is an affluent, eastern city of 100,000 within a large metropolitan area. Median family income is $26,000. It has an appointed city manager form of government, and an elected sheriff and prosecutor.

Crime has declined in the last 5 years to 75 Part I crimes per 100,000 population as reported in the FBI *Uniform Crime Reports* (UCR).[1] About 7,100 of the reported crimes are for property; the balance are crimes against persons. District court handles misdemeanors and first appearances; circuit court handles felonies and misdemeanor appeals.

Characters

Mary Tell	Judge, circuit (felony) court	Cameo roles:
John Wily	Prosecutor	Reporter for *Yourtown City Tribune*
Gladys Goodnight	Detective, Yourtown P.D.	Bailiff, circuit court
Lionel McGruff	Patrol officer, Yourtown P.D.	Defense counsel
John Scrooge	Property management specialist, Youreka Properties	Probation officer, Yourstate Department of Probation and Parole
"Boss" Knapp	Former mayor, deceased	
Ralph "Bud" Smythe	Sheriff, Yourtown	
John	Defendant, Yourtown	
Alice	Defendant, Yourtown	

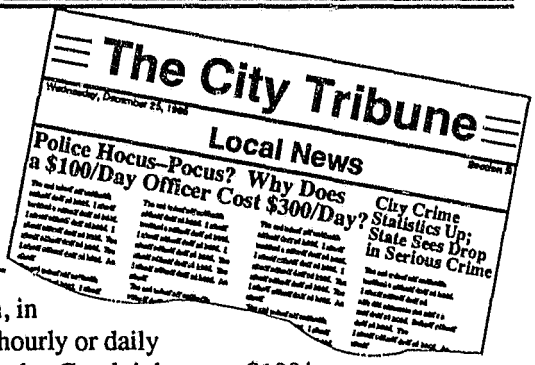
Synopsis: "What Price Justice?" is the story of a fiscal analysis of Yourtown's criminal justice system that uncovers the complexities of criminal justice processing costs.

Act 1:	"Cost objectives and loaded resource units" explains why Gladys, Lionel, Mary, and others have such hourly rates and illustrates trial costs.	Act 3:	Fringe benefits.
		Act 4:	Capital.
		Act 5:	Indirect costs.
Act 2:	Direct costs.	Act 6:	Conclusion.
		Epilog	

1. UCR tabulates and analyzes data on serious crimes such as murder, forcible rape, robbery, theft, assault, and arson.

Chapter 2:

Act 1. Cost objectives and loaded resource units


The City Tribune

Local News

Police Hocus–Pocus? Why Does a $100/Day Officer Cost $300/Day?

City Crime Statistics Up; State Sees Drop in Serious Crime

Shocking as the first headline may seem, in fact, most workers cost more than their hourly or daily rate would suggest. Police Detective Gladys Goodnight earns $100/day; but when we account for all those other costs, the bill is more than $400/day! The frustration for a taxpayer is that these other costs are not as obvious as a salary. Why does Gladys cost more than $100/day?

In order to appreciate (and estimate) all the costs of, say, an hour of Gladys' time, some concepts from Chapter 1 are reviewed here. We will then return to Gladys and her work. "Cost objective" and "loaded resource unit" (LRU) are two concepts that are central to the methodology described in this manual but are not commonplace in criminal justice system analysis. Cost objective is defined simply as "any activity for which a separate measurement of costs is derived" (Horngren, 1977). A list of typical criminal justice system activities (or cost objectives) was presented on page 5.

A loaded resource unit was introduced as all the costs required for a resource (person) to engage in some activity. An hour of a local judge's time was valued at $86 in lower court (or $437 in felony court), and included salary, fringe benefits, supplies, utilities, equipment charges, building costs, and more remote costs in the form of court clerk services, State supreme court administration, attendance at the judicial college, etc.

The complexity of analyzing these two phenomena is certainly balanced by the utility of the resultant information, but nevertheless the task requires diligence. We will spend considerable time defining our "cost objective" and "loading" our resource unit.

Determining cost objectives and resource units

Focusing on criminal justice events is useful to policymakers because the perspective is not limited to a single agency. A bench trial, for example, draws resources from nearly every segment of the system. Although budgets are constructed and approved along agency lines, the service being bought is a process flow from arrest to disposition.

Similarly, the concept of an LRU is useful because it collects resources around the professional performing the service. Stated another way, support services and administrative offices exist to enable specific resources—patrol officers, judges—to

perform their jobs, which in turn result in completion of a criminal justice event—arrest, trial. In order to determine cost objectives that make up the criminal justice system and to determine the resource units that make up these cost objectives, four broad steps are necessary.

Step 1: Construct flowchart of criminal justice process

A flowchart such as Exhibit 1–1 (simplified) should be constructed and reviewed by key criminal justice officials (e.g., patrol officers, detectives, prosecutors, clerk of the court, judge, jail commander, sheriff, etc.). An incorrect assumption at this point will affect all subsequent data collection and ultimately accuracy. For example, if you do not know that defendants must be present at all court events by State law, the sheriff's cost of transporting prisoners back and forth may be overlooked. There are two checks to see if the flowchart is too general: "Does an organization incur costs that would be missed if a step/activity is too broad?" At one NBI study site, for example, the sheriff is responsible for jury management, so simply listing "trial" is insufficient to distinguish the costs of bench and jury trials. A second check is to ask, "Are there tasks within the step that will vary by volume, time of day/month/year, case type, etc.?" Jail commitment is included in the above list because one jurisdiction studied by the NBI Project did an extensive intake interview that added over $200 to persons held over 12 hours at booking. If you are focusing on a single event (e.g., bench trial) or a single resource (e.g., Gladys), then the detail of Exhibit 1–1 may not be justified.

Step 2: Identify agencies contributing to each event

A way of picturing individual agency contributions to criminal justice events is displayed in Exhibit 2–1 on the following page. We see that more than one agency may participate in a step in the process, and that to miss these other contributions to a criminal justice event (cost objective), agency cost would understate the cost of an event (mistakenly) believed to lodge in but one agency. The importance of this for policy decisions should become obvious immediately. Consider a policy change or other agreement that increases the number of jury trials relative to bench trials. The effects of such a change transcend the prosecution/defense and even court resources and involve major resource commitments or outlays by the police, sheriff, etc. A more practical effect in the short run will be the depletion of these other agency resources from normal tasks to meet this new demand. Quality of other services will thus fall. So it is extremely important to (1) correctly identify all the agencies involved and (2) accurately and comprehensively list the resources each brings to the event (court space, police personnel, sheriff's vehicle, and so forth). Without this step the balance of the analysis will be trivial at best, misinformative at worst. The format of Exhibit 2–1 can be replicated with as much detail as necessary for any event. The two steps outlined above should be followed carefully.

Exhibit 2-1

Criminal justice agency participation in criminal justice events

	Contributing agency resources				
	Police department	Office of the prosecutor	The courts	Office of the sheriff	Prison/ parole/ probation
First appearance	Patrol officer	Prosecutor	Judge Clerk	Bailiff Deputy	—
Preliminary hearing	Patrol officer	Prosecutor	Judge Clerk	Bailiff Bailiff	—
Jury trial	Patrol officer	Prosecutor	Judge Clerk	Bailiff Deputy	—
Sentence hearing	—	Prosecutor	Judge Clerk	Bailiff Deputy	Probation officer

Step 3: Select the resource unit and "load" the costs

The loaded resource unit (LRU) is a substitute for the more familiar line item presentation of costs that keys on a single measure of resource utilization as representing all costs of interest to that activity. The most frequently used LRU is employee hours. However, the dollar value assigned to these hours is not simply salary but might include the following:

- Salary.
- Fringe benefits.
- Supplies.
- Clerical support.
- Office rent.
- Depreciation.
- Other agency costs.
- Other parent jurisdiction costs.

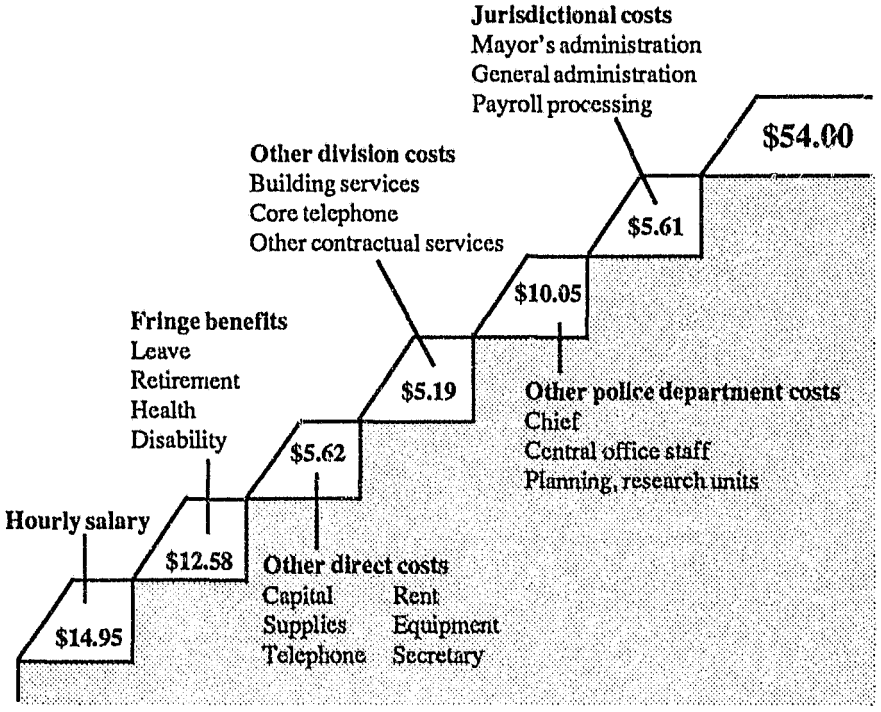
Another way to consider this is to imagine the backup resources that are necessary for a police officer—or anyone—to do his or her job. Some may believe that the only cost of an activity—from ditchdigging to criminal justice research—is the wage or salary of the human resource directly involved in its performance. To ignore other resources that enable personnel to do their jobs is tantamount to claiming that the only cost of a touchdown is the quarterback's salary. Consider the following scenario:

> Detective Gladys Goodnight spends 100 percent of her time investigating rape cases. Assume that her annual salary divided by available workdays is $100/day. Assume further that she solves one case every 10 days. You conclude that it takes public outlays of $1,000 to crack one case. Right? Wrong! There are considerable support and backup systems that enable her to do her job. These range from her vehicle to the telephone services

for the "hotline" to the research unit's work on sexual motivation to the payroll processing unit at the mayor's office to the special awareness courses she took at the training academy.

The point is illustrated in Exhibit 2–2, even though we have not yet discussed the derivation of each of the costs we are "loading on" to our detective. *Read Exhibit 2–2 from the bottom up.*

Exhibit 2–2
Loading a resource (Detective Goodnight)



As a practical matter, it will become more difficult to estimate and load costs as we move away from Gladys' direct work; and, of course, costs become less susceptible to manipulation the more removed they are from our basic resource. We continue to state that the analysis can stop well short of the mayor's or Governor's office. The utility of Exhibit 2–2 is that it provides a choice of "layers" of costs (although we do recommend being inclusive of the costs in a layer) and demonstrates how far the national baseline information study went to make our little drama possible. We might well stop when we have identified jurisdictional costs if the city has little interest in the State's share of the resource costs.

As subsequent sections will illustrate, the costs can accumulate at a rapid rate. You should not be surprised to observe a considerable multiple of Gladys' base salary costs when we add up all the costs of providing an investigatory service or breaking one case.

When estimating case processing costs, you should use as a basis the people most directly involved in performing an activity. Judge, prosecutor, bailiff, and indigent defense counsel are relevant to various court activities; patrol officer and detective to case investigations. Some examples from an eastern city are shown in Exhibit 2–3. These hourly rates reflect the types of costs listed in Exhibit 2–2.

Exhibit 2–3
Loaded rates for some criminal justice resources

	Base hourly rate	Loaded hourly rate
Lionel McGruff, patrol officer	$9.50	$33.60
Gladys Goodnight, detective	15.46	54.00
Mary Tell, felony judge	28.30	437.43
Bailiff	13.71	30.60
John Wily, prosecutor	15.70	57.18

It is important *not* to conclude from these loaded resource unit costs that prosecutors, for example, are paid almost twice as much as bailiffs. The former require more support from others who contribute to their task accomplishment. The judge is supported by a clerk of the court and occupies a new courthouse. And so forth. Finally, differences in leave policies may affect the available days our characters have for work. Chapter 4, for example, will illustrate that Gladys Goodnight uses so much leave that she only works 202 days per year! These leave costs are figured into her loaded rate (although the $100/day reflects Gladys' annual salary).

Step 4: Estimate LRU time by criminal justice event

At last we come to the direct application of all this work! The dollar value of the loaded resource units in Exhibit 2–3 are used to accumulate costs for a specific cost objective (criminal justice activity). Here we assume the activity is a bench trial for someone accused of a property offense with the above characters present.

The first steps you engaged in included the selection of the criminal justice activity to be studied, identification of the different contributing agencies, and determination of the specific professionals involved and their time contribution to the event. Once completed, these steps might produce a figure similar to Exhibit 2–4, in which you

record resources contributed to an event by various agencies—in our case here, police, courts, sheriff, and prosecutor. This work will spring from watchful observation and consultation of the flow process chart you have diligently constructed for the system and in which you accounted for all criminal justice resources by process step. You then will determine through interviews, observation, logs, time records, etc., how much time the activity in question requires from each of the above resource units. So, for example, a bench trial takes, on average, 1 hour of the judge's time. We remember that earlier, Judge Mary Tell's salary was $28.30/hour. But support services and other charges increased this rate to $437.43/hour, which is what we charge here. This exercise is performed for all professional resources involved in an event: determine their "loaded" rate; estimate the time they spend on the activity in question; multiply the two for a total cost/event. You will end up with a table like Exhibit 2–4. *Now* we know why a $100/day officer costs several times more—or why a simple trial using an hour or so of people's time costs about $650.00.

Exhibit 2–4
Resource unit time and costs by cost objective

	Bench trial cost objective (property crime)		
Resource unit	**Rate**	**Time**	**Amount**
Patrol officer	$33.60	0.5	$16.80
Detective	54.00	1.0	54.00
Felony judge	437.43	0.8	349.94
Bailiff	30.60	0.8	24.48
Prosecutor	57.18	2.5	142.95
Assigned counsel	63.57	1.0	63.57
Total			$651.74

Points to remember

Exhibit 2–4 demonstrates the end result of a complex and sometimes tedious process that begins with constructing an accurate flowchart of the criminal justice process and deciding how detailed your cost objectives will be. Once the loaded resource unit cost is obtained (Step 3) and the time required for various actors for a cost objective is determined (Step 4), these factors may be multiplied and accumulated to produce the cost of the event. Subsequent chapters will discuss the intricacies of estimating the dollar value of a resource unit; determining how many units are used by each activity; and using the results to illustrate how the decisions of many persons can affect the cost of a case.

Remember these points regarding cost objectives and loaded resource units.

1. A "cost objective" is any activity for which a separate measure of cost is derived.

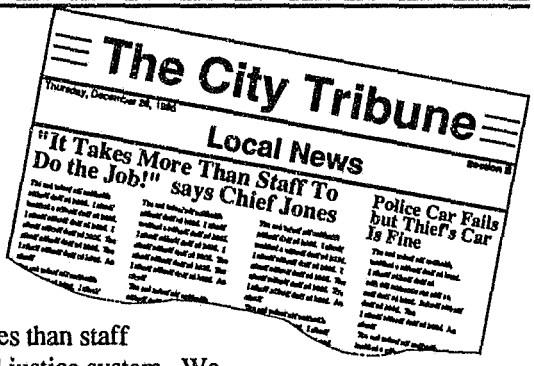
2. A "loaded resource unit" is the dollar value of all direct and other costs associated with a measure of resource use.

3. The purpose of the analysis will help identify relevant cost objectives.

4. Several agencies contribute to each criminal justice event.

5. Decisions made by one criminal justice agency frequently result in costs to another.

Chapter 3:
Act 2. Direct costs


The City Tribune
Local News
"It Takes More Than Staff To Do the Job!" says Chief Jones
Police Car Fails but Thief's Car Is Fine

As in the case of Gladys Goodnight and the other people for whom we illustrated in the last chapter how to load costs, it takes many more resources than staff to accomplish the work of the criminal justice system. We tend to imagine the people without the accompanying supplies, equipment, office space, support staff—all of which may double, triple, or even quadruple the base salary costs of our targeted resource (Gladys, John, Lionel, et al.). In this manual we learn how to derive costs and create our own loaded resource units.

This manual makes a basic distinction within public sector costs—they may be classified as either direct costs or indirect costs. Direct costs are those costs incurred for the fulfillment of a specific cost objective in the provision of a specific service or the production of a specific output. They are obviously and immediately able to be associated with the cost objective. For example, if a cost objective is "meal service," the cook's salary or raw food costs can be assigned directly. Indirect costs, which are discussed thoroughly in Chapter 6, are the costs of functions that are spread over several cost objectives—for example, a secretary serving several departments, of which meal service is only one—and are allocated in a less obvious way.

A Government memorandum[1] widely used by States and localities in claiming Federal reimbursement for direct costs defines them as "those [costs] that can be identified specifically with a particular cost objective." The memorandum goes on to identify typical direct costs that include:

- Compensation of employees for the time and effort devoted specifically to the execution of [the cost objective];

- Cost of materials acquired, consumed, or expended specifically for the purpose of [the cost objective];

1. General Services Administration, Office of Federal Management Policy, "Federal Management Circular 74-4, Attachment A," (Washington, D.C.: Government Printing Office, July 18, 1974).

- Equipment and other approved capital expenditures used specifically for [the cost objective];

- Other items of expense incurred specifically to carry out [the cost objective].[2]

Direct costs are central to our analysis. Of criminal justice events, they represent the dedicated costs of "producing" an activity or event. They by no means encompass all costs, but they represent the resources most susceptible to control by policymakers. Because indirect costs are applicable to a broader range of activities and because they are one or more steps removed from the event or activity under study, they are more problematic to analyze and control. Thus, much policy intervention will be at the level of direct costs. In this chapter we show how to estimate direct costs and to estimate how much time criminal justice professionals spend in direct, targeted, client-centered activities. A prosecutor's salary may appear in the budget as a direct cost, but only analysis will determine how much of that salary truly can be allocated to specific criminal justice objectives and how much must be distributed in a more general way.

A fairly simple way to view direct costs is to consider them as including personnel outlays and other expenditures directly associated with the provision of a specific service to a specific client. For example, the salary of a patrol officer issuing citations to specific individuals would be considered a direct cost of the citation activity. Likewise transportation costs incurred in the provision of that service would be considered direct costs. But people supervising or supporting this patrol officer are probably going to end up having part of their time "loaded" onto this officer—as well as to others—because they do not directly produce the activity of interest, in this case field citations.

Types of direct costs

One simple way to conceive of direct costs is by major economic category:

- Personnel (labor).
- Consumables (supplies).
- Buildings and land (capital).
- Equipment (capital).

Another categorization is capital/noncapital, whereby personnel and consumables would fall into the latter category and capital would be further divided into new and existing or building and equipment. Here, we will discuss labor, supplies, and capital (briefly) as they are distributed to create our LRU's.

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2. General Services Administration, p. 4.

