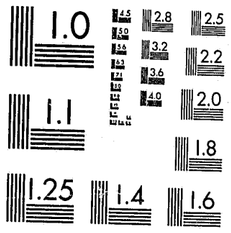
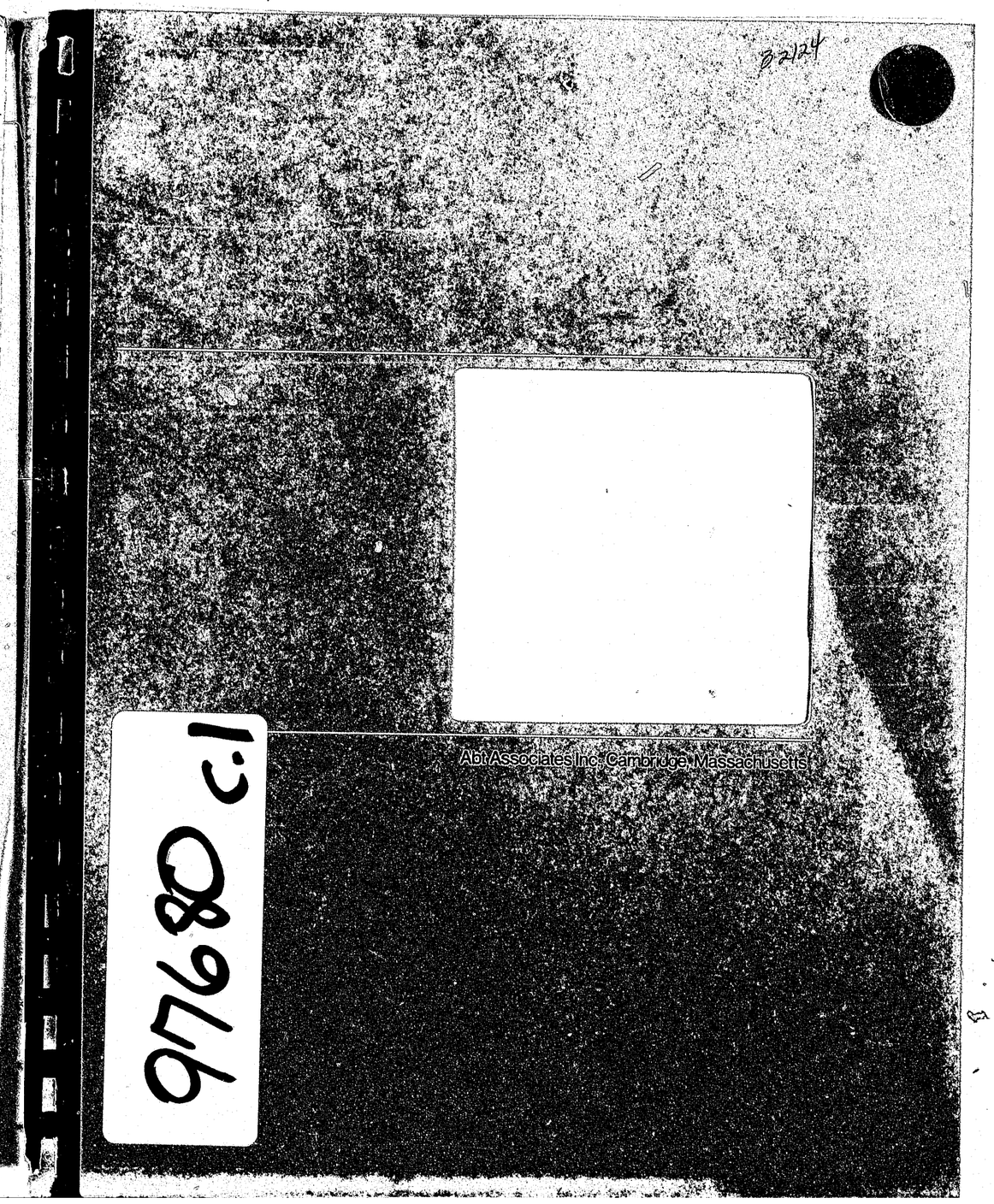




97680

Abt Associates Inc.
55 Wheeler Street, Cambridge, Massachusetts 02138
Telephone • Area 617-492-7100
TWX: 710-3201382