Labor

Labor direct costs are outlays for the human resources used in fulfillment of the cost objective. They include salary and fringe benefits for all personnel whose professional efforts are targeted. They may not capture the total time of a professional resource because a person's time may be divided among several cost objectives or spent on administrative duties that could be represented as indirect costs. Basically, the type of labor we expect to see working on criminal justice system cost objectives might be the characters listed in Exhibit 3–1.

Exhibit 3–1

People and objectives

	Examples of cost objectives
Police	
• Lionel McGruff, patrol officer	Apprehension
• Gladys Goodnight, detective	Investigation
Prosecutor	
• John Wily, prosecutor	Hearings
• Defense attorneys	Trials
Felony courts	
• Mary Tell, felony court judge	Hearings
• Clerks	Trials
Probation and parole	
• Officers	Supervision
Sheriff	
• "Bud" Smythe, sheriff	Administration
• Road patrol	Detection
• Correctional officers	Confinement
Corrections	
• Counselors	Treatment
• Physicians, dentists	Services
• Chaplain	Counseling
• Custodial officers	Security

Supplies

Supplies are consumable materials such as paper, pencils, etc., which are used by both direct and indirect resources in performing their jobs. Some will fall into the category of unassignable indirect costs, but many can be directly assigned to a relevant cost objective. Crime lab supplies, for example, or office supplies for a public defender unit in a probation office would be examples of items that can be costed directly.

The objective here is not to see whether we can distinguish pencils from refrigerators but to make sure that all noncapital items are appropriately distributed. Thus the analyst needs to carefully review budget and expenditure documents and properly place the items. It is common in public-sector budgeting to see equipment and supplies commingled in the accounts. As we shall see below, capital items (like equipment) are used up slowly, over time, and should never appear as an annual or one-time expenditure. It is tempting to exclude them from the analysis rather than to correctly derive them, but this will result in an understatement of costs.

Completeness and avoidance of cost understatement were central objectives for the NBI Project. Analysts may wish to sacrifice some detail for the sake of a timely study; simply be aware of what is given up and the type of decision being made. If we are considering new office space, for example, do not omit the analysis of capital. Beware of the LCD (lowest common denominator) trap—omitting any costs that you cannot easily derive for all areas. This is also known as the hedgerow problem, where in an attempt to even out our hedges, we eventually clip them down to the ground! Go too far with LCD and you'll be back to salaries and an uninformative document before you know it.

Capital

Capital is a topic so important and critical that it will be treated fully as a separate chapter and only summarized here. The failure to distinguish capital procurement from capital consumption (or often, to make note of capital expenditures at all) in public-sector accounting is probably the major source of error in deriving accurate cost estimates. Assigning a dollar value to capital use is a difficult (but absolutely essential) task, because most financial information systems do not discern some subtle but important distinctions.

- **Land** is a capital cost that is not assigned to any government agency. There is an opportunity cost associated with public use of land, for example. This includes space for courthouses, police stations, sheriffs' offices, and the vast acreage upon which stand many prisons. This land has monetary value to the jurisdiction in alternative uses, including one-time gains from sales as well as ongoing tax revenues.

- **External costs**, such as interest on bonds, are reported as general government costs but not charged to the agency. A $100 million facility will actually cost taxpayers

three times that amount by the time the note is paid. (Issues of net present value are not treated in this document.)

- **Additions to capital stock** in agency reports (e.g., a new building or a new tractor) may be confused with maintenance of existing stock. And, in the latter case, maintenance contracts may be classified in one budget category, repair parts in another, and maintenance personnel in still a third.

- **Depreciation** of capital over its expected useful life should be calculated rather than charging the full purchase price to a single year's operating expenditures. Excluding additions to stock or an imputed annual charge for capital use will understate an agency's operating costs; including them as a lump-sum, one-time expenditure will inflate costs in the year being analyzed. These effects are particularly important when comparing agencies or looking at changes over time.

The analyst must take great care to exclude outright capital purchases from annualized figures. The *Internal Revenue Service Taxpayer Guide* has guidelines on depreciable life for many kinds of capital. A fair rent value can be imputed for most dwellings by using comparable rental figures for other structures. Capital costs must be imputed for an agency if it is under comparison with another and the second has data on capital costs. Removing the item from both agencies' accounts when data are lacking is a most undesirable way of coping and creates a less informative analysis (see note on completeness under "Supplies" above).

Direct costs

Throughout this manual the reader is reminded to allocate as many items to the direct accounts as possible. The reason is that direct expenditures give us a picture of the resources required to make an operation work. The fewer the costs we are able to assign directly, the cloudier the picture and the less useful the analysis for policy decisions. The analyst is urged continually to look behind budget categorizations and to avoid the trap of lazily grouping vague costs into "indirect" or "other" charges. Eventually there will be a pool of such charges (see Chapter 6), but the initial attempt should be to minimize these costs. The following steps lead the analyst through the tasks necessary to ascertain the direct costs attributable to criminal justice cost objectives.

Step 1: Use expenditure reports and standardize time periods

There are two key concepts to bear in mind when deriving direct costs: type of financial statement and time periods. We have stated that the best indicator of actual agency resource usage is expenditure data or annual reports. Budgets are much less satisfactory because they represent an *intent* that may or may not be realized in actual practice. Expenditure documents tell us where the money really went and are invaluable in an analysis such as this.

We recognize that there may be occasions when time is of the essence and you cannot wait for expenditure reports. Be aware that you may misassign costs because where the budget says they are going and where the expenditure reports say they *actually went* may be two entirely different matters! We would not recommend making major policy decisions using analysis based on budgets.

The analyst should always be armed with the *chart of accounts* and a description of the elements and supplements of the financial documents. The chart of accounts is a system for assigning or collecting even the most minute expenditures into specific major budget categories. An example is presented in Exhibit 3–2 on the following page.

The importance of consistent time periods cannot be overstated. Particularly in a study such as the NBI Project and for a manual such as this where we are looking at events rather than agencies per se, one must maintain a single time period. Do not use calendar years for one agency and fiscal years for another unless you can standardize across months (i.e., you might use July 1 to December 31 as the base period for two agencies, even though for one agency the period represented the beginning of its fiscal year and for another the end). Similarly, do not use the first 6 months of a year for one agency and the last 4 months of another year for a second. It is better to obtain as many financial documents as possible and to estimate from these the costs for any particular month, semiannual period, and annual period. At this point the comparison can be made.

Step 2: Use the chart of accounts

The chart of accounts (illustrated below) provides subdetail on financial reports and identifies the expenditures that fall under major categories. You may have to interchange items across categories to obtain a proper economic fit. This is especially common in capital accounts where, for example, a major purchase may be entered as "materials" because there were extra funds available in that account. If the budget is a combination of object of expenditure (salaries) and method of payment (rentals), you will need to examine each one and assign it to the appropriate category. The typology of the chart of accounts of Exhibit 3–2 may prove useful or you may wish to construct your own.

Step 3: Identify targeted resources

In this step select the human resources that contribute to the cost objective and upon which you will load other costs, as in the case of Gladys Goodnight earlier. This is a fairly obvious step; on occasion you may need to ask which personnel engage in certain activities; for example, investigation, field supervision, etc.

Exhibit 3–2

Chart of accounts

Personnel
- Salaries
- Fringe benefits
  - Social Security
  - Retirement
  - Worker's compensation
  - Health insurance
  - Life insurance
  - Vacation leave
  - Sick leave
  - Disability leave
  - Holidays
  - Clothing
  - Meals
- Professional fees
- Liability insurance

Materials
- Office supplies
- Minor equipment
- Food
- Clothing
- Linens
- Fuels
  - Gas
  - Oil
  - Kerosene
- Janitorial supplies

Services
- Telephone
- Electricity
- Water

Capital
- Equipment
  - Purchases
  - Repairs and maintenance
  - Rent
  - Debt service
  - Depreciation
- Buildings
  - Purchases
  - Repairs and maintenance
  - Rent
  - Debt service
  - Depreciation
- Insurance
  - Fire and casualty

Other
- Stipends

Step 4: Determine time allocable to the cost objective

Here the analyst uses time logs or other reporting devices to discern the average amounts of time our targeted resources devote to the targeted cost objective. It is necessary to be fairly specific here; all of an individual's time (whether spent in targeted activities or in "downtime," etc.) should be accounted for over some representative period. Logs (see Appendix) are preferable to percentage estimates.

Again, if you are going to considerable trouble to perform this cost analysis, don't taint it by skimping on the essentials. Percentage estimates given verbally by staff are acceptable in some situations. But if you really need specific time allocations, a more thorough technique is necessary. The NBI Project used logs with success. You may prefer another technique.

Step 5: Allocate direct costs

Allocation involves assigning salary, fringe benefits, and other costs to the time of our human resource. For example, if a probation officer spends one-fourth of his or her time in preparation of presentence reports, then one-fourth of the other direct costs associated with that officer (building, car, computer) are allocable to that activity. Gladys' fringe benefits, office, and so forth would all be allocable to the single activity since she spends 100 percent of her time on it. Thus we allocate direct costs first to a

person and then to an activity or criminal justice event by the time spent on that activity by that person (our targeted resource).

Points to remember

In many ways, direct costs are the most obvious and straightforward of the criminal justice system costs we will encounter on the journey through this manual and the human drama it chronicles. The costs are visible and necessary to enable targeted resources to work toward the fulfillment of a cost objective. It is important to assign as many costs directly as possible, since these are the ones most susceptible to policy control.

1. Allocation. Many of these costs are not self-evident. In addition, the previous examples are only illustrative of the various costs that could be directly assigned. It all depends on the cost objective. These costs might only be partially assigned to a cost objective. Patrol officers, deputies, or guards may divide their time between several cost objectives or criminal justice system events. A patrol officer may be involved in events of detection, apprehension, booking, and court appearance. The proportion of time will govern the assignment of cost. Time spent may be determined in a variety of ways, including logs, estimates, and the like. The objective is to understand the concept of direct costs for labor resources used to fulfill a specific cost objective.

2. Expenditures vs. budgets. Expenditure reports are much preferred over budget documents because expenditure reports tell us what actually happened. Budgets are only statements of intent, not faits accomplis. Expenditure reports also tell how the agency defines its terms: "supplies" may cover heating or motor vehicle fuel; "services" might include the telephone bill, and so forth. Practices of people over time often change the internal content of budget categories.

3. Lowest common denominators. When assigning nonpersonnel costs to create the loaded rate, consider spending the extra time necessary to allocate these charges. If policy decisions are to be made, they should be on the basis of more, not less information.

Chapter 4:

Act 3.
Fringe benefits


The City Tribune

Local News

Sick Leave Sends Agency for Transfusion

Two Men Break County Jail in Night Hours

We now turn to the first of two chapters that describe the detailed analysis of two additional components of direct costs: fringe benefits and capital. As the first headline indicates, fringe benefits, such as the referenced sick leave, can account for a substantial portion of direct costs. In many cases, there is a long-term liability to the employee that can seriously strain organizational resources—or send them for a financial transfusion.

Fringe benefits are compensation for labor other than wages and salaries. These benefits include payments for such items as the following:

- Social Security.
- Retirement.
- Life insurance.
- Health insurance.
- Worker's compensation.
- Disability leave.
- Sick leave.
- Vacation leave.
- Holidays.
- Premium pay.
- Clothing.
- Meals.
- Automobile.

There are three types of fringe benefits typically found somewhere in an organization's budget: expenditures for insurance or insurance-like services; days off from work; and providing certain services free of cost to the employee. Examples of each type respectively are grouped in the above listing. Fringe benefit items may not only be a significant proportion of labor costs but also may vary widely among agencies in the same jurisdiction; may not be included in the agency's reports; and can create a liability that only appears as an expenditure in some future accounting period (sometimes years later). Fringe benefits are commonly discussed in terms of "rates" or the percentage of costs relative to some base. In our case, the base is salary or wages net of vacation, sick, disability, holidays, or other similar days when the employees are not available for work.

There can be wide variation in fringe rates among agencies within the same jurisdiction. This situation arises for a variety of reasons. The government may not have a unified salary and wage system because agencies are funded from both State and local

sources. In one city studied by the NBI Project, the police fringe rate (funded from local taxes) was 84 percent of base salaries; the prosecutor's office was included under a statewide system that granted a 45-percent rate with local supplements optional.

Even if a jurisdiction has a unified personnel system, it may differentiate between classes of employees based on type of work (clerical/professional, trades/white-collar, risk). Public safety employees, for example, frequently receive higher retirement and disability benefits than their "low risk" counterparts (46 percent of such individuals in the NBI site mentioned above), because it is assumed these occupations are exposed to higher risks which shorten employees' effective work life. Turnover rates in agencies under a unified personnel system affect actual costs if fringe benefits are tied to job tenure. High turnover would reduce the number of persons entitled to additional vacation days and sick leave.

Why analyze fringe benefits?

There are several reasons why we should be interested in fringe benefits.

High rates

Although policymakers are seldom aware of it, it is not uncommon for fringe benefits to exceed 80 percent of salary. This lack of awareness usually stems from failure to account for the cost of leave time. Exhibit 4–1 shows one such distribution found by the NBI Project.

Exhibit 4–1
Selected fringe benefit rates

Fringe benefit item	Percent of base salary
Social Security	7.8
Retirement	45.8
Life insurance	.6
Medical insurance	7.1
Worker's compensation, medical	1.1
Worker's compensation	2.9
Clothing	1.9
Disability leave	1.1
Sick leave	2.7
Vacation/holidays	13.2
Total	84.2

Accurately calculating fringe rates becomes especially important when the analysis distributes total labor compensation to subunits, functions, and/or specific tasks within an agency. For example, senior personnel may be assigned to police officer training and recruits to patrol; benefits associated with job tenure would result in higher daily personnel costs for the former function.

Accrued liabilities

The concept of accrued liability, especially as it relates to fringe benefits, is important to both policymakers and analysts. Not only do these future claims represent substantial commitments of revenues, but they also are effectively hidden from all but the most astute.

Personnel costs in a given time period may be under- or overstated depending on the accounting practices of a jurisdiction. Understatement of costs occurs any time there is an accrued liability that is not accounted for in financial reports. For example, a government may self-insure unemployment compensation; that is, funds are not obligated at the time an employee earns a benefit but only when the expense actually occurs, which may be several accounting periods later. This accrued liability is a cost of operating the agency when the benefit is earned. A more significant example arises with unlimited accumulation of sick leave, which the employee often uses as he or she nears retirement; understatement of costs occurs when accrued sick leave for employees is omitted from the accounting, and only the payments for leave taken in a given year are reported. At the Federal level, Social Security represents a familiar case of contributions for an individual being insufficient to fund the estimated future claims against the system. These future obligations become significant when the average age of the workforce is increasing.

Comparability of rates

Comparing personnel costs between agencies and jurisdictions is affected by benefit compensation. There can be significant variation in the items that are included in fringe benefits. One agency may include a clothing allowance or disability leave that will affect benefit rates. The amount for even a common item (e.g., retirement) can vary depending on the assumed useful work life. Fringe benefit expenditures of an agency frequently are carried by a central administrative unit, such as the finance office, so an agency's standard reports would understate true costs. Group insurance plans are frequently accounted for in this way. Policymakers choose to distribute labor compensation between salaries and fringes for a variety of practical, political, and financial reasons. Analytically, however, the relevant consideration is the total amount required for personnel services that usually cannot be determined by simply looking at this line item in formal reports. Comparability of fringe benefit rates is affected (even where the costs are assigned) by variation in composition of the package and a jurisdiction's choices regarding allocation of labor compensation between salaries and benefits.

Base salary

Some fringe benefits are in the form of pay for days not worked! Gladys Goodnight, detective, has served the city for 20 years, starting as a dispatcher, attending night school, and passing the patrol officer's exam. Her dedication has been rewarded with 20 days vacation, so the sexual assault investigation team must limp along without her services for 1 work month each year. The 18-hour days worked while climbing to the top have taken their toll on her health, and she also uses all 15 days of sick leave authorized by department policy. Add 11 holidays, 5 days for training, 5 days to attend junior college part time, and a couple of "personal" leave days and Gladys' availability for work is substantially reduced.

Exhibit 4–2
Estimating workdays

Annual workdays	260
Vacation	- 20
Sick leave	- 15
Holidays	- 11
Annual training	- 5
Education leave	- 5
Personal leave	- 2
Available workdays	202

Estimated workdays becomes the starting point for calculating base salary that is used in constructing a loaded resource unit (LRU) of time. As we know from Chapter 2, Gladys' salary is conveniently $26,000 or $100 for each of 260 days:

$$\frac{\text{Salary}}{\text{Work year}} = \frac{\$26{,}000}{260} = \$100 \text{ daily rate}$$

But, she does not work for 58 days:

$$\text{Base salary} = \text{Salary} - \text{daily rate} \times \text{days off}$$

$$\$20{,}200 = \$26{,}000 - \$100 \times 58 \text{ days}$$

The $20,200 is used as a denominator (the number below the line) in calculating what percentage of Gladys' compensation is received as benefits in the form of days away from the team. Since our purpose is to estimate how much it costs for Gladys to interview a rape victim (which she only does while on duty), the concept of available workdays and its financial corollary, base salary, is the starting point for loading up the resource called "time."

Training is slightly more difficult for two reasons: requirements may vary by tenure, position, or job classification; and it may be defined to include on-the-job training where employees are performing tasks, albeit, at a less skilled level. Policy statements and interviews can be used to discover whether or not these two factors are significant enough to call for adjustments in the estimates. For example, if 75 percent of the required 40 hours of annual training is accomplished by reassignment or other on-the-job methods, it is not worthwhile to remove these costs from salaries and add them to the indirect costs. Variation in required hours should be accounted for, particularly if you plan to distribute costs to subunits (e.g., patrol) and/or activities (e.g., preliminary investigations).

Estimating vacation costs

Calculating fringe benefit costs is reasonably straightforward with the exception of days away from the job such as vacation, sick leave, and disability. In calculating base salary, these items were removed to determine the actual work year; here, they rejoin personnel costs in the form of benefits.

It is likely that leave days will vary by type of employee. The analyst should use employee-specific data unless the days are very close (e.g., 20 days for one set of employees, 18 days for another). Overall averages may save time but they will always reduce the reliability of the answers. The choice is the analyst's and depends on what the study at hand is intended to accomplish. See the comparison of methods below.

Method 1: Residuals

If all benefit costs are included in agency reports, then the most difficult estimation problem is determining the number of days different employees are not available for work. (The daily cost of this time is simply salary divided by number of days in the work year, such as 261.) The precision of cost estimates for leave days is determined by data available and how the estimates will be used. For example, a quick study may have to assume that employees accrue and use the average of the minimum and maximum possible under agency policy. If entry levels receive 12 days and those with 10 years, 20 days, then 15 days could be used to roughly approximate annual vacation costs. This is the least preferable approach.

Method 2: Average tenure

Slightly more information would enable the analyst to estimate leave costs on the basis of average tenure on the job. Thus, average length of service with the agency is 8.5 years, which carries an entitlement to 14 days annually according to policy, collective bargaining agreement, or tradition.

Method 3: Weighted average

A third method is to review personnel records and extract the leave accrual rate for each employee and use an average for the agency. This requires more time, resources, and patience. While you are in the records, however, the estimates can be readily improved by also recording each individual's daily rate. This extra effort will enable calculation of a weighted average benefit rate, which more accurately reflects the cost of vacation days to the agency for the particular time period.