SHARING POLICE SUPPORT SERVICES:
A FOCUS ON COMMUNICATIONS

by

Kent John Chabotar
Lindsey D. Stellwagen

with the assistance of
Naomi Goldstein

August, 1983

Contract Manager	Quality Control Reviewer	Management Reviewer
Deborah Cravens	Deborah Cravens	Deborah Cravens

SHARING POLICE SUPPORT SERVICES: A FOCUS ON COMMUNICATIONS

by

Kent John Chabotar
Lindsey D. Stellwagen

with the assistance of

Naomi Goldstein

Prepared for the National Institute of Justice, U.S. Department of Justice by Abt Associates Inc., under contract number J-LEAA-013-78. Points of view or opinions stated in this document are those of the authors and do not necessarily represent the official position or policies of the U.S. Department of Justice.

August, 1983

U.S. Department of Justice
National Institute of Justice
Office of Development, Testing, and Dissemination

Issues and Practices Documents are a synthesis of research and evaluation findings, operational experience, and expert opinion in a criminal justice topic area. Each report presents a series of programmatic options and analyzes the advantages and disadvantages of each. The intent is to provide criminal justice administrators with the capability to make informed choices in planning, implementing, and improving efforts in a program area. The Documents may also serve as the basis for training, testing, and demonstration efforts.

The following individuals provided information and assistance in the conduct of this study.

Advisory Panel

Mr. Roger B. Parks
Workshop in Political Theory
Indiana University
Bloomington, Indiana

Chief Darrel W. Stephens
Newport News Police Department
Newport News, Virginia

Mr. James G. Vetter
Colorado Springs Police
Department
Colorado Springs, Colorado

Program Monitors

Mr. James Gardner
Ms. Carol Dorsey
National Institute of Justice
Washington, D.C.

Table of Contents

Table of Contents

continued

List of Exhibits

List of Exhibits

continued

List of Exhibits

continued

ACKNOWLEDGEMENTS

A number of individuals and organizations assisted in the development of this Issues and Practices Document. State Planning Agencies and local police departments across the country responded to a telephone survey and provided valuable data about their service sharing arrangements, and their assistance is sincerely acknowledged. Field visits were made to study existing communications sharing arrangements in Forest Hills, Pennsylvania; Sumter, South Carolina; the Northwest Central Dispatch System in Arlington Heights, Illinois; and the South Bay Regional Public Communications Authority in Hawthorne, California. Thanks are given to the managers and staff of these sharing arrangements and to officials of member jurisdictions for the information and insights they provided.

Special appreciation is extended to Mr. Roger Parks of Indiana University; Chief Darrel Stephens of the Newport News Police Department; and Mr. James Vetter of the Colorado Division of Criminal Justice. As members of the Advisory Panel, they contributed their understanding and experience throughout the development of this document.

Within Abt Associates, thanks are especially due to Bob Peterson, who originated this project and conducted much of the literature review and telephone survey on which this document is based; to Naomi Goldstein, who drafted the chapter on operating a service sharing arrangement; to Deborah Carrow for reviewing and thereby improving successive drafts of this document; and to Susan Nyman, Barbara Quinlan, and Deborah Welch for their expert typing and administrative help.

Finally, the authors gratefully acknowledge Mr. Jim Gardner and Ms. Carol Dorsey who have successively served as Program Monitors for the Model Program Development Division, Office of Development, Testing and Dissemination, National Institute of Justice. This document could not have been developed without their moral and technical support and professional judgment.

Kent John Chabotar
Lindsey D. Stellwagen

Cambridge, Massachusetts
August, 1983

PREFACE

A growing number of public officials are realizing that just as crime crosses jurisdictional lines, so too must crime control approaches and technologies. Many acknowledge that the problems are too large and the costs too great for any one local government to handle alone. Some departments are attempting to upgrade their patrol and investigations capabilities by sharing not only information but also equipment and services with other jurisdictions. Such intergovernmental cooperation is one way that criminal justice agencies are confronting both crime and the fiscal crisis that is upon them.

Police departments and other criminal justice agencies are beset with increasingly severe budget cutbacks and are feeling the inflationary squeeze of rising salaries and equipment costs. Even wealthy departments are finding that the once sacrosanct police budget has become no more than another item in the city or county budget. While police expenses are as subject to high inflation as welfare, education, and other social services, these other areas are more heavily subsidized by state and federal governments. In contrast, police services are almost totally financed by local taxes. When local cutbacks occur, the police are one of the first to feel that financial squeeze.

In addition, police personnel expenditures have been rising. Since the late 1950s, public employee unions have become increasingly successful in obtaining dramatic salary increases. Fringe benefits and retirement programs have also been improved, further adding to personnel expenditures by another 40 to 60 percent. A comparison of total police budgets of seven major cities for fiscal years 1970 and 1977 shows aggregate increases ranging from 150 to 270 percent with an average of over 200 percent for the eight year period.*

Although police services, in general, are highly labor intensive, several support functions require expensive technologies. In order to provide coverage for broad geographic areas, modern radio communications require satellite receivers and repeating transmitters. Automated record systems are used to issue warrants and notify witnesses of scheduled court appearances. Computers provide almost instantaneous criminal history checks of suspicious

*Michael S. Serrill, "Urban Crisis Makes Police Vulnerable--and Angry," Police Magazine (Prototype Issue), p. 4.

persons and select the patrol car which can most quickly respond to a call for service. Many police agencies, especially small departments,* find it impossible to purchase the equipment necessary to achieve and maintain state-of-the-art technology.

Ironically, as police resources have decreased, public demands for police protection have increased. This conflict clearly presents itself in the area of support services since these services are usually cut back first. Increasingly, departments are being forced to deal with difficult issues involving support activities, e.g.,:

- An officer is killed when his request for help is jammed due to radio channel congestion;
- A small police agency is forced to use a 24-hour gas station to provide night dispatch;
- A routine records check fails to reveal an outstanding warrant on a traffic stop, and the driver is permitted to leave;
- The sheriff's department needs to upgrade its communications facility, but the County Commissioners cannot find the funds to finance the project;
- A police department uses only informal training for dispatch; as a result, the dispatcher delays in sending out a unit on an in-progress burglary call and the caller is killed.

Service problems such as these are often insurmountable for a single department because it simply cannot afford to upgrade these services. In fact, some departments are coping with their fiscal crisis by dismissing staff, deferring maintenance, and reducing the support services needed for the efficiency of police work and the protection of lives. However, as mentioned previously, many departments are discovering that a more effective way to conserve scarce resources, and still sustain critical support services, is to share resources and services with other departments.

Sharing Police Support Services: A Focus on Communications is intended to address the cooperative provision of police support services as a viable method of upgrading service and reducing costs. By sharing those police functions that are intended to assist in the provision of the direct police services of patrol and investigation, reduction in personnel and

*National Association of Counties Research Foundation, County-Wide Law Enforcement: A Report on a Survey of Central Police Services in 97 Urban Counties, by S. Anthony McCann (Washington, D.C., 1975).

equipment costs can be realized without compromising the autonomy of individual police agencies.

Communications has been chosen as a focus for this report because of all support services it is perhaps most critical to the effective functioning of police agencies. Almost all public requests for assistance are made by telephone to the communications center. In addition, police agencies themselves rely on the communications center as a crucial link between officers in the field and police headquarters. Radio communications and dispatch are therefore essential for agency operation. Moreover, communications is certainly the service which consumes the bulk of resources devoted to support activities. Most importantly for the purposes of this document, the steps involved in implementing a shared communications system apply equally well to the sharing of other support services.

This report relies on information from six major data collection efforts.

1. An extensive literature review was conducted, including an examination of feasibility and technical assistance reports, descriptions of arrangements for the cooperative provision of support services, and general discussions of the nature of cooperative endeavors;

2. Discussions with experts in the field were used to update the literature review with unpublished documents, which provided examples of both recently developed sharing arrangements and current thinking on the topic;

3. A telephone survey of law enforcement specialists in the 50 LEAA State Planning Agencies provided the names of all jurisdictions within each state participating in a shared support service arrangement, as well as names of specific contact persons in these departments;

4. A telephone survey of over 200 police agencies participating in support service sharing arrangements provided information on initiation, implementation, and operation of shared services across six service types--communications, records and data processing, equipment and facilities, crime laboratories, training and selection, and detention facilities;

5. Discussions with an advisory panel were used to verify the apparent success of various systems, and offer suggestions on the contents of the report; and

6. Site visits to four successful cooperative systems produced detailed information from each site on all aspects of their experience with shared communications.