Once you have become thoroughly infatuated with cost analysis, you may want to achieve the ultimate estimate by adjusting costs downward for leave that is accrued but not used in the year under study. (Handling this situation is discussed in the sick leave section below.)

Comparison of methods

Each of the above methods can be done for individuals, classes of employees (e.g., uniformed, civilian), functions (investigations, patrol, forensics), or any other grouping of personnel necessary for the analysis. To illustrate the uses and show the differences, a comparison of the last two, more preferred methods is shown.

Example of the weighted method. John Wily, the prosecutor, has 10 employees: a deputy, two assistants classified as Grade I, and seven as Grade II. Exhibit 4–3 shows the relevant data for calculating a weighted fringe benefit rate for vacation days only. "Weighted" simply means that the resulting average for the whole office takes into account varying salaries and vacation days for each person, since the cost of a day is greater for higher salaried employees. Of course, this procedure could also be applied to groups such as all attorneys I, II, etc. The reason, in this case, for deriving individual rates is that the analysis done by the NBI Project was designed to estimate the cost of different types of cases (e.g., misdemeanor/felony) and different functions (e.g., intake, pretrial, trial, etc.) that were performed by different people. Once data have been extracted from payroll and personnel records, the estimation procedure is relatively simple.

A daily rate (column b) is derived by dividing annual salary by 261 days. (The work year for the prosecutor's office in this jurisdiction is different from the police, because policy is set by the State.) Column c was collected from personnel records and shows

Exhibit 4–3

Weighted fringe rate for vacation

Wt./average	(a) Annual salary	(b) Daily rate	(c) Accrued vacation days	(d) Cost vacation days (b x c)	(e) Cost work days (a - d)	(f) Rate (d/e)
Chief	$64,170.00	$245.86	21	$5,163.00	$59,007.00	8.75%
Deputy	47,889.00	183.48	20	3,670.00	44,219.00	8.3
Asst. I	32,418.00	124.21	16	1,987.00	30,431.00	6.53
	32,418.00	124.21	16	1,987.00	30,431.00	6.53
Asst. II	30,873.00	118.29	16	1,893.00	28,980.00	6.53
	29,404.00	112.66	16	1,803.00	27,601.00	6.53
	29,404.00	112.66	15	1,690.00	27,714.00	6.10
	26,672.00	102.19	15	1,533.00	25,139.00	6.10
	25,404.00	97.33	12	1,168.00	24,236.00	4.82
	20,902.00	80.08	12	961.00	19,941.00	4.82
	20,902.00	80.08	12	961.00	19,941.00	4.82
Mean	$32,769.00	125.55	15.55	$1,952.00	$30,817.00	6.33
Range midpoint	$42,536.00	$162.97	16.5	$2,689.00	$39,847.00	6.75
Asst. II midpoint	$25,887.00	$99.18	14	$1,389.00	$24,498.00	5.67

that John, for example, earned 21 days vacation (and we assume he never carried leave to the next year) for a cost of $5,163 (column d). The $59,007 cost for the remaining 240 workdays (column e) is divided into the cost of vacation to derive a rate of 8.75 percent in column f.

The vacation formula based on Exhibit 4–3 is:

$$\text{Fringe rate (f)} = \frac{(a/261)\,c}{a - [(a/261)\,c]} = \frac{\text{Vacation cost}}{\text{Base salary}}$$

$$.0875 = \frac{(\$64{,}170/261 \text{ days})\ 21 \text{ days}}{64{,}170 - [(\$64{,}170/261)\ 21 \text{ days}]}$$

The weighted vacation fringe rate can be calculated for each position in the same fashion and results in an average rate of 6.33 percent. Time, data availability, or intended purpose may not require this precise calculation; if not, a simplified method can be used.

Example of mean method. If you only know the range of salaries ($20,902 to $64,170) and vacation (12 to 21 days), compute the midpoint of these ranges by adding the high and low and dividing by 2.

$$\text{Midpoint} = \frac{20{,}902 + \$64{,}170}{2} = \$42{,}536$$

$$\frac{12 + 21}{2} = 16.5 \text{ days}$$

Figure the daily rate by dividing the salary midpoint by 261:

$$\text{Daily rate} = \frac{\$42{,}536}{261} = \$162.97$$

Vacation day costs divided by base salary yields the fringe rate, just like the first example:

$$\text{Fringe rate} = \frac{\$162.97\ (16.5 \text{ days})}{\$42{,}536 - [\$162.97\ (16.5 \text{ days})]} = .0675$$

The fringe rate for John Wily's office is only slightly higher using the simple method, because the range of vacation days earned is very small for most of the employees. Only John and his deputy enjoy about 4 weeks of leave; nine subordinates receive between 12 and 16 days, which pulls the weighted average days downward. The higher midpoint ($42,536) in the second approach produces a higher daily rate, but the vacation days also are multiplied by a higher daily base salary.

The small differences should not lead you to take the easy route immediately. A 1-percent difference in fringe rate for this prosecutor's office would change annual costs by over $3,000. If the purpose, as it was here, is to allocate costs to specific tasks, then the different individual rates will affect the estimates for the task.

Other leave costs

Sick, disability, holiday, and other days away from work can be estimated in a fashion similar to vacation. Paid holidays are set by policy and their cost as a proportion of fringe can be derived easily. The purpose of the analysis and the requirements for precision will determine whether this is done at the individual, employee class, or agency level.

Sick leave

Sick leave days are more difficult to cost because policy and use can vary so widely. Gladys Goodnight creates no problem, because all her days are used in the year they become available. Some jurisdictions may allow unlimited accumulation of sick leave, pay a percentage, or liberally approve use at retirement. Each year, then, they are increasing the amount they will potentially have to pay in some future period (i.e., accruing a liability). Ideally, agencies would set aside money each year to cover this liability and report it as a cost; but this is seldom done in practice.

The simplest sick leave estimation procedure is to assume (a) some proportion of each year's accumulation is used in that year and (b) the balance is never paid. For example, 12 days are granted to each employee; the cost estimates assume 6 are used and 6 are lost. This will not cause much error when the organization is over 20 to 25 employees, because the cost of the days will be spread over a large salary base of $400,000 to $500,000.

The arbitrary assumption of 50 percent usage can be improved upon by a search of personnel records to estimate the mean number of days used annually. Whether this is calculated by individual, class, subunit, etc., it should be consistent with the way other fringe data are grouped; this, in turn, depends on the purpose of the analysis. This approach assumes that sick leave in that year is representative of both normal and retirement use; a comparison of several years will test what is typical.

The most difficult approach to sick leave is to impute a present value of the accrued liability. An "accrued liability" is an obligation to make an expenditure in the future (this year or beyond). "Present value" is the value today of an amount that will be received in the future. Think of it as a savings account; you could invest about 62 cents today at 10 percent compounded annually and receive $1.00 in 5 years. The present value of that dollar, then, is 62 cents. Employees may view sick leave accumulation as a kind of savings account or insurance that they can use to cover future needs. If practice or policy permits deposits to remain in the account, the jurisdiction has allowed a claim to be made against future tax revenues. This year's liabilities (unused sick days) have been transferred into next year's, the year after, the year after that... The amount of expenditure to close out the account is affected by sick days accumulated annually, the time until payment is due, and the daily salary rate at the time of payment. The experience of one of our characters will clarify this present value concept.

An example. Assume Patrol Officer Lionel McGruff begins the year with no sick days (perhaps he had a catastrophic illness last year), is entitled to 12 days annually, and used 6 days for followup visits to his doctor. He has accumulated a net of 6 days this year, which at his salary of $100 daily is worth $600. In 19 years, Lionel will

retire and benefit from his department's generous salary increases of 4 percent a year. Compounded each year at 4 percent, his salary at retirement will be $210.70 per day without any promotions. Those 6 days will cost the agency about $1,264, but the value of these dollars today is less than when John finally gets paid in 19 years. One way to think about this is to ask, "How much would McGruff's agency have to invest today to have $1,264 when it is needed?" Of course that depends on the interest rate it would receive; the lower the rate the more the agency would need to invest today. Present value is just the reverse of this: reduce the $1,264 each year by some percentage until you have covered the number of years between when the payment is due and the present. This reverse process is called "discounting" (as contrasted with compounding on a savings account). Reams have been written on choosing the "appropriate discount percentage," but a good rule of thumb is to use what it would cost the agency to borrow money (e.g., 8 percent). You do not have to actually perform the laborious calculations, since present value tables are readily available in accounting books, libraries, and computer programs. Lionel's retirement bonus of $1,264 at an 8-percent discount rate is worth $293.25 today and this amount should be included as the cost of using his services this year.

Other fringe benefits

Social Security, retirement, life insurance, unemployment, worker's compensation, and similar insurance-like benefits are easily calculated. Again, the purpose of the analysis will dictate the level of precision; but these usually can be treated in a more aggregated way.

The least precise is a "lump sum" approach that simply subtracts the costs of the various leave days discussed above from total fringe benefit payments to derive "other fringe benefits."

$$\text{Other fringe rate} = \frac{\text{Expenditures on other benefits}}{\text{Base salaries}}$$

This is acceptable when agency contributions do not vary substantially by salary level, job classification, tenure, etc. There are occasions, however, when adjustments will be necessary. Calculation of fringe rates that vary by income (e.g., life insurance) will need to be done by salary level if the agency is small, has one or two high-salaried people, only a few lower paid ones, and costs are to be distributed across functions, activities, or tasks.

The most important caution regarding other fringe benefits is the jurisdiction's or agency's policy of self-insuring. This is the practice of accounting for payments such as unemployment compensation at the time they are paid rather than when the

entitlement is earned. Self-insuring that is not funded can create accrued liabilities in the same manner as accumulation of sick leave, as discussed earlier.

Points to remember

Fringe benefits can represent over 80 percent on top of direct salaries and wages. Their distribution between current and future accounting periods can create significant distortions in cost estimates. Some key points to remember when calculating fringe benefit costs are:

1. Expenditures may be hidden in other divisions' or departments' budgets.

2. Base salary is calculated by multiplying a daily salary rate times the days actually on the job. Transfer the cost of training days to indirect costs.

3. A fringe benefit rate is calculated by dividing the cost of the benefit item by the base salary.

4. Fringe must be estimated by individual or group within the organization if (a) personnel are involved to different degrees in different activities, and (b) you plan to allocate labor costs to these activities.

5. Entitlement to benefits may vary by tenure, organization level, salary, job classification, occupation, or funding source for benefits.

Benefits can represent a substantial mortgage on future taxes if accrued liabilities are not accounted for and funded. By understating real costs, government budget and expenditure reports can appear parsimonious today, when in fact decisionmakers have implicitly mortgaged the future. Second, the concept at least should become an explicit topic in the policymaking and collective bargaining arenas. Few jurisdictions will choose to calculate the present value of accrued liabilities, even though computer technology makes it possible to monitor these hidden costs on a regular basis. Open debate may make the tradeoffs between present salaries and future benefits somewhat more rational.

Chapter 5:
Act 4. Capital


The City Tribune
Local News
Rapist Escapes Old Courthouse
New Jail To Be $60 Million

When most people read these headlines, they might first assert the need for a new jail and then be astonished at its cost. Why is a jail the public was told would cost $20 million suddenly going to cost $60 million? But the ambitious young reporter who wrote the story on jail costs holds a degree from a prestigious business school and knows that the items included in the $20 million bond proposal are more than just the labor and materials required to construct a foundation, four walls, and a roof. Land, architectural fees, bidding expenses, site preparation, and even sometimes equipment are part of the cost (Wayson et al., 1981:89). Rarely are these even a complete accounting, because money is borrowed to finance construction. A $20 million facility, whose construction is financed with 10 percent bonds to be paid at the end of 30 years, will actually cost several times this amount. The cost has simply been transferred into deferred claims against future tax revenues. Construction and finance expenses do not exhaust the costs of capital. In this section we first present some terms and definitions to help in understanding capital concepts. Next, we involve some of our friends from Yourtown in some applications. This chapter is lengthy because of the many concepts requiring development and the lack of a treatment of capital for criminal justice analysts in other documents.

The cost of capital

Most people do not make a distinction between the use of $20 million for the courthouse and the $20 million spent on salaries, supplies, utilities, and other resources, that once expended, are no longer available. Capital, on the other hand, is a resource whose useful life extends over more than one accounting period. Since it remains available for use over several time periods, the building becomes a consumer of other resources to retain its usefulness. We have all visited the office with peeling paint, water-stained walls, cracked windows, and leaky faucets. Beside aesthetics, these are symptoms of decaying capital. Maintenance, repairs, utilities, and similar items just to keep the doors open are recurring costs of capital over its lifetime.

Accounting practices

The above technical and operational complications are further confounded by the way in which governments account for their financial activities. Business or enterprise accounting is based on a deceptively simple tautology:

$$\text{Assets} = \text{Liabilities} + \text{Equity}$$

This equation must always balance; a change in any single item must be accompanied by corresponding adjustments in one or more of the others. In this section of the manual we are limiting the discussion to only some of the asset items such as land, equipment, inventory, and buildings.

Governments, however, were not created to use assets to produce revenue. Funds control is, and remains, the dominant concern of public-sector accounting. The overriding question these systems must answer is: were appropriated funds expended for the intended purposes? Approval to travel, hotel receipts, and an itinerary are all simply tools (sometimes too diligently applied) for realizing this important principle of control, which we derisively call "red tape." A limited vision, therefore, only sees materials, labor, professional fees, and maybe land as the cost of the courthouse.

Constructing the courthouse can be described from an accounting perspective as the exchange of one type of asset (money) for another (building). Time complicates this simple transaction as you try to separate the expenditures for the building from the costs of its use. Including all of the expenditures now will overstate service costs this year and understate them in subsequent years. Ignoring them entirely will forever distort service costs, as we so well know with prison incarceration, where capital and finance charges typically are not included in annual outlays and the new prison appears far less costly than, in fact, it is. The proper treatment is to only charge a particular cost objective (e.g., judicial services) for some proportion of the transaction each year, even though the cash that changes hands in a fully paid for construction project may total $20 million this year. (Selecting the "correct" proportion must remain in the arcane realm of depreciation theory.) This spreading out of costs seems commonsensical, but it is also as common to confuse cash expenditure and costs.

The preponderance of public and official attention during the annual budgeting ritual is directed toward the necessary task of balancing cash revenues with cash expenditures. Some elected representatives, some in the administration, and a few informed citizens will understand that the $100 million budget, which we erroneously assume will be spent entirely this year, includes a one-time, $20 million outlay for the courthouse that should be expended over its useful life as a cost of judicial services. Most, however, will be unaware of the longer run effects of changing asset forms and of designating judicial services as the beneficiary of this transfer.

Interest

Removing the stricture of spending only what could be collected annually from a patriotic citizenry moved the time-value of money (interest) into the peripheral vision of control accounting. Jurisdictions were no longer limited in the current year to tax revenues but could call on intermediaries (money markets) to collect revenues from

anyone for a price. The only financial constraints in the extreme were investors' faith in the government's ability to repay principal and interest out of future tax revenues. (As some State and city crises in recent years have humbly reminded us, this faith was not eternal!) Still, this new complication was considered an oddity to be relegated to some specialized accounts managed by experts and not a cost to be added to annual operating expenses of the beneficiary unit of government. While there have been some attempts in recent years to more accurately assign, say, debt-financed capital charges to at least the agency level, the treatment of capital in the accounts generally remains a muddle. But the magnitude of capital costs dictates that we treat the subject in considerable depth.

Life cycle cost

The total cost of capital throughout its useful life is referred to as life cycle cost. This cost incorporates the additional resources necessary to actually operate and maintain capital stock. That is, another consequence of the courthouse's enduring character is that space must be heated; an attendant hired for the parking garage; spacious halls cleaned; and light bulbs replaced. Maintenance, repairs, and operating expenses will add to the life cycle cost of the capital. While life cycle cost is a way of evaluating proposed capital expenditures (not accounting for them), the technique is essential to accurately describing the tyranny of time associated with capital. Durability, government accounting practices, debt financing, all conspire to sink the analyst in a mire of imponderables and fugitive data. The sections that follow on determining capital charges for criminal justice processing costs will provide some guidance; but more frequently than not, the practice will be situational judgments based on data availability.

Other useful concepts

The above discussion of capital is a subcategory of what is called "assets" in a business. Other such assets include cash, accounts receivable, notes receivable, etc. While our concern here is with physical capital, there are other distinctions: intangible capital might include such items as mineral rights or other nonphysical resources held for the future benefit of the organization; human capital is the pool of knowledge, skills, and capabilities embodied in the personnel. Physical capital is distinguished still further by accountants into land, buildings, and equipment, because they typically have quite different useful lives. Land, for example, is not considered a depreciable asset, even though its usefulness may be depleted with inappropriate use (e.g., erosion). Buildings are considered to have an economic life extending 20, 25, or 30 years; whereas, equipment usefulness can vary from 3 to 10 years, depending on the rate of obsolescence and/or durability. Some computer equipment, in fact, may have a useful life of less than 3 years.

Depreciation

Since capital, by definition, is used up over time, there must be a systematic process for allocating these items to expenses (costs). This process is called "depreciation." If you are familiar with different schemes approved by the Internal Revenue Service, forget them! These have little relationship to the accounting treatment of depreciation but, rather, are devised to meet certain economic policy objectives without regard to useful life. An introductory accounting text is a better source on the various approaches to depreciation, and "straight-line" or an equal allocation each year is more than adequate for estimating criminal justice processing costs. Strictly speaking, a fully depreciated item still in use is not a cost to the organization; it has been completely charged to the appropriate year. However, the scrap or salvage value is an "opportunity" cost of continuing to use the capital rather than divest.

Interest is another capital-related charge that must be kept distinct from depreciation. If a building has been constructed with bond moneys raised specifically for that purpose, this is reasonably straightforward; and an annual estimate usually can be obtained from the jurisdiction's finance officer. Slightly more effort will be required if the bond issue included several facilities. Precise guidelines cannot be given for deriving an estimate of interest because of such items as variations in law, bond packaging, and repayment schedules. The analytical task is not so much calculating an amount (this is usually done by the finance office) as it is locating the knowledgeable person and assuring that interest charges are not left out of processing cost estimates.

Sunk costs

A final word on language has to do with the concept of "sunk" or "historical" costs, the costs previously incurred on a capital item; these costs include already depreciated capital and previous repair or capital-added costs. Some argue (Horngren, 1977: 337; Fisher, 1971: 33) that while it may be unfortunate that a capital item was acquired in the past, its cost is irrelevant to decisionmaking that implicitly is concerned only with the future. This is true, given that these authors are writing in the context of using cost and economic analysis to provide information for decisions. However, if the purpose of the analysis is to document or describe the cost of carrying out an activity then these historical costs are relevant, because they are necessary for the activity. The analytical treatment depends on the purpose of the study. Another argument for including historical or sunk costs when examining government operations is that the cost of capital has traditionally been relegated to central accounts managed by specialists outside operating agencies. Thus, the cost of government is continually *understated* by ignoring the capital stock necessary to perform its functions.

Estimating capital stock

There are two steps that must be completed to estimate the capital portion of criminal justice processing costs. The first is to determine the amount of capital; the second, to apportion this amount by year, then by agency, and finally by cost objective. The first step is by far the most difficult.