Based on these data sources, this report presents practical techniques for establishing and operating an inter-jurisdictional police communications system. The recommendations made in this document take into account the diversity of department size, geographical configuration, and jurisdictional patterns as well as varying levels of knowledge, skills, and equipment. The basic thrust of these techniques is to assist police departments in upgrading their communications systems and/or reducing system costs.

Thus, this report should serve these purposes:

- To assess the feasibility of establishing a cooperative communications system;
- To promote awareness of potential benefits arising from shared communications;
- To provide a simple method of determining department service and organization needs;
- To present a practical plan for implementing the system which can be tailored to individual requirements;
- To offer a straightforward method for measuring the full cost and value per dollar, both personnel and non-personnel, of cooperative service; and
- To improve the role of communications in the provision of direct police services.

To achieve these aims, this report details the steps involved in developing a shared communications system. Chapter 1 begins with a general introduction to the purposes and methods of sharing communications, and is followed by several chapters which provide specific guidance on how to install a cooperative system: Chapter 2 (Planning for Support Service Sharing), Chapter 3 (Organizing a Service Sharing Arrangement), Chapter 4 (Managing Personnel Resources), Chapter 5 (Managing Financial Resources), and Chapter 6 (Operating a Service Sharing Arrangement). Each chapter not only describes the most common techniques for designing and implementing shared police communications but also reviews the typical problems at each stage of system development and methods that existing systems have used to overcome them.

Chapter 7 (Evaluating a Service Sharing Arrangement) argues for evaluation of the shared service. The double-edged approach of process and impact evaluation leads into a discussion of how to set system objectives, choose evaluation instruments and data collection strategies, and determine the extent to which the objectives have been met. Chapter 8 (Considering Other Service Sharing Arrangements) discusses other support services which are

appropriate for sharing in the manner prescribed for communications: data processing and records, training, equipment and facilities, crime laboratory, and detention facilities. Special considerations for each service are presented in this chapter as well as solutions to potential pitfalls. Finally, the Appendices contain examples and worksheets to be used in conjunction with Chapters 2 through 8.

The principles and procedures contained in these chapters are intended for use in state, county, and municipal public safety agencies. Police chiefs, fire chiefs, sheriffs, and other top managers should be especially concerned with the policy level information about planning and organizing a communications sharing arrangement presented in Chapters 2 and 3. These same chapters will also assist city managers, mayors, and legislators who are potentially or actually involved in a sharing arrangement so that they can more effectively participate with their jurisdiction's public safety specialists in the system's design and implementation.

Operating managers such as precinct and troop commanders in jurisdictions contemplating or implementing a shared dispatch system are directed to the administrative level information in Chapters 4 and 5 on system management and in Chapter 6 on system operations. Managers of existing shared dispatch systems will also find Chapters 4 through 6 particularly helpful. Chapter 7 is relevant to almost all potential readers of this document since the issue of whether or not the communications system was a success should be a general concern and its evaluation a common practice. Most readers will also be interested in Chapter 8 since communications may be but one of the services that a jurisdiction will want to share in order to reduce costs and improve service.

Chapter 1

INTRODUCTION

- An armed robbery occurs in Wilton Manors, Florida. A description of the escape vehicle is put out on an all-channel broadcast. Cruisers from three cities give chase, roadblocks are formed, and the suspects are apprehended. Every day the Cooperative Dispatch Center #2 in Broward County, Florida helps the four member police departments stop interjurisdictional crime. The sophisticated communications center is a joint powers system which employs nearly fifty-five persons. Operational since 1974, its members agree it is an unqualified success.*

- Communities in New Jersey's "Lakeland Region" were plagued by fractionalized communications service. Police agencies depended upon dispatch from distant law enforcement agencies, sometimes provided only on an emergency basis. Fire and rescue dispatch was divided among distant agencies, an airport, a service station, and private homes. In response the communities established the Sussex-Morris Regional Police Communications Network, a joint powers system providing communications for police departments, fire departments, emergency squads, and road departments. The members share equally all basic costs, such as rent, and are charged for operational costs by a population and workload formula.**

- A silent alarm is received, and the Genesee County Consolidated Communications Center transmits the call. An officer writing a ticket across the street from the establishment verifies the robbery. The Center puts out a message for assistance; the suspects take hostages. Within two minutes of the original call, more than ten units from different agencies arrive on the scene. The area is sealed off by thirty units and the suspects give up. The twenty-five law enforcement agencies in Genesee County, Michigan are more than satisfied with their joint powers communications center. As one Chief of Police noted, under the old system a city crime could occur near a county cruiser, and the deputy would not even know about it because he had been on a different frequency.***

- In Sumter, South Carolina the city police headquarters was located in an opera house which was condemned; the County Sheriff headquarters was in the basement of the courthouse. Both agencies needed new quarters and decided jointly they could afford a new Law Enforcement Center and a new communications system. The city police department supplies the county with communications and they share the costs equally. Both agencies now agree that they would not be satisfied with any other arrangement.

---

*Bruce Leberman, "Cooperative Dispatching Catches Bad Guys for South Florida Police," The Police Chief (October 1976), p. 52.

**Eskil Danielson, "Regionalized Police Communications: Economical, Efficient and Effective," Law & Order (February 1979), p. 51.

***R.A. Page, "How 21 Police Agencies Co-operate with Total Communications," Law & Order (February 1975), p. 33.

These four systems are actual examples of shared communications systems which have been in existence for several years. The examples illustrate how sharing allows members to enhance their direct services by increasing arrest rates, reducing response time, and maximizing public safety. Although each shared communications system is organized differently to meet the individual needs of its members, these systems typify efforts nationwide to organize and operate shared dispatch service, and gain the benefits of sharing.

For the purposes of this report, police communications includes the two major systems necessary for command and control: dispatch and radio communications. While the former provides the linkage between the public and direct police services, the latter allows intra-agency communication both unit-to-unit and base-to-unit. This first chapter addresses issues pertaining to both of these systems. After exploring the pressures which lead agencies to consider sharing communications, the chapter turns to an overview of currently operating shared systems based on the available literature and a national telephone survey. Final sections explore the problems and limitations faced by members of a shared communications system and summarize the steps involved in system development and implementation.

1.1 Pressures Leading to Support Service Sharing

Law enforcement today must strive to meet the challenges presented by a rapidly changing society. As urban and suburban centers spread into surrounding rural areas, the boundaries between city and county functions are becoming less distinct. The increased mobility of the population has resulted in increased rural and interjurisdictional crime. The economic climate of the nation demands efficient use of resources while the public concern about rising crime rates requires more effective law enforcement efforts. These general conditions then lead to specific pressures on law enforcement communications systems. Agencies must:

- conserve scarce resources by becoming more cost-efficient;
- discover means to overcome the channel congestion characteristic of densely populated areas;
- become more effective through improved training and staff selection; and
- coordinate communications for effective law enforcement.

In many cases, these are needs that law enforcement agencies can no longer afford to ignore, and many are now considering restructuring their traditional

methods of delivering services such as communications. The sections below examine the pressures for communications sharing in greater detail.

1.1.1 Cost Efficiencies

Communications is a costly support service, involving substantial investments for both personnel and equipment. Even the most minimal provision of 24-hour dispatch--one person on duty at all times--requires between four and five full-time personnel, while more advanced dispatch systems may require much higher staffing levels. Similarly, modern communications equipment such as universal emergency telephone numbers, portable transceivers, digital communications, and access to local, state, and federal criminal justice information systems will require considerable expenditures. For example, an Emergency Command and Control Communications System contemplated in 1973 by the Los Angeles Police Department was expected to require an investment of $58 million over a four year period.*

While 24-hour dispatch is essential to the operation of small and large departments alike, smaller departments often find that (1) four to five staff members may be an excessive and unaffordable commitment of resources, or (2) the relatively low volume of calls handled by the smaller department over the 24-hour day leaves dispatchers idle much of the time, resulting in manpower inefficiencies. Shared communications systems provide a ready solution to both these dilemmas. Because personnel costs are allocated among several departments, each agency is able to afford the staff commitment; the increased volume of work for the dispatch staff also results in more efficient use of communications personnel. The importance of this saving was illustrated by the respondents in our telephone survey: seven out of eleven departments sharing communications identified reduced personnel costs as a major motivation for participating in the shared communications system.