Step 1: Remove capital expenditures from reports

Regardless of how capital is finally treated in a study, the first task is to remove expenditures on these items from the annual reports. Two questions typically arise during this task:

1. Should all items, however small, be removed?

2. What is the dollar cutoff for classifying an expenditure as capital or operating cost?

We will now analyze Yourtown's expenditures report as illustrated in Exhibit 5–1 on the following page. As stressed earlier in Chapter 3's examination of the chart of accounts, we will help you identify and categorize many of the expenditures appearing in seemingly straightforward line items. Our purpose here is to purge the expenditure report of capital items to have a first approximation of direct operating costs by excluding depreciable items and improvements, and including repairs, maintenance, and low-cost capital items.

Minor equipment. You may find in the report that staplers, paper punches, pens, and 50 lamps for a renovated warehouse/office building were included in "office supplies." Technically they are capital whose useful life extends beyond the year of purchase; prudence, however, dictates that the analyst avoid becoming hopelessly mired in paper quicksand and simply incorporate these types of low-cost items as an operating expense in the year they were purchased. The guide to follow is whether including them will *materially* affect the estimates and present a distorted picture of this year's operating costs.

Any cash outlay can be either expended or capitalized. "Expended" means the transaction is classified into operating costs for this year; "capitalized," means the cost is spread out over several years. You may follow whatever rule is used by the accounting system of the jurisdiction in expanding or capitalizing an item, if you remember that capital purchase must be acknowledged separately from day-to-day operating costs. This rule may require that a capital item costing over $100, $500,

Exhibit 5–1
Report of expenditures

Yourtown
July 1, 198_ to June 30, 198_

Item of expenditure		Amount
	Personnel	
	Salaries	$4,320,501
	Benefits	1,080,125
	Operating	
	Office supplies	236,457
	Equipment	76,040
	Cleaning service	53,666
	Travel	124,898
	City garage	92,000
	Utilities	206,006
	Repairs and maintenance	572,840
	Professional services	1,250,500
	Office rental	71,020
Subtotal	**Personnel and operating expenses**	**$8,084,053**
	Capital improvements	
	Courthouse, phase I	2,036,400
	School fund	12,673,000
	Public works	430,666
Subtotal	**Capital accounts**	**$15,140,066**
Total	**Personnel, operating, and capital expenses**	**$23,224,119**

$1,000, or some other amount at least be inventoried (if not depreciated), even though its total cost is reported in the year purchased. Automobiles, computers, desks, chairs, and reproduction machines are examples of capital for which this is sometimes done. This is a situation where the government's control concerns can provide useful information for imputing capital charges.

Our tireless digging has uncovered that "equipment" is only for items over $500; however, "city garage" includes gas, oil, parts, a disassembled fire truck, and two police cars at $18,000 each. The truck (to be assembled by firemen in their spare

time) and cars must be removed from this category and placed in "capital improvements." (The cost of labor to construct the fire truck must be added to its cost and depreciation begun in the year it is first used.)

Repairs. There is a particularly perplexing issue around expenditures on buildings that already exist. Your perusal of the expenditure report has found that "repairs and maintenance" includes $120,000 for renovating a warehouse. Remove it! Should the line item "replace courthouse roof" for $29,000 be capitalized or expended? The answer depends on whether or not the roof represented an addition to capital stock or just a repair; the leaks are eliminated in both cases. If asphalt was replaced with slate at twice the price in order to maintain the quaint historical character of the town, the difference should be treated as an *improvement*, added to the depreciated value of the building, and allocated over several years; the balance as a repair expense. There are no universal rules for making these judgments other than asking if the expenditure was above and beyond what was necessary for normal wear and tear (i.e., maintenance/repairs). Again, *materiality* is the overriding principle.

Architectural fees. You know Rachet, Rachet and Cog, Architects, designed the new courthouse and find that their 6-percent fee of $1.2 million was paid this year and classified as "professional services." This should be removed and added to the final cost of the building to be depreciated.

Capital improvements. "Capital improvements" may or may not include additions to capital stock that are depreciable. Phase I of the courthouse construction and $29,000 for the press box at the high school football field (school fund) are clearly not operating expenses and should be deducted. Sealing the basement walls at the intermediate school to eliminate seepage should be expended as *repairs* but is improperly classified under "capital improvements."

Costs of holding capital. Some other items clearly are a cost of capital but should remain in the expense report as the cost of maintaining physical stock in operating condition. For example, "office rental" includes a depreciation item along with return on the owner's investment and interest; similarly for most of "repairs and maintenance" and all of "cleaning service." The adjusted expenditure report might look like Exhibit 5–2.

The items in parentheses on the revised expenditure report were deducted from their original categories and added back into the appropriate one. They total almost $1.5 million and represent, with the exception of basement sealing, additions to Yourtown's capital stock. Of course, additional work would be necessary before you could begin applying depreciation: the new courthouse and fire truck will not be depreciated until

Exhibit 5–2

Report of expenditures

Yourtown
July 1, 198_ to June 30, 198_

Item of expenditure		Amount
	Personnel	
	Salaries	$4,320,501
	Benefits	1,080,125
	Operating	
	Office supplies	236,457
	Equipment	(76,040)
	Cleaning service	53,666
	Travel	124,898
	City garage	92,000
	Fire truck parts	(30,500)
	Two police cars	(36,000)
	Utilities	206,006
	Repairs and maintenance	572,840
	Warehouse renovation	(120,000)
	Courthouse roof ($29,000 - $15,000)	(14,000)
	Seal basement walls	11,050
	Professional services	1,250,500
	Architectural fees	(1,200,000)
	Office rental	71,020
Subtotal	**Personnel and operating expenses**	**$6,618,563**
	Capital improvements	
	Courthouse, phase I	2,036,400
	Architectural fees	1,200,000
	School fund	12,673,000
	Seal basement walls	(11,050)
	Public works	430,666
	Equipment	76,040
	Fire truck parts	30,500
	Police cars	36,000
	Warehouse renovation	120,000
	Courthouse roof ($29,000 - $15,000)	14,000
Subtotal	**Capital accounts**	**$16,605,556**
Total	**Personnel, operating, and capital expenditures**	**$23,224,119**

they are placed in service; there are probably additional costs to the warehouse renovation; items under "equipment" maybe depreciated at different rates.

Step 2: Estimate capital value for study year

The next task is to develop an estimate for capital that existed prior to this year and was partially used in the criminal justice process. There are several options available for valuing capital, depending on the time and data available to complete the study. The least acceptable option is to remove capital items, as in Step 1, and simply discuss where and how capital is used in the criminal justice process. Second best is to estimate facility costs by deducting all capital-related expenses (i.e., repairs, maintenance, housekeeping) and substituting a "rental equivalent"; equipment costs can be assumed to be some relatively constant historical average. Ideally, capital costs are estimated by creating depreciation schedules for significant items; but time and data frequently make this impractical. We take the time here to present these methods, especially this third, in some detail—with examples—to allow the analyst to choose with confidence the best techniques for the work at hand. There is not a quick way out of the capital estimation process.

Method 1: Describe capital expenses. The simplest and least acceptable method of capital cost estimation would include the following:

Physical description of buildings	**Equipment descriptions**
Location	Types of items
Size	Number of items
Age	Age
Value	Value

You might include some data on the original cost of some items to provide readers a sense of relative magnitudes, as in this example:

> The police department uses 22 patrol cars, ranging in age from 1 to 8 years with the majority being about 4 years old. The rule of thumb followed by the department is to replace vehicles at 100,000 miles or 5 years, which ever occurs first. This rule is contingent on funds availability and priorities in any particular budget year. The procurement office estimates that a fully equipped patrol car costs about $22,000 in today's dollars and that the vehicles currently in use cost a total of about $500,000.

Something like this description for buildings and land as well will provide some context and prevent the typically substantial capital stock from being ignored entirely. For a recently constructed building, you can even include a description of imputed

depreciation. However, your analysis must *treat capital consistently across organizations* when costs are distributed down to loaded resource units. You cannot include a capital charge for the courthouse and ignore the police station, because it will distort comparisons between, for example, hourly costs of judges and police.

The above treatment of capital does not produce an annual capital charge but simply better informs the reader. Two approaches can be used cautiously to give a rough approximation of capital usage as a substitute for building and equipment depreciation. An examination of several years' expenditure reports may reveal that, with one or two exceptional years, the organization's equipment budget is reasonably constant, perhaps with minor increases for inflation. Buttressed with interviews of budget, finance, and/or procurement people, a mean of these figures may be used as a proxy or substitute for equipment depreciation. Of course, you should exclude extraordinary items such as 20 computer terminals, 50 desks for the renovated warehouse, etc. The assumption is that an informal rule of thumb is operating that attempts to replace items in a planned way. The operative principle here is to operate "cautiously."

Method 2: Rental equivalents. The second approximation of capital usage for buildings is "rental equivalent." Information on rent prices for comparable space can be collected from the Board of Realtors, real estate agents, owners, or expenditures for other space rented by the government. Here the operative principle is "comparable." Granted there is nothing quite like an ornate courthouse or precinct station, but there are structures being used in a comparable way. Be aware that a rental price will include, in addition to just depreciation, return on owner's investment, maintenance and repairs, and maybe interest. These inherent inaccuracies, however, are less distorting than not including any cost of capital in the estimates. If it makes you uneasy, exclude from the official expenditure report these types of items related to the building and substitute a rental equivalent.

A look at Yourtown's revised expenditure report in Exhibit 5–3 will illustrate how this refinement might be made. Recall that we moved the "equipment" category entirely from "operating expenses" and placed it under "capital improvements." The chic warehouse renovation and $14,000 for the courthouse roof were netted out of "repairs and maintenance"; sealing the intermediate school's basement walls was added in. These changes result in a new total of $449,890 for "repairs and maintenance."

These new totals must be further adjusted to remove items in "operating expenses" that are related to the cost of owning capital, because they will be implicitly accounted for in the rent estimates. "Cleaning service" and "repairs and maintenance" will be affected (renter will pay the heat and electric portion of "utilities"). Exhibit 5–4 represents our total after deducting these items.

"Cleaning service" is reduced by the amounts expended on contracts for the schools and the Knapp Building, which houses all other offices except the courthouse. Jail

Exhibit 5–3

Report of expenditures

Yourtown
July 1, 198_ to June 30, 198_

Item of expenditure		Amount
	Personnel	
	Salaries	$4,320,501
	Benefits	1,080,125
	Operating	
	Office supplies	236,457
	Cleaning service	53,666
	Travel	124,898
	City garage	25,500
	Utilities	206,006
	Repairs and maintenance	449,890
	Professional services	50,500
	Office rental	71,020
Subtotal	**Personnel and operating expenses**	**$6,618,563**
	Capital improvements	
	Courthouse, phase I	2,036,400
	Architectural fees	1,200,000
	School fund	12,661,950
	Public works	430,666
	Equipment	76,040
	Fire truck parts	30,500
	Police cars	36,000
	Warehouse renovation	120,000
	Courthouse roof ($29,000 – $15,000)	14,000
Subtotal	**Capital accounts**	**$16,605,556**
Total	**Personnel, operating, and capital expenditures**	**$23,224,119**

trustees clean the courthouse; the judge funds their mops, pails, cleaners, and squeegees in "office supplies." Since we are only considering buildings, equipment repair is retained, but school, courthouse, and Knapp Building are deducted. The latter facility was built 60 years ago under the administration of "Boss" Knapp, and you suspect there are some improvements buried in the $56,480 but decide they do not meet the principle of materiality. Now you must collect information on rental prices of buildings comparable to the school, courthouse, and Knapp.

Exhibit 5–4
Report of expenditures

Yourtown
July 1, 198_ to June 30, 198_

Item of expenditure		Amount
	Personnel	
	Salaries	$4,320,501
	Benefits	1,080,125
	Operating	
	Office supplies	236,457
	Cleaning service	53,666
	School contract	(37,000)
	Knapp Building contract	(16,666)
	Travel	124,898
	City garage	25,500
	Utilities	206,006
	Repairs and maintenance	
	Equipment repair	125,136
	School building repair	(253,274)
	Courthouse repair	(15,000)
	Knapp Building repair	(56,480)
	Professional services	50,500
	Office rental	71,020
Total	**Personnel and operating expenses**	**$6,240,143**

The most obvious problem is deciding on "comparability." We already have decided that rental prices will include cleaning, repairs, and maintenance and exclude heat and electricity. What kind of space should you look at? Your sources can be of invaluable help in identifying comparable space and even making reasoned, professional adjustments of market prices to account for differences between actual facilities and your hypothetical ones. For example, there may be nothing quite like a school building; yet it is somewhat like an office building without such facilities as the gymnasium, cafeteria, press box, or library, so the $14.25 per square foot price can be increased by about $2.00. The courthouse is composed primarily of offices and large, open spaces for people to congregate (forget the leaky lockup!); therefore, rental prices for offices can be applied to a portion of the building and those for cocktail lounges to the remainder. These are cited for illustrative purposes only; the point is that a host of "comparables" can be identified that when supplemented by your new-found friends' reasoned professional judgment, can produce adequate estimates of capital charges for buildings.

We now have an estimated annual operating cost (not "expense"!) for Yourtown in Exhibit 5–5.

The estimates have been reorganized to avoid confusion with the official report and to better distinguish types of capital charges. Also, note that the exhibit title and total line are labeled "costs," not "expenditures." The imputed capital cost of equipment ($76,040 less $42,000) was accepted only after it was found that the mean expenditure for this category over the last 5 years was $34,100; use either the average or, as we did here, the actual expense minus the extraordinary expense of furnishing the renovated warehouse. Rental equivalents probably have not accounted for the resplendent appointments in the courtroom and chambers; the mayor's price less surroundings; nor the press box at the high school. So, you can argue over what is an appropriate amount but not about whether there is a cost of using these capital items. Yourtown's council does not look like such profligate spenders!

Method 3: Depreciation schedules. The "best" method has been left until last, because it will probably be used the least! Locating construction costs, adding capital improvements over the life of each facility, and inventorying equipment will be beyond the constraints of most studies. It is important, however, to understand the application as a context for using less thorough methods of capital cost estimation. "Depreciation" is the systematic process of allocating the cost of an asset over its useful life to account for either physical deterioration and/or obsolescence. The latter occurs (even though physical condition is excellent), because technology changes or the item becomes inadequate for present needs. You may not have multicolor xerography or a machine that gets those new presentence reports out on time! Since assets are assumed to have different useful lives, they can be grouped on the basis of these periods. Vehicles, for example, may be depreciated over 5 years; metal desks, 10 years; buildings, 30 years. This accounting concept does not mean that the item ceases to exist or is obsolete after 5, 10, or 30 years; only that this is a reasonable period to consider it useful. Any accounting textbook can provide a detailed explanation of depreciation methods; a summary of straight-line, unit-of-output, and sum-of the-years'-digits approaches will suffice for our purposes.

A lighthearted but analytically correct example—Three years ago the chief judge of Yourtown was presented an automobile appropriate for her position; the cost, $26,384. Capital such as this with chrome finish, power assist, leather upholstery, communications, and a refreshment center is expected by Yourtown's comptroller to last 8 years and be sold by sealed bid to city employees for between $5,000 and $6,000. The depreciable cost, therefore, is:

$$\$26{,}384 \text{ (original cost)} - \$5{,}500 \text{ (residual value)} = \$20{,}884$$

Exhibit 5–5
Report of estimated costs

Yourtown
July 1, 198_ to June 30, 198_

	Item of expenditure	Amount
	Personnel	
	Salaries	$4,320,501
	Benefits	1,080,125
	Noncapital costs	
	Office supplies	236,457
	Travel	124,898
	City garage	25,500
	Professional services	50,500
	Capital costs	
	Utilities	206,006
	Equipment:	
	Repairs and maintenance	125,136
	New equipment	76,040
	Less:	
	Warehouse furnishings	(42,000)
	Firetruck parts	30,500
	Police cars	36,000
	Facilities:	
	Office rental (private)	71,020
	200,000 sq. ft. school space @$16.25 =	3,250,000
	2,500 sq. ft. courtroom @$11.75 =	29,375
	7,500 sq. ft. court offices @$14.25 =	106,875
	6,400 sq. ft. Knapp offices @$14.25 =	91,200
Total	**Personnel, noncapital, capital costs**	$9,830,133

The *straight-line method* would assume that the usefulness of the car was evenly distributed over the 8 years. Annual charges would be:

$$\frac{\$20,884}{8} = \$2,610$$

However, being proud of the new acquisition, the judge uses her mobile office extensively for several years but loses interest and begins taking the subway. *Sum-of-*

the-years'-digits (SYD) is one of the methods that takes into account that an asset's usefulness may be greater in its younger years. SYD is computed as follows:

$$\frac{\text{Remaining years of useful life}}{\text{Sum of years of useful life}} = \frac{6}{8+7+6+5+4+3+2+1} = \frac{6}{36}$$

Then, this fraction or 16.667 percent would be applied in year 3 to the depreciable value of $20,884; other years of its life would use the same denominator (36) but a different numerator.

Automobiles represent a type of capital where you can use unit-of-output depreciation, because the mileage (output) over their useful life can be reasonably estimated. The judge's car is expected to be used for commuting, benefit galas, campaign fundraisers, and other transportation essential to the criminal justice process. *Unit-of-output* capital costs would be estimated by:

$$\frac{\text{Cost - residual value}}{\text{8 years x 6,000 miles}} = \frac{\$20,884}{48,000 \text{ miles}} = 43.5 \text{ cents per mile}$$

Actual annual mileage would be multiplied by 43.5 cents to compute a depreciation charge for the judge's transportation.

An influx of workers with high transportation needs at the new embassy presents the resourceful comptroller with an opportunity to cut his losses and divest the city of the judge's car, an under-utilized asset. Like most windfalls, however, Yourtown will have to spend money to make money, because this new customer insists on V-12 motors; microwave communications, rather than CB radio; armor plating; bulletproof windows; and walnut inlay trim. Jerry's Customizing Emporium provides an estimate of $18,000 to retrofit the modest sedan, is awarded the contract, and makes the repairs. But diplomatic relations being what they are, embassy employees are declared *persona non grata* (by some other unit of government, of course), and Yourtown is stuck. Now, what do you do with these extraordinary repairs?

Extraordinary repairs are anything that will extend the useful life of facilities or equipment. Of course, the comptroller did slightly more than add life support systems to the car, but for simplicity we will give the benefit of the doubt and account for $18,000 and the remaining depreciable cost on a straight-line basis.

Depreciable cost	$20,884
Depreciation (SYD):	
Year 1	-4,641
Year 2	-4,060
Year 3	-3,481
Depreciated value	8,702
Retrofitting	18,000
Revised basis	$26,702

The depreciated value plus retrofitting expenses result in a revised basis for depreciable cost of $26,702, which the embarrassed comptroller decides should be allocated over an additional 5 years. Annual, straightline capital charges for the SecurMobile are $2,670 and are allocated equally to the sheriff and police chief, who use the auto for a crowd control command center in the new city-county building. A similar logic of extraordinary repairs was applied to the slate courthouse roof in the quaint historical district.

Depreciation of capital stock

Exhibit 5–6 is a sample worksheet showing how a depreciation schedule can be constructed for some of Yourtown's capital. The first column identifies the item, followed by the depreciable value. The calculations are shown for illustrative purposes only and usually would not be included. The acquisition date is the year capital was placed in service; assume it was January 1 or prorate for the proportion of the first year it was used. We will only discuss highlights of this example.