Equipment costs are similarly reduced under cooperative communications arrangements. Through the combined contributions of member departments, equipment formerly unavailable to agencies due to prohibitive costs becomes easily affordable. Again, respondents in our telephone survey and onsite

*Los Angeles Police Department, "LAPD and Computers, 1972-1973," (Unpublished, Los Angeles, California, 1973).

study enthusiastically endorsed this advantage: departments in the Bergen County, New Jersey; Cook County, Illinois; and Snohomish County, Washington areas each noted that cooperative dispatch allowed them access to advanced technology which they would otherwise have been unable to afford.

1.1.2 Reduced Channel Congestion

As a result of the rapid proliferation of police communications equipment, channel availability has become a major concern for some police agencies, especially in metropolitan areas. One of the first responses to this problem was the development of technical devices to restrict the range of communications equipment. In some areas this equipment has reduced the congestion problem; in other areas, however, its effectiveness is severely limited. A second approach was taken by the Federal Communications Commission which has developed rules for the assignment of frequencies that are designed to protect channel integrity. But despite these rules and the careful assignment procedures of some regional groups, frequencies often are inadequately separated for clear and distinct message transmission. In addition, strict adherence to these rules in some crowded areas would restrict frequency availability to such an extent that some eligible agencies would be unable to obtain any frequencies at all.* Finally, even where it is possible to maintain adequately separated communication channels, demands for radio communications access may force the assignment of more than the recommended maximum of 30 to 35 police units to a single channel. Under this situation, the system becomes "communications limited"** in that certain lengthy messages such as all-points bulletins and vehicle or person checks must wait while shorter messages are broadcast. In addition, calls-for-service are delayed pending a break in the on-going communications traffic. These delays decrease overall efficiency and tend most often to occur when the number of situations requiring immediate attention is also high.

Coordinated dispatch efforts address this congestion problem in two ways. First, with the shared use of multiple frequencies, the excessive

*Connecticut Justice Commission, Connecticut Law Enforcement Communications: A Radio Network Plan, by John McDonnell and Elliot Silverstein (Cambridge, Massachusetts: Abt Associates Inc., 1977).

**California Council on Criminal Justice, Feasibility of a Coordinated Records and Communications System for Region XI (San Jose, California: Public Systems Incorporated and Institute for Police Studies, June 1971), p. 3-5.

communications traffic of one channel can be reassigned to a less busy frequency. Secondly, to the extent that cooperative communications systems are able to provide the speed of advanced digital communication technology, additional air time can be saved, thus further alleviating channel congestion.

Reductions in channel congestion and transmission noise were reported by respondents participating in shared communications systems in both the telephone survey and field interviews. The specific benefits resulting from reduced congestion are illustrated most clearly in one situation described by respondents from Cook County, Illinois. Several years ago, radio calls for assistance from a police officer were unheard due to crowded and noisy channels. Unable to obtain assistance, the officer was subsequently abducted at gun point and murdered. This situation accelerated the development of a shared communications system. More recently, in contrast to the earlier incident, the communications system successfully directed the area's response to an airplane crash. Through the increased capacity of the new system, the area could handle the necessary volume of communications without the problems of channel congestion or lost transmission that had previously blocked a solitary call for help.

Shared police communications offers yet another means of reducing channel congestion by providing access to digital communications. Member departments may either share the digital communications equipment of a supplier or may apply the cost savings resulting from the arrangement to the purchase of the necessary digital equipment. Although this technology is expensive, transmissions via this medium are so much faster than voice communications, in terms of actual air time required to send the same voice message, that channel frequencies are cleared more rapidly and the number of frequencies needed is reduced. For example, in projecting ten-year communications needs, the Los Angeles Police Department estimated that digital technology could reduce its required number of frequencies 75 percent (from twenty to five).*

1.1.3 Personnel Quality

Effective use of modern communications technology demands special technical training for communications personnel. Because recruit training

*Los Angeles Police Department, "LAPD and Computers, 1972-1973."

normally provides little more than a general overview of the use of advanced communications equipment, it remains for the communications facility to supply the necessary training. However, technical expertise alone may be insufficient: communications personnel, especially dispatchers, must bring a basic understanding of the police function to their profession. As the Director of the Communications and Information Unit of a northeastern sheriff's office argues:

> Street experience is invaluable in understanding the needs of the man in the car--to provide as much pertinent information as possible, or to position cars properly. They are no longer dispatchers, they are controllers. Taxicabs and cement trucks are dispatched, but police cars are controlled. The knowledge of an area, the positioning of a car, knowing a law before a car is sent, the knowledge of the use of the radio equipment all require professional communicators who know their business.*