Some accounting niceties

Note how useful life was handled for additions to capital stock. The net addition to the courthouse was booked at 7 years, but the retrofitting at 10. The assumption is that the roof has little usefulness independent of the original structure, which has 7 years remaining. That is, slate did not add to the life of the entire building. The V-12 engine and perhaps some of the other retrofitting, in the comptroller's opinion, did add 5 years to the SecurMobile.

Depreciation methods can vary for different types of capital (refer to the car) but should not vary within type, unless a reasonable justification can be made that the item will deteriorate or become obsolete at a slower or faster rate than other items in that class. This might be the case with office equipment that includes computer terminals and attractive, gray metal desks. The method should not have been changed from sum-of-the-years'- digits to straight-line for the SecurMobile. In fact, an unruly populous may cause it to deteriorate faster in its new use as a crowd control command center.

Exhibit 5–6

Depreciation schedule worksheet

Agency: Yourtown
Year: 1986

Prepared by: Greg Falcon

Item	Depreciable	Additions to capital: Acquisition date	Item	Depreciable cost	Date	Life	Method	1985 depreciated value	1986 cost
Buildings									
1. Courthouse	$2,300,000	1960							
	($52,000)					30	SL	$374,675	$74,933
	$2,248,000		Annex	$700,000	1962	30	SL	$154,000	$22,000
				($40,000)					
				$660,000					
2. Knapp	$5,200,000	1932	Roof (net)	$14,000	1985	7	SL	$14,000	$2,000
	($25,000)					30	SL		-0-
Equipment									
1. Metal desks (125)	Full cost	Various				10	SL	$10,000[a]	$1,000
2. Car	$26,384	1983				8	SYD	$8,702	
	($5,500)								
			Retrofit	$18,000	1985	10	SL[b] (total car)	$18,000	$2,670

[a] Estimated value of 125 desks at $80.00: John Scrooge, property management office.
[b] Comptroller should not have changed depreciation method, but he was in an embarrassing situation.

Note: In typical practice, analysts will encounter information from varying sources; a perfect match is rarely possible, but time periods and values should be comparable.

One hundred and twenty-five gray metal desks were added as a group to the worksheet, rather than being listed individually. This was possible because of several factors discovered during the course of collecting other information for the depreciation estimates. These include:

1. Property management knew the number of desks.

2. The unwavering policy is to replace 10 percent of these desks; so the mean age is 5 years.

3. Desks are given to nonprofit, social service organizations at the end of 10 years.

4. If John Scrooge, property management specialist, sold all the desks, he estimates they would bring an average of $80 each.

These are a set of relatively stringent conditions, which you could relax somewhat without doing damage to the result. Each condition, however, is verifiable: count the desks; examine procurement records for several years; ask the nonprofits; attend a flea market. Also, the depreciation charge of $1,000 is small relative to others, so there can be a wide margin of error without significantly affecting the total.

One final subtlety. "Boss" Knapp's monument is fully depreciated, and no one even cared enough over the last half century to improve it. This is a situation where accounting and economic concepts are at odds. The value in our hypothetical accounts is carried at the residual or salvage value estimated in 1932. You cannot, under generally accepted accounting principles in the United States, inflate this meager $25,000 to 1985's $500,000. Yet, the building does have economic value, because the capital still is reasonably serviceable and, as we saw, has a rental equivalent value in today's market of $91,200 annually. Moreover, the economic value of the asset is substantially greater than its accounting book value, even without a devalued dollar. The world is not always as simple as it seems!

Unit-of-output, sum-of-the-years'-digits, and straightline methods are presented to expand understanding of assumptions underlying the systematic allocation of capital costs over several time periods. They make different assumptions about the best measure of capital usage (time or outputs) and about the distribution of utility over an asset's life. It is not expected that criminal justice processing estimates typically will reconstruct depreciation schedules except where the total capital stock is relatively small. It is essential, however, that some adjustment be made in reported expenditures to avoid under- or overestimating.

Summary

Equipment and facilities are types of physical assets held for the future benefit of an organization. Government accounting practices, which typically treat expenditures on these items as costs in the year purchased, can significantly distort estimates of annual criminal justice processing costs. The absence of a systematic allocation of capital costs over items' useful life (depreciation) usually requires adjustments to reported expenditures.

The best method of compensating for distortions is to prepare depreciation schedules for at least the physical assets, which will materially affect annual costs. Materiality is relative to the cost objective(s) being studied. For example, police cars may not be a significant proportion of equipment values for an entire jurisdiction or even the police department, but probably will be material if the cost objective is desegregated to the level of "patrol officer arrests."

A second-best approach is: (a) to substitute an estimated annual facility cost for certain building-related expenses; and (b) to use some approximation of typical annual equipment purchases. How refined these estimates are is a function of not only materiality but also of finding comparable space and related services. Office rents may be applied to the entire courthouse, even though the space is multipurpose. Reasoned, professional judgments of realtors, owners, and others are invaluable to deriving acceptable equivalents.

The minimal and least preferred approach is to exclude significant acquisitions from expenditures and discuss characteristics, numbers, and costs of both new and existing capital. While ignoring what may be substantial costs of criminal justice processing, this method at least removes some of the distortion in unit costs; at the same time it clearly alerts readers to the potential significance and unique character of capital expenditures.

Capital's durability, accounting practices, and common language all conspire to produce an especially difficult, but essential, cost-estimating task. Guided by the principle of materiality, professional judgment, and clear exposition, estimates of criminal justice processing costs can be substantially improved.

Points to remember

1. Capital must be addressed in some way to reduce inaccuracies.

2. Capital is a resource whose useful life extends over more than 1 fiscal year.

3. Government accounting typically treats expenditures on buildings, equipment, and other capital as a cost in the year purchased, which can distort criminal justice processing cost.

4. Depreciation is the process of allocating the cost of a capital item over its useful life.

5. Methods of financing capital acquisitions can significantly affect their lifetime costs.

6. Move capital-related expenditures from an "operations" to a "capital" category.

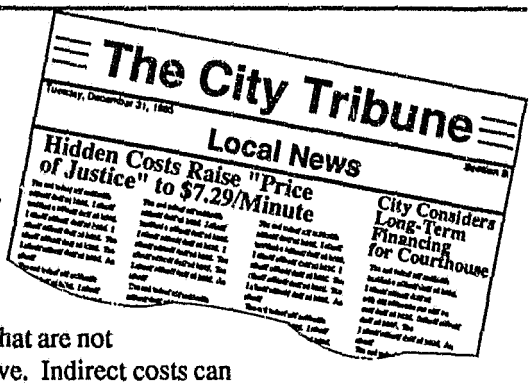
7. The effort of clarifying capital and operating expenses should not be disproportionate of the results achieved (principle of materiality).

8. Determine if "repairs" are for maintenance, additions to capital stock, or a combination.

9. Extraordinary repairs add to the useful life of an asset.

Chapter 6:

Act 5. Indirect costs


The City Tribune

Local News

Hidden Costs Raise "Price of Justice" to $7.29/Minute

City Considers Long-Term Financing for Courthouse

In addition to all the direct costs—salaries, fringe benefits, supplies, equipment, and capital—of justice activities, we also have indirect costs that are not as easily assignable to our cost objective. Indirect costs can raise criminal justice costs substantially, however, as this first headline illustrating data from the NBI Project indicates.

This section will not provide an "indirect rate" or a definitive list of the components of indirect. What it will do, however, is illustrate the types of charges that normally could be characterized as indirect and provide some examples of some agencies' operating experiences. The reader is referred back to Chapter 2 in which indirect costs were one part of our loaded resource unit. Indirect costs are part of the overall management structure that allows Gladys, Lionel, John, "Bud," and all the other criminal justice system actors to do their jobs. Because indirect costs in the public sector may equal or exceed direct costs, their significance should not be overlooked in conducting cost analysis.

Some costs are simply not assignable to a specific cost objective. It is easy to assign the stove to the cook but difficult to determine who is using how much electricity, or base telephone costs, or the mayor's time. Such costs are incurred to benefit multiple users or for multiple cost objectives and are not readily assignable to specific users. Or, as stated in the standard Federal Government definition, indirect costs include those "incurred for a common or joint purpose benefiting more than one cost objective."[1] Examples include administrative time, typing pool, base telephone costs, and the hot water heater in a multipurpose building.

1. General Services Administration, Office of Federal Management Policy, "Federal Management Circular 74-4, Attachment A," (Washington, D.C.: Government Printing Office, July 18, 1974).

Composition of indirect costs

Indirect costs are those costs necessary to an agency's functioning but benefiting more than one cost objective, or not readily assignable to the cost objectives specifically benefited without effort disproportionate to the results achieved. These costs are often referred to as administrative costs, overhead, or support charges.

Other costs might be assignable to a specific cost objective or particular activity, but the time and effort required to appropriately distribute them is out of proportion to the magnitude of their importance. These are expenditures that under the normal definition would be treated as direct costs but are more practically treated as indirect costs. Costs that directly assigned might affect the cost objective in question by a few pennies or a small percentage of the total, but will require considerable analytical time to determine fall into this category. As the General Services Administration goes on to state, assign to the indirect pool those costs "not readily assignable to the cost objectives specifically benefited, without effort disproportionate to the results achieved."[2]

It is emphasized that the identification of the direct and indirect costs of particular criminal justice activities is a means of deriving an accurate estimate of the total costs of those activities. The existence of a pool of indirect costs does not relieve the analyst of determining the best possible allocation scheme.

Indirect costs are as real to the attainment of the cost objective as are direct resource outlays. Ignoring them will understate the total costs of an activity and could result in the inappropriate resource allocation that can accompany underestimation. Further, the sum of the total costs estimated for all criminal justice activities will be less than the actual public outlays. In some cases, indirect costs will amount to more than direct costs, so omission or miscalculation could substantially distort resource use. Managers should be aware of indirect costs because they represent services that are provided out of a common pool to other, more targeted resources.

Policymakers also should be aware of indirect costs because, on the other hand, they should not make inappropriate demands on managers to harness costs that are really uncontrollable by a single entity or individual. But neither should policymakers accept the sum of indirect costs as a given over which they can have little control or knowledge. Indirect costs are not a convenient garbage can in which to deposit costs that will require some effort to parse. There are some decision rules about what kinds of costs belong in or out of the indirect pool, and policymakers can benefit from this level of knowledge without the need to be analytically sophisticated.

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2. Ibid.

Exhibit 6–1

Indirect cost definitions

Indirect costs:
Costs necessary to the agency's functioning but benefiting more than one cost objective or not readily assignable to the cost objectives specifically benefited without effort disproportionate to the results achieved. These costs are often referred to as administrative costs, overhead, or support charges.

Indirect cost rate:
The comparison (ratio) of indirect to direct charges, expressed as a percentage. Indirect costs of $5.00 applied to a direct cost base (e.g., professional salaries and fringe benefits) of $10.00 yield a 50 percent rate.

Internal indirect rate:
The ratio of the unallocable costs of an agency or department to its direct cost base.

Jurisdictional indirect rate:
The allocation of the costs of the leadership and support functions of the overseeing jurisdiction to each member agency. The costs are divided by the direct cost base of the agency to arrive at a rate.

Other indirect rate:
The allocation of other relevant State or parent agency costs and the derivation of a ratio expressed as a percentage. Depending on locus and organizational structure, some agencies will not have such charges, thus not a rate.

Allocation:
The procedures or formulas used to distribute nondirect charges across the various users. These should always employ a measure that represents actual usage, for example, paychecks issued, number of employees, budget share, etc.

Cost analysts, of course, need to know not only of the existence of indirect costs, but their proper derivation, acceptable magnitude, and legitimate components. Excessively high indirect percentages can tarnish otherwise excellent analysis and do little to inform decisionmakers. It is incumbent on the analyst to minimize indirect costs.

Variations in indirect costs

Indirect costs vary in type, nature, and magnitude across criminal justice agencies. Different types of costs will be incurred for police than for prosecutors or corrections. There may be different administrative needs for different criminal justice system components and thus a different portion assigned to indirect. The NBI Project revealed that, depending on services provided and the difficulty of separating costs, the magnitude can vary from as little as 50 percent of direct costs to over 700 percent!

The NBI sitework also indicated that opportunities for variation are as numerous as the combinations of agency locus, type of parent agency, services provided externally, and organizational makeup of the agency or department itself. A sheriff's office lodged in the courthouse has a different pattern of direct and indirect costs than one operating

out of a freestanding building. Court-based probation will have a different cost structure than State-operated probation; the number and type of services provided by the relevant jurisdication and others will affect indirect levels and rates; the existence of a parent agency will also impact indirect distribution.

Types of indirect costs

There are three basic types of indirect costs with which the analyst must be concerned when estimating the costs of criminal justice activities:

- Internal.
- Jurisdictional.
- Other.

Internal indirect costs are those incurred at the program or activity level. For example, a secretarial pool at the courthouse or police station whose activities benefit all staff and also are difficult to assign would be considered an indirect cost internal to the agency. These would be the easiest costs to minimize as they are closest to the cost objective, but there will be an irreducible minimum that will necessarily represent services to all or a substantial portion of an agency's or department's activities.

Jurisdictional costs accrue when the immediate jurisdiction of the agency (e.g., city, county) provides unallowable services or otherwise expends resources on the agency's behalf. Perhaps paychecks are processed by the county, or there is a master switchboard at city hall. Ordinarily these are basic management functions that are not easily distributed among the various recipients, since many agencies may receive these services. On occasion, however, it will be possible—for example, city-sponsored training for police officers engaged in investigative activity would be allocated to police.

Other costs may be incurred when unallowable services are provided by an even more distant entity, such as the State providing services to a county or city. Pension funds might be administered statewide for all public employees, and thus some portion of the cost of providing this service would need to be assigned to the agency receiving the benefit. Or, there may be a "parent" agency providing services to all its members.

Assignment of indirect costs

Indirect charges occur at several governmental levels, from the agency where the LRU's work, to a remote office providing fiscal services.

Agency-level internal indirect costs

At the agency level, most indirect charges will appear in the agency's own accounts but will require time and effort to discern, assign, and allocate. They will vary for two reasons.

1. Even agencies "producing" the same thing may have different technologies; one agency may be more automated or capital-intensive than another; one agency may specialize more than another (a prosecutor in a small jurisdiction who does his/her own administrative work versus one who may assign such tasks to a general pool of support staff).

2. Clarity and accuracy of accounts will impact the number of charges that can be assigned directly; it simply may not be possible to extract all "logical" direct charges within the time and resources available for the cost analysis.

In general, the kinds of activities that are most likely to be performed directly by an agency but are more readily assignable to indirect include the following (as observed in the NBI Project):

- General supervision/oversight.
- Personnel management.
- Budget preparation.
- Equipment management.
- Management analysis and planning.
- Public relations.
- Volunteer and intern management.
- Internal affairs management.
- Records system management.
- Training.
- Information systems.

Division-level indirect costs

Some agencies, such as the police and the sheriff's office will be further divisionalized. For example, the sheriff's office will typically have a court service division, a road patrol or law enforcement division, and a correctional division. The officers who manage the division and their support costs are general to all of the different functions performed within the division. These costs constitute division-level indirect costs.

Examples of indirect costs in criminal justice

Police. The basic unit of analysis for police is a professional staff time unit such as minutes or hours expended by personnel such as Detective Goodnight and Officer McGruff. These individuals perform various functions; for example, investigation, patrol, and arrest. Charges that cannot be specifically allocated to these professional units at a function level are distributed as indirect costs. Such charges for the police at the agency or internal level include:

- Administration (the chief and secretary).
- Training staff.
- Personnel officers.
- Planning and research.
- Fiscal management.
- Records division.

Prosecution. The same analytical unit is used for Prosecutor Wily as for the police: a professional time unit. Because of the way prosecutors spend their time, the indirect cost categories not only might contain some of the items listed for police but also will include a substantial amount of time expended by the prosecutors themselves. Prosecutors observed in some sites of the NBI Project spent almost as much time (28 percent) engaged in reading journals, attending conferences and training sessions, talking with colleagues, organizing their desks, and reading correspondence, as they did in tasks that were related to a specific case (32 percent), such as preparing for court, doing legal research, and examining evidence. John Wily and his colleagues also contribute to indirect costs in the form of administrative time.

The time logs discussed in the section on direct costs and illustrated in the Appendix are essential also in the derivation of indirect/administrative charges. The distinction between indirect charges associated with prosecutors' time devoted to criminal-related activities and that expended on office functions is an important one. A (policy) decision to provide more office staff for "overworked prosecutors" could be the wrong one, if these professionals' time is really being taken up more with criminal-related activities than administrative ones.

Courts. The primary charges of an indirect nature that are incurred via the court budget include the administrative time of judges, office support staff, and the cost analyst. Many services are provided to Judge Mary Tell and her colleagues by agencies or funding sources external to the court proper; thus, derivation of court indirect—or true loaded resource costs—will require more diligence and access to more accounts than other criminal justice system components.

Sheriff. The paradox of Sheriff Smythe's office is that it is responsible for many of the support services enjoyed by other criminal justice system agencies. There are many functions lodged at sheriffs' offices, and some of the more highly organized make distinctions between operations and administration.

Probation and parole. The organization of the department of probation and parole will in large part determine the level and type of indirect cost. For example, a State-run system will have a different indirect cost structure than one that is locally managed. Departments with several functions will have a different structure than those with more limited responsibilities.

Corrections. Internal indirect costs at the department of corrections also will depend on the locus of the department but will ordinarily include those of central office or "downtown" as well as supervision or apprehension costs. These costs would be distributed over all institutions, while others might be indirect to a particular facility; for example, prison industries, and motor pool. In States such as the ones studied for the NBI Project, indirect costs might include charges for the director, deputy director, general central office costs, regional administrators' costs, district chiefs, superintendents at field and community units, operations and statewide support, and personnel services.

Derivation of indirect costs

Follow these steps to determine levels of indirect costs.

Step 1: Assign departmental indirect costs

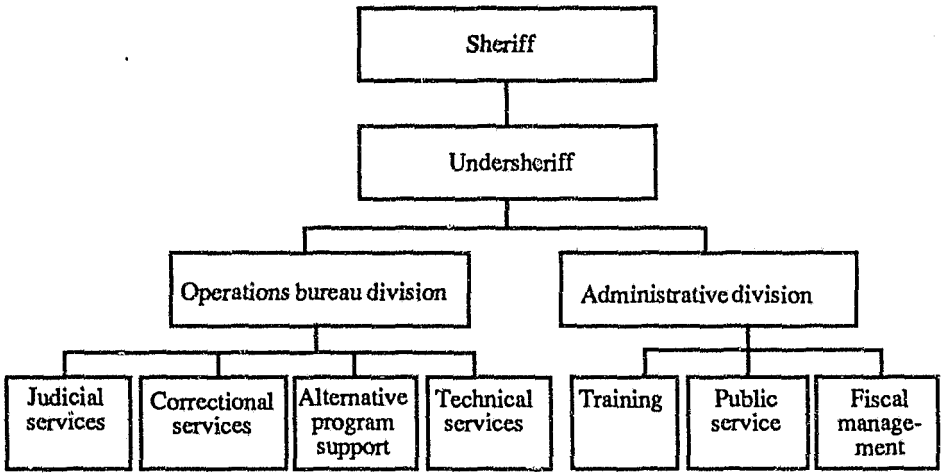
In some cases assigning departmental indirect costs will be unnecessary because all indirect charges appear at the agency or oversight level. But very large (e.g., urban) agencies might have some self-contained departmental units with some built-in support and leadership activities.

If the department is the functional equivalent of a single loaded resource unit, no distinction will be necessary. But more than one function or loaded resource unit will necessitate the pooling of all costs that cannot be directly assigned and designating them as departmental overhead. An example might be a police department where uniformed road patrol functions are lodged within one department, but other functions are not. Assuming these are separate in the analysis, one would then determine whether there are any leadership or support activities *within the department* that provide services to others. If so, and if the analyst cannot assign them directly, they would constitute a departmental indirect charge.

Sheriff Bud Smythe's office (a composite from the NBI Project) provides the basis for the application of the principles of indirect costs, and Exhibit 6–2 shows the organization chart of that agency.

Exhibit 6–2

Organization chart of Sheriff Smythe's department



Following his election, Sheriff Smythe reorganized the department and created two major divisions: operations and administrative. Administrative services include training, public relations, and fiscal management. The operations division provides judicial services, correctional services, and support services and programs. Technical services helps everybody. The sheriff has his own staff and budget.

The administrative division accounts for one level of indirect costs. All these services are necessary but unallowable to specific tasks in the judicial and corrections department. The analyst also has the option here of including the sheriff's costs as well as the building costs for administrative staff. The latter are straightforward; the former are not. Since the administrative division is equal in status to the operations division, it can be argued that Bud's time (if equally spent) should be allocated 50-50 between the divisions and then the administrative portion reallocated. For simplicity's sake, we place the sheriff's costs in the administrative division and will later create an agency rate for judicial and correctional activities.

Step 2: Determine content of budget and expenditure categories and assign costs

In the second step the analyst verifies the content of the expenditure reports by examining the detail of outlays and not simply accepting the broad categories as statements of "truth in spending." Auditors are generally more concerned with procedures and bottom lines than with whether each line item aligns properly with actual events. Use the chart of accounts, budget detail, and any documents that give explicit information on the nature of expenditures, and apply the general lessons of prior chapters. Do not accept a category such as "support services" on faith. Examine it to be sure it does not contain items that can be charged directly or misrepresent certain items. (One agency we examined had been denied a specific personnel line item but there was no limit on capital expenditures; they simply worked around the problem by entering a line item for a front-end loader and then hiring staff!)

A careful examination of the chart of accounts and actual expenditure data usually provides a clearer sense of cost distribution. The chart of accounts contains the actual subcategory definitions that explain exactly what expenditures compose the larger, umbrella line items. Expenditure reports tell where the money actually went (as in the case of our front-end loader). Within "utilities," for example, heat may not be allocable, but telephone charges might. Long distance charges could be extracted from billing statements. Fuel is another case in point. The vehicular usage (mileage) for different functions is a convenient allocation device. Each time the analyst is able to parse yet another general budget category, the decisionmaker gains more information on the kinds of ancillary resources used by the primary or focal resource unit. Thus, this section devotes more time to advising the analyst how *not* to charge indirect costs.

In this case, indirect costs are indeed a residual—not a garbage can for the lazy—but a carefully screened list of charges that cannot be allocated directly, that is, assigned to an agency's specific cost objective. We march through our chart of accounts and expenditure reports, assigning all the costs we can directly to either judicial or correctional services. The fugitive meals under "support services" made their way to the corrections category. A secretary who only types court orders found himself assigned to judicial services. A $10,000 item for court logbooks under "office supplies" was netted out and assigned to judicial services. Finally the analyst is left with a murky pool of costs that cannot be winnowed any further and have earned the right to be called "indirect costs."

Step 3: Select indirect cost allocators

In Step 3 we derive the best way to allocate indirect costs to the various direct cost centers they service. The ultimate rate, of course, is based on dollars; but the initial

distribution between cost centers can take many forms. The objective here is to find a way to distribute indirect costs in such a way as to reflect actual usage. (The Appendix provides a detailed example of different allocation mechanisms.)

The appropriate allocator in this case would be professional hours since time, not moneys, is a better proxy for support services needs. Thus, if 2,000 hours monthly were consumed performing judicial services and 1,000 providing correctional services, then support should be allocated on a two-for-one basis. (The glitch is, of course, determining time allocation; you may wish to use dollars in many cases.)

Since professional hours or time constitutes the allocator, how this is derived is our next task. Be sure that professional hours are used. In this case we have done the work for you and all division and sheriff's costs have been allocated in Exhibit 6–3.

Step 4: Calculate the indirect rates

There are numerous ways to compare indirect costs to direct costs and arrive at a rate. Some agencies and organizations take the ratio of indirect costs to all direct costs, others do not. Ordinarily we are looking for relationships that will remain constant over time as well as provide the best indicator of indirect costs. Sometimes indirect costs are deliberately assigned to an inappropriate base in order to make them appear low. There are still government funding authorities that fail to recognize the legitimacy and necessity of indirect costs and insist on regarding them as "profit." Exhibit 6–3, "Indirect cost rate calculation," illustrates several ways of distributing indirect charges and the resultant rates. You can use one of several bases: rate 1 uses total judicial services costs as the denominator, while rates 2 and 3 use variants of salary and fringe, or salary alone.

As we see, the costs are the same; it is the basis of calculation that creates the various rates. Bud would probably prefer to have his indirect rates appear low (because city council is very sensitive to wasteful overhead) and will use total direct costs (rate 1) as a basis. In our example, this procedure would yield a rate about one-half that derived by using salary and fringe as a base—yet costs are the same! Total direct costs should only be considered for use as a base if they are very stable over time.

Generally, a salary-based figure, while not perfect, will minimize distortion. Other direct costs may fluctuate over time; but salaries and fringe benefits are more likely to change only as a result of pay increases or increased staffing levels, which will in turn be reflected in the personnel component of indirect costs. Since we are allocating or distributing the indirect costs on the basis of professional time, a related base is appropriate.

Taking salaries plus fringe benefits as our base, we see that the judicial division has a divisional (operations) rate of 7.7 percent and an agency rate (including the sheriff) of

Exhibit 6–3

Indirect cost rate calculation for Sheriff Smythe's department

Judicial services direct costs			
Salaries	$100,000		
Fringe benefits	30,000		
Travel	25,000		
Supplies	10,000		
Rent	15,000		
Utilities	5,000		
Telephone	5,000		
Contractual	10,000		
Depreciation	5,000		
	$205,000		
Indirect costs (judicial share)			
a. Division	10,000		
b. Agency	30,000		
Indirect rates			
1. Total direct cost basis			
a. Division	10,000 / 205,000	=	4.9%
b. Agency	30,000 / 205,000	=	14.6%
2. Personnel cost basis			
a. Division	10,000 / 130,000	=	7.7%
b. Agency	30,000 / 130,000	=	23.1%
3. Salary-only basis			
a. Division	10,000 / 100,000	=	10.0%
b. Agency	30,000 / 100,000	=	30.0%

23.1 percent. An overall rate of 30.1 percent saves time but is slightly inaccurate. Add the indirect costs first if you must do this.

What the figures now tell us is that for every "professional dollar" expended at the sheriff's office, they also spend considerable money on other items (see Exhibit 6–4).

Exhibit 6-4

Ratio of personnel costs to other expenses

For every $1.00 spent on direct salaries, they also spend:

1. $0.30 on fringe benefits.
2. $0.25 on travel.
3. $0.25 on rent, utilities, and telephone ([$15,000 + 5,000 + 5,000]/$100,000).
4. $0.10 on supplies.

or a total of

5. $0.75 on other nonfringe direct costs ($205,000–$130,000).
6. $0.10 on divisional support (indirect) costs.
7. $0.30 on agency support (indirect) costs.

A dollar spent on salary requires the expenditure of another $1.45 to cover all the other costs of doing business ($0.75 other direct, $0.30 fringe, $0.40 total indirect). This is the final step in arriving at our loaded resource unit! The journey begun in Chapter 2 is nearly over. For every dollar spent on salary and fringe benefits we spend another 58 cents on other direct costs and 31 cents on indirect. Thus our direct costs are but half the iceberg. This analysis illustrates the very real support costs of public-sector operations as well as some clearer ways of presenting the data. It should also point up the need to keep indirect costs at the lowest possible level.

Step 5: Continue to allocate indirect charges

Step 5 is really a repeat of the earlier work but done at increasingly remote governmental units. There is room for some speculation on the analyst's part as to what charges might specifically apply; but generally, you will be looking at a pool of local and State administrative charges and allocating them down to Bud's operation using one of the designators listed above. Most cost analyses will stop well short of this level of detail. However, city and county governments do on occasion assess an "overhead" (another term for indirect) rate on projects or organizations within their domain for services rendered. The usual practice is to allocate charges based on the organization's (agency's) budget share of the county total.

Points to remember

Indirect costs are among the most important in performing the cost analysis taught in this manual. It is most tempting to leave them as a large pool, but to do so disguises the costs of doing criminal justice business that are tractable and reduces the areas susceptible of policy manipulation. The careful analyst first reduces indirect costs to

the lowest possible minimum, then selects an allocator that best represents an agency's usage of these charges.

1. The purpose of assigning indirect costs is, in part, to illustrate that the business of government is to enable the loaded resource units to perform their work on the relevant cost objective. In an earlier chapter we introduced this concept and demonstrated the role of the various direct and indirect charges. With the completion of the indirect cost analysis, all costs have finally been allocated and there are no missing resources or expenditure gaps in the system.

2. A financial share (percent of expenditure) or a workload measure (number of paychecks) are common methods of distributing indirect charges. Consider the services provided and select the one you can best justify.

3. Use a simple computation for indirect costs, not one that obscures the rate or makes it appear lower.

4. Remember to minimize the number of charges that must appear as indirect at the division or agency level.

Chapter 7:
Act 6. Conclusion


The City Tribune
Local News
Offender Processing Costs Total More Than Value of Stolen Goods
Police Break Bicycle Ring Led by 13-Year-Old

The purpose of this manual is the development and description of a methodology for estimating the costs of steps or activities in the criminal justice system. Many of the techniques are familiar to analysis but the use of criminal justice events as cost objectives is more unusual.

We began this manual by introducing two residents of Yourtown, John and Alice, with a summary of the costs of processing them through the criminal justice system. Then, the various techniques of deriving and loading these costs were presented with the colorful characters of Yourtown serving as a backdrop. The headline of Chapter 1, repeated here, should make considerably more sense.

In this chapter we reveal the story behind the headlines and provide the detail of the cases of John and Alice—a convenient focal point for reviewing criminal justice processing costs. We assume the reader is now well versed in cost objectives, loaded resource units, fringe benefits, capital, and indirect charges. Remember that *each event* we study represents fully costed resources drawn from across the system.

Using the information

The frustration and the beauty of this type of cost analysis is that all the work is condensed to a few tables and informed statements. Exhibit 7–1 combines the contributors to processing costs under cost objectives or steps in the process. The cost figures have been derived by multiplying the loaded resource unit (e.g., magistrate) by the time required to complete the step, which was discovered by the NBI Project in one city studied. Time requirements were determined by direct observation, time logs, and interviews. Of course, actual figures for Yourtown will vary from these examples. Given this information, you can follow two hypothetical cases through the byways of the criminal justice process and see how they accumulate costs. Here is how to use the map:

1. Locate the criminal justice processing step (cost objective) in the first column.

2. Find the base costs of each process by reading the "Cost per case" and totaling all figures not included in parentheses (optional steps).

3. Add to the total the costs of any optional steps that were taken with the given case or group of similar cases.

4. Continue along the left hand column, choosing appropriate processes and adding costs until final disposition.

Exhibit 7–1
Cost objectives and resource costs

(Parentheses indicate optional resource)

Cost objective resource unit	Loaded cost	Average no. units used	Cost per case
1.0 Arrest			
Patrol response	$33.60	3.10	$104.16
Patrol arrest	33.60	3.05	102.48
Detective	54.00	1.50	81.00
(Add'l investigation)	54.00	5.30	(286.20)
2.0 Booking			
Magistrate	15.60	0.50	7.80
(Sheriff)	46.34	1.00	(46.34)
(Commitment—24-hour)	291.92	1.00	(291.92)
3.0 First appearance			
District judge	85.80	0.26	22.31
Prosecutor	57.18	1.10	62.90
(Defense counsel)	63.57	1.00	(63.57)
Sheriff	30.60	0.26	7.96
(Court lockup—day)	130.90	2.50	(327.25)
4.0 Preliminary hearing			
District judge	85.80	0.81	69.50
Prosecutor	57.18	1.90	108.64
(Defense counsel)	63.57	1.00	(63.57)
Sheriff	30.60	0.81	24.79
Patrol officer	33.60	0.15	5.04
Detective	54.00	0.30	16.20
(Jail detention)	79.10	10.40	(822.64)
5.0 Grand jury			
Prosecutor	57.18	0.60	34.31
Patrol officer	33.60	0.50	16.80
Detective	54.00	4.00	216.00

(continued)

Exhibit 7–1 *(continued)*

Cost objectives and resource costs

(Parentheses indicate optional resource)

Cost objective resource unit	Loaded cost	Average no. units used	Cost per case
6.0 Circuit court hearing			
Circuit court judge	437.43	0.20	87.48
Prosecutor	57.18	0.70	40.03
(Defense counsel)	63.57	1.00	(63.57)
Sheriff	30.60	0.20	6.12
7.0 Pretrial motions			
Circuit court judge	437.43	0.33	156.23
Prosecutor	57.18	1.80	102.92
(Defense counsel)	63.57	1.00	(63.57)
Sheriff	30.60	0.33	10.10
8.0 Bench trial			
Circuit court judge	437.43	0.80	349.94
Prosecutor	57.18	2.50	142.95
(Defense counsel)	63.57	1.00	(63.57)
Sheriff	30.60	0.80	24.48
Patrol officer	33.60	0.50	16.80
Detective	54.00	1.00	54.00
(Jail detention)	68.48	29.80	(2,040.70)
9.0 Jury trial			
Circuit court judge	437.43	2.90	1,268.55
Prosecutor	57.18	9.20	526.06
(Defense counsel)	63.57	1.00	(63.57)
Sheriff	30.60	2.90	88.74
Patrol officer	33.60	2.50	84.00
Detective	54.00	3.00	162.00
(Jail detention)	68.48	29.80	(2,040.70)
Jurors	5.00	12.00	60.00
Jury management	376.66	1.00	376.66
10.0 Guilty plea			
Circuit court judge	437.43	0.63	275.58
Prosecutor	57.18	2.20	125.80
(Defense counsel)	63.57	1.00	(63.57)
Sheriff	30.60	0.63	19.28
(Jail detention)	68.48	29.80	(2,040.70)

(continued)

Exhibit 7–1 *(continued)*
Cost objectives and resource costs

(Parentheses indicate optional resource)

Cost objective resource unit	Loaded cost	Average no. units used	Cost per case
11.0 Sentencing			
Circuit court judge	437.43	0.50	218.72
Prosecutor	57.18	1.00	57.18
(Defense counsel)	63.57	1.00	(63.57)
Sheriff	30.60	0.50	15.30
(Presentence invest.)	487.60	1.00	(487.60)
12.0 Postconviction hearing			
Circuit court judge	437.43	0.40	174.97
Prosecutor	57.18	0.90	51.39
(Defense counsel)	63.57	1.00	(63.57)
Sheriff	30.60	0.40	12.24
13.0 Sentence			
Prison—year	21,687.00	1.89	40,988.43
Jail—day	62.77	60.89	3,822.07
Probation—month	34.70	11.97	415.36

The case of John

An example will demonstrate how Exhibit 7–1 works for a property offender. John is arrested and booked by Lionel and Gladys at a cost of $287.64 inclusive of patrol and detective resources. These officers cannot work alone, so their loaded hourly rate ($33.60 and $54.00, respectively) includes:

- Salaries.
- Fringe benefits.
- Property and records.
- Evidence technicians.
- Regional forensics lab.
- Clerical support.
- Supplies.
- Automobiles.
- Equipment.
- City administration.
- Police department administration.
- Divisional-level administration.

John arrives at the jail where a magistrate sets bail in 0.5 minutes ($7.80), and John happily returns home to explain his long absence at the grocery store. First appearance is held in district court the next day to determine if counsel is available and to set a

date for the preliminary or probable cause hearing. Being indigent, he is assigned counsel at an average cost of $63.47 per appearance. The taxpayers are billed $156.74 for John's first appearance—$22.31 for the judge, $7.96 for the bailiff, and $62.90 for the prosecutor, plus assigned counsel. Loaded onto the judge's hourly rate are:

- State administration.
- City administration.
- Judicial administration.
- Court clerk.
- Rent.
- Supplies.
- Equipment.

This brings the loaded hourly rate to $85.80 and the first appearance takes 15 minutes. Processing costs to this point are summarized in Exhibit 7–2.

Exhibit 7–2
John is arrested

Cost objective	Cost	Cost contributor
1.0 Arrest	$287.64	Police
2.0 Booking/bail	7.80	Magistrate
3.0 First appearance	22.31	L-J judge
	7.96	Bailiff
	62.90	Prosecutor
	63.57	Assigned counsel
Subtotal	$452.18	

A preliminary hearing is held in 3 weeks using $287.74 worth of resources; John is bound over to the grand jury, which indicts him for shoplifting at the Quik Stop at a cost of $267.11. About a thousand dollars ($1,007.03) has been spent to this point.

Several weeks later, the circuit court holds a hearing to affirm availability of counsel and set times for pretrial motions and a trial date. Since the defendant is still out on bail, the cost is only $197.20. Judge Mary Tell's loaded hourly rate of $437.43 is accumulated from:

- Salary.
- Fringe benefits.
- Court clerk.
- Clerical support.
- Reporters.
- Witness fees.
- Translators.
- Travel.
- Supplies.
- Rent.
- Equipment.
- State administration.
- City administration.
- Judicial administration.

Fortunately, the plea on a property felony takes only about 38 minutes and costs the taxpayers only $275.58 for the judge's time (see Exhibit 7–3).

A total of $484.23 is needed to cover the costs of judge, bailiff, defense counsel, and prosecutor when the plea is heard. Sentencing is delayed until next month, so John can find counseling paid for by his health insurance. Exhibit 7–3 summarizes the cumulative costs before sentencing.

Exhibit 7–3
John pleads

Cost objective	Cost	Cost contributor
1.0 Arrest	$287.64	Police
2.0 Booking/bail	7.80	Magistrate
3.0 First appearance	22.31	District judge
	7.96	Bailiff
	62.90	Prosecutor
	63.57	Assigned counsel
4.0 Preliminary hearing	69.50	District judge
	24.79	Bailiff
	108.64	Prosecutor
and	63.57	Assigned counsel
	5.04	Patrol
	16.20	Detective
5.0 Grand jury	267.11	Grand jury
6.0 Circuit court hearing	87.48	Circuit judge
	6.12	Bailiff
	40.03	Prosecutor
	63.57	Assigned counsel
10.0 Plea	275.58	Circuit judge
	19.28	Bailiff
	125.80	Prosecutor
	63.57	Assigned counsel
Subtotal	$1,688.46	

Throughout the circuit court proceedings, a bailiff has been standing in the background asking everyone to rise, calling cases, and generally directing traffic. Her services are compliments of Sheriff Smythe, as are operation of the court lockup (which John did not need), court security, and hauling prisoners from the old jail located down the street. The bailiff's hourly salary and fringe rate is loaded with:

- Supplies.
- Rent of courthouse space.
- Equipment.
- Training academy.
- City administration.
- Sheriff's department administration.
- Division-level administration.

Taken together, you must use $30.60 as the full cost of an hour of labor from the bailiff. John accepts a penalty of private counseling and 12 months probation ($416.40) at the sentencing hearing, which costs $354.77. (A presentence investigation and time in court by a probation officer would have added $487.60.) These final steps bring the cost of his case to $2,459.63, as illustrated in Exhibit 7–4 on the following page, "John is sentenced."

Remember that John was free on bail, not held in pretrial detention; had appointed counsel; foreswore pretrial motions; did not demand a jury trial but pled guilty; and received a probation sentence with counseling services paid from his health plan.

Alice's conviction for receiving stolen goods is a different story that you can track through the criminal justice steps.

The case of Alice

Alice is no stranger to the justice process, having been initiated somewhat as a juvenile shoplifter (although we are not supposed to know this). Her adult experiences have included indictments for burglary, possession of controlled substances, and auto theft, which the prosecutor turned into three convictions. This time, investigation shows Alice washing her clothes and dishes with the booty from an appliance warehouse burglary. Officer McGruff and Detective Goodnight arrest her for possession of stolen property; cost: $573.84 (see Exhibit 1–3, page 4). Her history and situation lead the magistrate to set $50,000 bail, which Alice cannot pay; and she is held at the jail pending first appearance in district court. Booking and admission to the jail has added $346.06, for a total of $919.90.

Exhibit 7–4

John is sentenced

Cost objective	Cost	Cost contributor
1.0 Arrest	$287.64	Police
2.0 Booking/bail	7.80	Magistrate
3.0 First appearance	22.31	L-J judge
	7.96	Bailiff
	62.90	Prosecutor
	63.57	Assigned counsel
4.0 Preliminary hearing	69.50	L-J judge
	24.79	Bailiff
	108.64	Prosecutor
and	63.57	Assigned counsel
	5.04	Patrol
	16.20	Detective
5.0 Grand jury	267.11	Grand jury
6.0 Circuit court hearing	87.48	G-J judge
	6.12	Bailiff
	40.03	Prosecutor
	63.57	Assigned counsel
10.0 Plea	275.58	G-J judge
	19.28	Bailiff
	125.80	Prosecutor
	63.57	Assigned counsel
11.0 Sentencing	218.72	G-J judge
	15.30	Bailiff
	57.18	Prosecutor
	63.57	Assigned counsel
13.3 Supervision	416.40	Probation
Total	$2,459.63	

The sheriff's transportation unit moves Alice to the courthouse for her first appearance where she is held in court lockup by the sheriff ($130.90) pending the call of her case. Being indigent, Alice is assigned counsel to represent her. The hearing cost is $483.99, compared to John's $100.97. Typically several such appearances would have been necessary to complete assignment of counsel, thereby requiring about 2.5 days in jail before the hearing is completed.

After a preliminary hearing in district court ($1,110.38), Alice is bound over to the grand jury, where she is indicted under the habitual offender statute ($267.11). A circuit court hearing and pretrial motions (of which there are many) bring the cost of Alice's case before trial to $3,311.40.

Exhibit 7-5
Alice before trial

Cost objective	Cost	Cost contributor
1.0 Arrest	$573.84	Police
2.0 Booking	346.06	Magistrate Sheriff Jail commitment
3.0 First appearance	483.99	District judge Prosecutor Defense counsel Police Sheriff Jail detention
4.0 Preliminary hearing	1,110.38	District judge Prosecutor Defense counsel Police Sheriff Jail detention
5.0 Grand jury	267.11	Prosecutor Police
6.0 Circuit court hearing	197.20	Circuit judge
and **7.0 Motions**	332.82	Prosecutor Defense counsel Sheriff
Total	$3,311.40	

A jury trial requires Bud Smythe's department to draw a jury pool. So, to the costs of the judge, prosecutor, bailiff, transportation, lockup, and defense, we add the payment of jurors. Exhibit 7–6 illustrates the trial costs: $4,670.28, which includes $2,040.70 for almost 30 days of jail detention time.

Exhibit 7–6
Alice goes to trial

Resource	Cost	Cost contributor
Jury management	$376.66	Sheriff
Jurors	60.00	Court
John Wiley	526.06	Prosecutor
Bailiff	88.74	Sheriff
Detention for 29.8 days (including transportation)	2,040.70	Sheriff
Mary Tell	1,268.55	Court
Attorney assigned	63.57	Court
Patrol and detectives	246.00	Law enforcement
Total	$4,670.28	

The jury surprisingly finds Alice guilty of unauthorized use of an appliance (she claimed ignorance of its suspicious origins)—a misdemeanor punishable by up to 6 months in jail and/or 1 year of supervised probation. A presentence investigation ($487.60, including her probation officer's time at the hearing) ordered by the judge finds that the offender is a waitress at an eatery called Alice's (no relation) and the sole provider for five siblings. The appliances, slightly used, have been returned to the rightful owner. The sentence: 12 months probation ($416.40) and 60 days in jail ($3,766.20) to be served on weekends. Your estimate of the cost for this sentence should include the items in Exhibit 7–7 on the following page.

Assuming Alice is not revoked from probation ($316.57) and does not receive additional time in the jail or even State prison, her case will cost $13,006.65 from beginning to end. This is greater than five times the amount required for John, the shoplifter. Of course, the average cost of an incarceration day we used is not the marginal cost of adding Alice to the jail population. (See Epilog for a discussion of marginal costs. The point here is that adding one person to a prison, jail, or a probation caseload does *not* increase outlays by the average cost, but only by a fraction.)

John and Alice have each journeyed through a criminal justice process but decisions made by the magistrate, the prosecutor, the defense counsel, and the judge have

Exhibit 7–7
Alice's experience

Cost objective	Cost	Cost contributor
1.0 Arrest	$573.84	Police
2.0 Booking	346.06	Magistrate Sheriff Jail commitment
3.0 First appearance	483.99	District judge Prosecutor Defense counsel Police Sheriff Jail detention
4.0 Preliminary hearing	1,110.38	District judge Prosecutor Defense counsel Police Sheriff Jail detention
5.0 Grand jury	267.11	Prosecutor Police
6.0 Circuit court hearing	197.20	Circuit judge Prosecutor Defense counsel Sheriff
7.0 Pretrial motions	332.82	Circuit judge Prosecutor Defense counsel Sheriff
9.0 Jury trial	4,670.28	Circuit judge Prosecutor Defense counsel Police Sheriff Jail detention

(continued)

Exhibit 7–7 *(continued)*

Alice's experience

Cost objective	Cost	Cost contributor
11.0 Sentencing	842.37	Circuit judge Prosecutor Defense counsel Sheriff Probation
13.0 Sentence	4,182.60	Jail Probation
Total	$13,006.65	

produced quite different costs (see Exhibit 7–8). Holding one defendant more than 12 hours added $338. Alice's detention for 40 days while awaiting trial added more than $2,800. Defense counsel's request for a jury trial added $4,519 over John's plea. And finally, Judge Tell's commitment of Alice to jail for 60 days (after a presentence investigation) increased corrections costs by $4,254.

Exhibit 7–8

John's and Alice's experiences compared

Phase	John	Alice	Decisions
Arrest/Booking	$295.44	$919.90	Investigation Pretrial release
Pretrial process	908.79	2,391.50	Detention Pretrial motions
Trial	484.23	4,670.28	Jury trial Detention
Sentence	771.17	5,024.97	Investigation Jail term

The large differences in costs between John's and Alice's processes do not suggest that either case should have been handled differently. John, a petty thief, received a minor punishment. Alice, by virtue of her prior record, drew greater attention and received a somewhat more severe sanction.

The important lesson is that each decision has its attendant costs, and that these costs are borne by a variety of agencies involved in the criminal justice process.

Unlike cost analysis of a discrete organizational unit, no one can be held "responsible" for the costs of these or other cases. Each agency, of course, can be held somewhat accountable for their respective contributions to cost; but even here, certain costs are determined by decisions outside even the jurisdiction: the legislature may set the salaries of circuit court judges, sheriffs, and prosecutors; the State supreme court establishes assigned counsel fees, but the grand jury's decision will determine if these are $191, $382, or $573 for a case.

An analysis of case processing costs dramatically illustrates the formidable task facing officials responsible for shaping crime control policy. There is no single cost or resource "faucet" one can turn on or off at will, or even a single decisionmaker who can create and implement policy. The above cases demonstrate how separate levels of government, different agencies, and each individual who makes a case decision can independently affect demands for criminal justice resources. Implementation of well-intentioned crime control policy affects demands in a similarly fragmented, uncoordinated fashion. Interestingly, this fragmentation is a result of the constitutional requirement of "separation of powers" and "all powers not expressly granted." Therefore, it should not be unexpected that case processing costs accumulate at a rapid and often seemingly random rate—one branch of government makes decisions that affect costs in another branch.

Chapter 8:
Epilog

This manual's purpose is the presentation of cost analysis techniques for criminal justice events. The approach is personalized and, we hope, lightened by the use of some not-too-real characters and some very real headlines. Our overall goal is enjoyable enlightenment, but we also believe that the analysis can be very important to policy decisionmaking.

In this final chapter the interested reader can find concepts and tools that do not directly fit in the manual proper but are nonetheless useful in conducting analysis.

Cost contributors and cost users

Both analyst and policymaker should be aware that there are no clean cuts on the costs of criminal justice system agencies. Services are provided by one agency to another, and these must be netted from the accounts of the contributor and added to those of the user if one wishes to determine true resource usage. The various criminal justice agencies (police, courts, and sheriff) serve as convenient cost repositories, but in fact criminal justice events make difficult our desire to create discrete funding entities. We found that contributors and users of resources (costs) are fairly constant across jurisdictions, but the analyst must always be on the lookout for "hidden functions."

Thus, a policymaker seeking information on police or court costs should be aware of the *services* each performs and the *resources* used in the process. A court appearance, for example, will require resources of police, prosecutor, defense, court, and sheriff; yet we tend to think of it as a court function. To only include the court's share of the resources necessary for appearance would seriously understate the taxpayer moneys necessary to conduct this event. In a similar vein, we must carefully allocate the resources contributed by other units of government to court events or these others will appear to have high costs for their own activities. The sheriff, for example, has many court-related duties, the cost of which should be excluded from patrol, booking, or incarceration activities.

Cost allocation

Whether for direct or indirect costs, the matter of allocation is perhaps the most important in estimating criminal justice processing costs. Another way of expressing the issue is to ask: "How do we distribute costs over the various analytical units we

are studying?" Some primary considerations in cost allocation are discussed below. Other sections of this manual addressed the need to determine which resources are used to carry out some function or activity.

Level of cost

Cost allocation or distribution should be performed for every level of cost. Personnel costs, rent, and indirect costs are all capable of distribution or assignment to a resource unit engaged in or producing a cost objective. Some costs will directly follow the allocation of some other resource; for example, secretaries and keyboards, people and desks. Others are less obvious and will require decision rules as discussed in previous chapters.

Unit of analysis

Cost allocation should follow the unit of analysis, whether this be professional time, offender per diems, offender categories, or criminal justice event. While the total costs for a particular category—for example, personnel—will only be estimated once, the distribution of these and other costs will depend on the analytical question being asked. In probation we might want to know the distribution of costs by crime type—for example, violent offender or robber—*or* we might want to know the costs by departmental function; for example, presentence investigation.

Resource usage

Cost allocation mechanisms will vary as necessary to express resource usage. One allocator may work in one setting but not in another. In the case of a training officer, time would be the proper allocator. In fact, time—or its proxy—will be the most common allocator for most identifiably human resources. The use of a proxy may be warranted if analytical time is short, since the maintenance of logs is costly and time consuming. However, the analyst should always ascertain what staff and other resources actually do. It may not be desirable to perform a time and motion study to determine actual use, but some effort should be devoted beyond the acceptance of job titles.

When allocating nonhuman resources such as office space, try to keep the analysis simple. For example, square footage per person is likely to be the best allocator of office space; so if we have 1,000 square feet and the prosecutor's function accounts for half of the personnel using the space, we can distribute by person. If the space were used for manufacturing, the reader should quickly see that the above allocation might not work because one business or function might have more equipment than another.

The allocation of indirect costs should also reflect usage. Yet many inadequate analyses have simply used a percentage of dollar volume between one agency and an umbrella agency to express usage. These allocations are not necessarily incorrect; rather, it is important that the analyst derive them from an actual analysis of use and not accept a given figure. For example, payroll department allocations could be derived from the actual workload, that is, number of paychecks issued per time period. Building maintenance costs should follow square footage allocations. Support and leadership functions should be divided according to the time and effort devoted to the direct activity.

Alternatives

Consider alternative cost allocators. Sometimes it is necessary to look at the activities in question and consider more than one allocator before making the final decision. As with any analysis, the effort expended should not be disproportionate to the benefit received; don't spend all day allocating a $50.00 postage expenditure. An example of where several allocation schemes could be used, but where one is clearly the best, occurs in transportation. The following case study is directly derived from NBI Project data.

Case study—transportation services

Sheriff Bud Smythe was displeased when he learned you had reported to the council that his indirect rate as a percent of salaries was 30 percent. He read this manual and decided to fight analysis with analysis by showing just how much he does for everyone. Since he wants five new cars this year, Bud thinks transportation will be a good activity to prove his point. Several road deputies spent 2 days poring over trip logs to compile the following table:

Exhibit 8–1
Transportation services provided by Sheriff Smythe

Purpose	Number of trips	Miles per trip	Total miles	Percent of miles	Hours per trip	Total hours	Percent of time
Mental patients	156	85	13,260	38.7	5	780	22.9
Juveniles	520	12	6,240	18.2	1	520	15.2
Hospital	105	2	210	.6	4	420	12.3
DOC	32	450	14,400	41.9	16	512	15.0
Normal court	184	1	184	.5	2	368	10.8
Arraignments	47	1	47	.1	2	94	2.8
Subtotal	1,044	NA	34,341	NA	NA	2,694	78.9
Preparation						720	21.1
Total	1,044	NA	34,341	100	NA	3,414	100

After seeing the results, the sheriff was even more convinced that he could justify those new cars, give you a surprise during budget hearings, and maybe even get a higher reimbursement from the State department of corrections (DOC). Unfortunately, his deputies had not read this manual (nor were they politically astute), so they recommended that he present Exhibit 8–2.

During the budget hearing you correctly point out to the sheriff that miles traveled is not the only measure of resource use. In fact, time is a more useful allocator because officers' time is the costliest variable. Thus Exhibit 8–1 presents a quite different and more accurate picture, viz., the State Department of Corrections receives only 15 percent of the services if the correct loaded resource unit of officer time is used. Nor is number of trips a

Exhibit 8–2
Allocation of Sheriff Smythe's transportation costs

Purpose	Percent of miles	Allocated costs (# of miles driven x total cost)
Mental patients	38.7	$44,851
Juveniles	18.2	21,093
Hospital	.6	695
State DOC	41.9	48,560
Normal court	.5	580
Arraignments	.1	116
Total		$115,895

good allocator because juveniles are transported only 10 blocks and 50 percent of the total trips require slightly over 15 percent of officers' time. Support for the new vehicles evaporates (everyone is receiving about the same level of service); the deputies are transferred to jail duty; and the State lowers its reimbursement to the sheriff!

It is true that sometimes it is not necessary to perform elaborate allocation analysis. There are times in which the allocation is very obvious. "Meals served" as an allocator for a food budget is one example. Even if there is some slight disproportionate usage, the allocator is a close one and the cost of an individual meal is very low. But this case study illustrates that sometimes we must look at more than one allocator to see which best represents resource utilization. Exhibit 8–3 on the following page illustrates some typical situations and the appropriate allocation mechanism to use when performing cost analysis.

Marginal and average costs

The distinction between marginal and average costs is one of the most important in criminal justice. The marginal cost is the increased cost of producing an extra unit. For example, the extra cost of adding a prisoner to a jail already holding 300 inmates would be termed the marginal cost of the prisoner. Generally we would expect that the additional prisoner could be absorbed without adding a building, new guards, and the like. Hence the extra cost is marginal and would include items such as food, clothing, and other supplies.

Exhibit 8–3
Cost allocation techniques

Type of cost	Cost allocation	Comments
Transportation	Travel time	Assumes equivalent resources
Food service	Meals (people x 3)	Assumes meals equal in value
Professional staff	Time on cost objective	Requires logs
Support staff	Professional time, if staff is targeted	Allocation is only as good as prof. staff
Building and equipment	Square footage of functions	See "Capital" in Glossary
General leadership; supervision	(1) time logs of general activities; (2) time estimates of leaders; (3) proportion of professional staff; (4) volume of work or level of expenditure	Select best option, not necessarily easiest
Utilities	Actual usage as shown in bills; prorate base charges; use square footage for heat, populations for water (jail uses more water than court)	Sometimes hard to prorate; some may appear as indirect
Supplies	Office supplies follow professional staff time; client supplies (clothing, etc.) follow ADP or admissions	O.K. to follow staff proportionately
Consultant or contracted services	Professional follows staff; general (e.g., accounting) should follow support; community services would follow clients directly	May require extensive budget review to determine what kind of services

Average cost is the cost per prisoner. If the marginal cost of a prisoner is, as we have suggested, very low, then the average cost would be decreased by adding the 301st prisoner to the above described jail. In this manual we have focused on estimating the average costs of criminal justice processes or events.

Fixed and variable costs

To better understand average/marginal cost concepts, first consider the economic distinction between fixed and variable costs. Ordinarily, economists speak of fixed costs as representing those resources that cannot be varied within the short run and variable costs as those that can. However, in many cases, the traditional view of land and capital as representing the ultimate fixed cost and labor as representing a variable cost is irrelevant to the real world we study. For many endeavors, the labor resources are virtually fixed in the sense that they will not vary across very large ranges of output. For example, how many prisoners must be released before a guard will be laid off? It might indeed be the entire prison. How low must caseload go before a prosecutor will be terminated? In fact, personnel costs, which in human service activities may account for 75 percent of total outlays, are not variable at all, but constant for large numbers of clients.

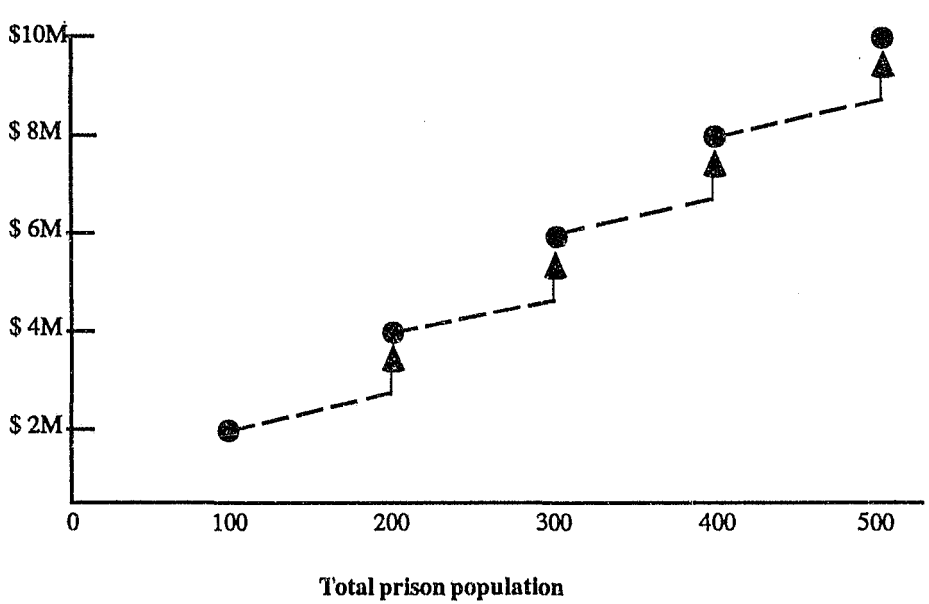
The paradox of average cost

The flip side of the discussion of when staff will be terminated is the discussion of how many additions to caseload can there be before an increase in capital is required. Average cost in the activities we are discussing here is a residual. By that we mean that it is derived by simply dividing one number (usually staff or offender population) into another—usually total expenditures. Thus, the average daily cost per prisoner is obtained by dividing total daily costs by the inmate population. As the population rises, this average cost figure will be reduced arithmetically. Some regard this as a cost saving or a more efficient, lower cost per inmate. Beyond capacity this is a fallacy as it would represent a reduction in services, guard coverage, and the like. Therefore, comparisons of criminal justice activities and especially incarceration-per-day costs should be attempted gingerly and only when armed with the most complete information. Few would argue that a class with 500 students and one teacher is comparable to one with 15 students and one teacher. The courts apparently share this sentiment as more States find themselves in trouble for prison crowding. But the point here is that we should not succumb to the trap of believing that lower costs alone mean more efficient operations. Thus, the effects of policy decisions on costs are often difficult to determine and sometimes surprising as well. A policymaker seeking to reduce costs might support policies to reduce prison populations because the average cost is so high; for example, $20,000 per year per inmate. But the practical result of releasing prisoners early may be only a slight, perhaps imperceptible reduction in costs. Why? Because so many costs are fixed, that is, they do not vary with small changes in output. (These include outlays for correctional officers, rent, most utilities, professional staff, administrators, and the like.) When we release 20, 30, even 100 prisoners from a 1,000-bed prison, all that is saved is the marginal cost of caring for

these individuals: food, clothing, medication, and some supplies. These costs will seldom amount to even 10 percent of average costs. If we reduce the cases processed by the prosecutor's office, a small difference in supplies and telephone charges might be observed, but little else.

By the same token, we can increase the demands on a particular department; and, in the short run, nothing will happen in the ledger book, because at the margin the costs of producing a little bit more are small. However, on this side, we might see some changes in upward budget requests to compensate. People are probably less likely to assume a downward trend will continue, so requests to reduce the budget are unlikely. Exhibit 8–4 illustrates the "stair step" function assumed by prison costs. The figure may be used to assess cost impacts of increases or decreases in population. Assume populations are growing. At 100 inmates and $20,000/year operating costs for each, $2 million is required to run the prison. As the population grows, there are small, marginal increases for food, clothing, and supplies. However, when we have 200 inmates—and these breakpoints will vary in different systems—then we need considerably more teachers, officers, administrators, and program personnel. There our costs jump to $4 million.

Exhibit 8–4
Total prison costs as a step function



Public policy implications

Thus, the savvy policymaker reading and implementing this manual will understand that the accumulated costs of a criminal justice event will not disappear if one offender fails to avail himself of these processes. The system will not save the thousands of dollars it costs to process one case by reducing the caseload by one person. Similarly, as average costs fall lower when prison capacity is exceeded, the new costs necessary to operate a constitutional prison will seem to take an enormous jump.

This does not imply that we should dismiss the idea of cost containment but implies rather that we understand why problem resolutions often do not accomplish what we expect. The high and often intractable costs of justice suggest that we should scrutinize all new and existing policies precisely because we can become locked in to a new and higher level of costs with but a stroke of the pen.

Cost savings and resource reallocations

A related issue concerns how much we can save through our criminal justice economies and how much we can reallocate. As a practical matter, if we reduce prosecutorial caseload, or probation clients, or cases before the judge, or prisoners at the jail, or criminals on the street, the most likely effect is not more dollars in our taxpayer pockets because we "saved" money but a new-found freedom on the part of the resources to reallocate their efforts. In other words, the prosecutor might now have more time to devote to the remaining cases and the quality of justice could rise. Too much of this good thing and he or she may simply spend more time reading and organizing the desk. We leave it to the reader to discern when such a point is reached.

But in fact this resource reallocation is the way the system buffers itself against short-run changes. It is necessary for two reasons:

- Resources, especially human ones, occur in lumps, so that we cannot lay off 1/100 of one person or hire 1/20 of another.

- To make these minute adjustments every time something changed would create a system of great instability. On the other hand, the analyst may be interested in exactly what these plateaus are—the better to see if budget increases are justified.

We pay a price for stability and hope that on average everyone is doing the job. Again, the policymaker should be sensitive to the real effects created by a campaign to cut cost. Thus, if caseloads of some office are being reduced, the watchful and responsible public servant should inquire, even demand, to know the internal readjustments that should result as the pressures on present resources are reduced. We have freed people to perform their jobs better and may want to see some evidence of this.

Similarly, when caseloads go up, we might expect to see some deterioration of services.

Conclusion

If a new awareness of criminal justice system costs, their contributors, and their containment or intractability results from review of this manual, then it has accomplished its goal. The NBI Project produced enlightenment on the sources and levels of costs of criminal justice processing in the United States. This manual takes that work to the final step by reproducing the analytical techniques and qualifying their use.

Glossary

Accrued liability: A cost incurred but for which no expenditure is yet due. Sick leave, vacations, and, in some systems, retirement are accrued for each month of an employee's work. However the expenditure is not made until the employee actually is sick, takes vacation, or retires. An accrued liability for retirement, for example, may be distinguished from a retirement policy. A policy with a financial carrier becomes the liability of the carrier rather than the agency paying for the policy. On the other hand, if the retirement is to be paid from the agency's budget at some time in the future, it is an accrued liability.

Average daily cost: The cost of providing services (e.g., housing, food, counseling) to a client for one day. It is calculated by dividing total operating costs (including operating capital costs such as maintenance and repairs) by the average daily population and then dividing the results by 365 (days).

Agency indirect cost: The cost of agency managers, support staff, and other support not directly assignable to specific cost objectives. Examples include the cost of the commissioner's office in a State department of corrections, the cost of the police chief's office in a police department, and the cost of the sheriff's central administration in a sheriff's office.

Capital: Those resources, such as prisons, jails, and equipment, that have long-term life expectancies. The cost of capital construction and utilization, therefore, extends beyond the duration of an accounting year. Consequently, the value of capital resources used in any one year should be determined by depreciating the value of capital stock.

Capitalized: Capital cost spread out over several years.

Cost objective: An activity upon which a separate cost allocation is desired. For example, the desire to see the cost of an arrest separate from the costs of investigation would make the arrest function a cost objective (and presumably, investigation a cost objective). On the other hand, for current purposes one might wish to have simply the cost of investigation and arrest in which the two together would form one cost objective.

Causality: A causal relationship is a statement of cause and effect (e.g., A causes B to occur). Causality is an important criterion in allocating costs. Analysis should identify the resources (staff, automobiles, etc.) that in theory are necessary causes of program outcomes when estimating the costs of a program. Similarly, benefits or

program effects should be caused by or result from the program to be included in a cost.

Comparative cost analysis: A comparison of the value of resources (inputs) used in two or more program activities. It is used when a decisionmaker is deciding whether to allocate resources to one program or another, both of which have different organizational schemes (i.e., production processes).

Cost: The value or resources utilized in a production process or in the provision of services represent an economic cost. The cost includes all value consumed in the production process, including that which is accrued but not expended. Since the value consumed may be only a part of the expenditure (as in capital) or not yet reflected in expenditures (as in accrued liability for vacation) cost should be carefully distinguished from expenditure.

Cost allocation: This technique involves allocating costs from one program (or budget) to another. For example, the costs that an executive agency such as the treasurer's office incurs in management and oversight of a correctional agency's program(s) should be attributed or allocated to the total cost of the correctional program(s). Cost allocations should be based on materiality and causality.

Cost analysis: The assessment of the value of resources (inputs) used in a process, program, or activity.

Cost-benefit analysis: A technique for measuring the return on investments in social programs. Benefits are quantified in dollar terms—the future stream of benefits are reduced to their present value—and related to program costs. Positive net benefits (benefits-costs) or a benefits-costs ratio (benefits/costs) greater than one, indicate an efficient expenditure.

Cost contributors: As used in the NBI study, cost contributors refer to the various actors or agencies that perform parts of a cost objective in the criminal justice process. For example, a cost objective in the processing of an offender is a preliminary hearing. Contributors to the cost of a preliminary hearing may include the court (judge), the clerk of the court (a separate agency), the prosecutor, the public defender, the sheriff (bailiffs), and the police (as witness).

Cost-effectiveness analysis: A process for relating the value of inputs to measurable results for the purpose of comparing which of two or more ways of producing results is more efficient.

Depreciation: A systematic process of allocating the cost of capital items over the time of their use. Although the expenditure for a capital item may occur in a single accounting period, the consumption of value of the item may occur over many years.

Depreciation allows the proportionate cost of the item associated with its use during a specific time period to be assessed.

Direct costs: Those costs incurred directly in the provision of a service or in the production of an output.

Discount rate: Since the value of a future stream of benefits and costs is less than its current value, they should be converted into present values by reducing their monetary value in accordance with a discount rate.

Division indirect costs: The indirect costs associated with divisional managers and their support internal to agencies with multiple divisions.

Expenditures: Actual outlays for government programs. Expenditures differ from budgets in that budgets are only intended or planned allocations whereas expenditures are actual allocations. It is advisable to estimate program costs from expenditures rather than budgets.

Expensed: A capital transaction classified into operating costs.

External costs: Costs incurred outside the unit being analyzed. For example, in assessing the costs of a correctional program, other criminal justice system costs (such as police or court costs) incurred as a result of the correctional program are considered external costs.

Fixed cost: During a given time period, certain costs are fixed. That is, a certain level of costs will be incurred regardless of the level of output produced. For example, it may cost $1 million to heat a prison for a certain time period whether there are 500 prisoners in it or only one.

Fringe benefit: The nonsalary benefits provided to personnel as additional value for labor. These include all costs to the employer in which the employee receives value beyond salary. Examples are insurance, retirement (including FICA), worker's compensation, vacation, holidays, and sick leave. In some cases, training and uniforms may be included as fringe benefits (additional value) to the employee.

Fringe rate: The ratio (normally given as a percentage) of the total cost of fringe benefits of employees to their salaries for the time worked. For effective calculation, the time worked does not include the salaries paid for vacations, holidays, and sick leave since these costs are part of the fringe benefit.

Indirect cost: The costs that are incurred for a common or joint purpose and not readily assignable to the cost objective specifically benefited (e.g., overhead or administrative costs).

Input: Labor, capital, technical knowledge; and in rehabilitation programs, client needs that are combined to produce some resulting product or service.

Jurisdictional indirect cost: The indirect costs associated with a jurisdictional unit of government overseeing the performance of an agency. In the NBI project, these costs included the managerial costs (usually financial) of the city, county, or State of which the police, sheriff, or agency are subunits.

Life cycle cost: The total cost of capital during its useful life. The life cycle of a capital item is affected by cleaning, maintenance, replacement of consumable parts, and the like. These additional costs are added to the capital cost to form the life cycle cost.

Loaded resource unit: The dollar value of the total cost of a resource necessary to the performance of a cost objective. In the current study, these costs include all of the support costs, indirect costs, and allocated capital costs associated with the resource unit.

Marginal costs: The incremental costs incurred in providing one additional unit of output. For example, the cost of adding one inmate to the prison should only include the extra expenses for food, clothing, supplies, and so forth—NOT the average cost.

Materiality: A principle for deciding if a cost allocated to a particular program is of sufficient magnitude to make it worthwhile to include the cost in the total cost of the program.

Operating costs: Ongoing costs of running a program, activity, or service. Operating costs include such items as personnel, supplies, and transportation. The main distinguishing features between operating costs and capital costs are that the former are incurred as the resources are used, and the use of the resources is for a relatively short duration.

Opportunity cost: The cost of forgone opportunities represents the price that resources would command in alternative uses. For example, the value of prison land might include forgone taxes, that is, the amount of taxes that would be collected if the land were alternatively used for residential purposes. Opportunity costs are "real" costs and serve as estimates of the value of resources that do not have market prices in their present use.

Output: The goods, service, or effect that results from transforming inputs (labor, capital, technical knowledge).

Present value (present worth): Future benefits and costs are generally of less value than present costs and benefits because of inflation. A future dollar purchases less

than a present dollar, therefore future dollars should be discounted or converted to their present values so that the stream of costs and benefits are equivalent. (See discount rate.)

Proxies: Substitute measures, which are used when actual measures are not available, are called proxies.

Resource unit: The principal unit of measure for the resources necessary to produce an output. In the NBI, the resource unit for most of the cost objectives was a minute or an hour of professional time. For example, the resource units for police objectives were a detective hour and a patrol officer hour. For the sheriff's cost objectives, several different resource units were used: a jail day, court trip (transportation), completed booking, and court security officer hour.

Straight-line depreciation: A method of depreciating capital items based upon the assumption that the value of the item is equally distributed over its useful life. If, for example, a patrol car is assumed to have a useful life of 5 years, the cost of the vehicle would be allocated equally over a 5-year period.

Sum-of-the-years'-digits depreciation: A method of depreciating capital that assumes the useful value of a capital item is greater in the first years of its useful life and decreases systematically through its last year of utility. In this method, an item with 5 years of useful life would be assumed to have 5 units of value in its first year, 4 units of value in the second year, and so on to 1 unit of value in the fifth year. The method calls for summing the "digits" (the units of values or years) to obtain the total units of value. The ratio of the units of value for a given year to the total units can be multiplied times the total cost of the item to allocate the capital cost for the given year.

Sunk costs: Capital costs previously incurred on a capital item. These costs include already depreciated capital and previous repair or capital-added costs.

Time-use study: Time-use studies are conducted by measuring the time it takes for labor or machines to complete an activity or produce an output. The time factor can then be used to estimate the resource cost used in the production process. For example, if it takes 5 person-hours to transport prisoners from a jail to the courthouse and return, and wages are $10 per trip, then the labor component of transportation costs would be $50 per trip.

Unit-of-output depreciation: A method of depreciation in which the capital cost of an item is allocated according to its use as measured by output. For example, automobiles are often assumed to have a useful life of so many miles of performance rather than so many years. The capital cost is then allocated to an accounting period according to the ratio of miles driven during the period to the total miles of useful life. Many other types of equipment are similarly depreciated by "hours of operation."

Variable cost: Beyond fixed costs, certain costs vary with the level of output produced or services provided. For example, each additional client in a halfway house will incur a "variable cost," that is, those costs that would not be incurred if the client were not admitted to the halfway house.

Workload measures: The amount of effort that resources have to expend to complete a task or activity is measured as the workload. For example, the time it takes to complete a presentence investigation is a workload measure for probation officers.

References

Chabotar, K.J. 1982. *Measuring the Costs of Police Services.* Washington, D.C.: U.S. Department of Justice, National Institute of Justice.

Fisher, G. 1971. *Cost Considerations in Systems Analysis.* New York: Elsevier.

Fitzharris, T.L. 1979. *Probation in an Era of Diminishing Resources.* Sacramento, California: Foundation for Continuing Education in Corrections.

Harlow, N. and Nelson, E.K. 1982. *Management Strategies for Probation in an Era of Limits.* Washington, D.C.: U.S. Department of Justice, National Institute of Justice.

Horngren, C. T. *Cost Accounting.* Englewood Cliffs, N.J.: Prentice Hall.

Kelley, J. T. 1984. *Costing Government Services: A Guide for Decision Making.* Washington, D.C.: Government Finance Officers Association.

Miron, H. J., et al. 1979. *Managing the Pressures of Inflation in Criminal Justice.* Washington, D.C.: University Research Corporation.

Wayson, B. L., Falkin, G., and Cruz, M. T. 1981. *Users Manual for Estimating Standards Compliance Costs.* U.S. Department of Justice, LEAA.

Wayson, B. L., Funke, G. S., and Falkin, G. 1984. *Managing Correctional Resources: Economic Analysis Techniques.* U.S. Department of Justice, National Institute of Justice.

APPENDIX

Sample log

INSTRUCTIONS FOR COMPLETING DAILY LOG

A. SUMMARY OF DAILY ACTIVITY - (ALL ATTORNEYS)

The purpose of this entry is to record how an attorney's time is distributed over a working day. Because an attorney's working day may vary drastically depending on trial status, compensatory time or leave, total time should reflect these conditions.

1. Time worked on specific criminal cases is a priority item in this study. If attorney effort can be attributed directly to a criminal case number, then it should be recorded on the log below and totalled here.
2. Time worked on criminal matters not case-specific includes all of the attorney time related to criminal prosecutions which cannot be linked to a specific case. It includes such simple things as cleaning off your desk and filing papers, preparing for other activities, reading journals or materials, talking to colleagues, training, and administering small organizational units.
3. Time spent on office administrative duties will apply to only a few attorneys since this category relates to activities that are office-wide such as office administration, management, policy, personnel, records, budgeting, and planning.
4. Any time spent on noncriminal matters should be recorded in this category. This includes such areas as child support enforcement, civil matters and appeals.

B. LOG FOR CRIMINAL CASE TIME - (ATTORNEYS WITH CRIMINAL CASELOAD)

Effort should be recorded each time it can be identified with a criminal case number (or numbers if cases are joined). One may think of this as being analogous to a private attorney's billing his or her time to a client. This time should be classified by whether the activity occurred out of court or in court.

Each in-court activity should identify the type of court appearance and its result.

1. "Hearing completed" means that the scheduled court appearance was completed and the case is scheduled for the next process step.
2. "Case disposed" means that the case has been adjudicated by plea, conviction, acquittal, or dismissal. It also is used to show that sentencing has occured.
3. "Case continued" occurs when the scheduled hearing for this case is not reached or concluded and a new appearance is set. If the case is continued for a plea or other disposition then this is separately identified.

C. Indicate whether the case is a felony or misdemeanor in the column labelled "F/M".

D. Space has been provided for comments.

E. Continuation sheets have been provided if more space is needed for the activities on that date. Use the activity codes from the cover sheet.

OFFICE OF THE COMMONWEALTH ATTORNEY
ALEXANDRIA, VIRGINIA
DAILY LOG FOR CRIMINAL CASE TIME

_____ TOTAL TIME WORKED (Hrs:Min)
_____ 1. on specific crim. case (from log)
_____ 2. on crim. case matters not case-specific
_____ 3. on office administrative duties
_____ 4. on non-criminal matters
(See reverse for instructions)

Date: _____
Attorney: _____
Unit Assigned: _____

ACTIVITY CODES FOR FELONY (F) OR MISDEMEANOR (M)

Out of Court Activity:	In Court (include waiting time): Activity	Result
1. Intake, Charging	11. D.Ct. - NC and/or SD	A. Hearing completed, go to next step
2. Conferences, Negotiation, Meeting	12. Preliminary Hearing	B. Case Disposed
3. Preparation for Court Appearance or Trial	13. Grand Jury	C. Continued, not reached
4. Case File Documentation	14. C.Ct. - NC and/or SD	D. Continued for Disposition
5. Preparation for Sentencing or Presentence	15. Motions	E. Continued, other
6. Post Sentencing Procedures	16. Trials	F. Failure to Appear
	17. Disposition	
	18. Sentencing	
	19. Postconvict Revs./Misc.	

File Number	F/M	Defendant's Name	Act. Code	Rslt. Code	Hrs:Min	Notes or Remarks
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