Recruiting, training, and maintaining a high quality communications staff is an expensive and time-consuming effort for any organization. All too often, single departments, faced with competing demands on staff time, are unable to focus on the development of their communications staff. Cooperative communications systems, on the other hand, have the necessary resources to devote to staff development and training through the combined financial contributions of member departments. Thus, the communications supplier can afford to invest in activities which ensure high quality staff: screening, training, and provision of salary and benefit incentives to attract experienced and qualified staff. In addition, supplier agencies have substantial incentive to devote attention to these activities: the supplier's continued funding depends on the consumer agencies, who may withdraw from the arrangement if its services and personnel are not of high calibre.

Numerous examples of shared communications systems' advanced staff development activities are available. In the area of training, for example, the Muskegon Central Dispatch system sends staff to orientation meetings, periodic training courses, and refresher courses.** Results of our telephone survey indicated that even small cooperative systems such as those of

*Charles E. Gabriel, "Onondaga County Police Agencies Make Mobile Radio District Idea Work," Law and Order (February, 1975), p. 50.

**National Institute of Law Enforcement and Criminal Justice, U.S. Department of Justice, An Exemplary Project: Central Police Dispatch, by John J. McDonnell (Washington, D.C.: U.S. Government Printing Office).

Washington County, Maryland and Ottawa County, Kansas are able to provide formal in-house training of seven to eight days.

Suppliers may also be able to combine these approaches, resulting in even greater benefits in terms of staff development. For example, a respondent in our telephone survey praised the upgraded training and salary levels attributed to its cooperative dispatch arrangement. A department participating in the Sumter County, South Carolina cooperative communications system also reported favorable results from careful screening of applicants followed by training at a criminal justice academy.

1.1.4 Improved Cooperation and Coordination

Cooperative dispatching also offers the benefits of increased coordination, cooperation, and information sharing. Roadblocks and stake-outs may be more effectively and efficiently conducted* and back-up forces can be coordinated and made available. One of law enforcement's perennial problems is that its activities are compartmentalized into jurisdictions, but criminal events are not. Interjurisdictional communications helps to combat this problem.

> The East Syracuse car responded to a burglary in progress call at a tavern, and before he left his car to investigate he radioed us for a backup unit. The East Syracuse Department had only one car in service, so we dispatched two Sheriff's cars, positioning them on the far side of a field adjacent to the tavern. When the East Syracuse patrolman observed two men running out the door in the back of the building, he called in that information on his portable radio. Within a minute or two, the burglars ran directly into the arms of the Deputies, who were waiting on the other side of the field. Because of central communications, the controllers were able to respond to the request for the backup cars--even though the East Syracuse Department had only one--and position them. In fact, we've never before concluded as many felony-in-progress calls as we have since this system went on the air.**

*Kelly Scientific Corporation, Present Status and Resources of Police Mobile Communications in the State of New York (Washington, D.C., 1969).

**Gabriel, "Onondaga County Police Agencies Make Mobile Radio District Idea Work," p. 45.

Improved coordination through shared communications has also been noted in San Diego, California,* the San Antonio, Texas area,** and Allegheny County, Pennsylvania*** as well as in a state-wide survey of New York.**** In addition, this benefit was frequently noted by respondents in our telephone survey and on site visits.

1.2 Overview of Current Sharing Arrangements

Although communities face similar pressures for communications system sharing, the systems adopted in response to these pressures may differ widely. In general, however, shared communications tend to assume one of two general formats:

- Police Agency Supplier: in which primary responsibility for communication is placed with one law enforcement agency and surrounding communities contract with that agency for communications services; or
- Joint Provision: in which an independent central agency for police communications is developed and jointly supported by participating police departments.

Each of these configurations appeared consistently in the telephone survey which covered the six basic types of support services. As represented in the communications component of the survey and site research, the two formats possess certain characteristics important to sharing communications. These characteristics are individually examined below.

*California Council on Criminal Justice, Feasibility of a Coordinated Records and Communications System for Region XI.

**Gary Miller, "The Universal City Joint Dispatching System," Police Services Study Fact Sheet, F-7 (Bloomington, Indiana: Indiana University, Workshop in Political Theory and Policy Analysis).

***Jacqueline Cohen, Michael Lettre and Richard Stafford, Analysis of the Allegheny County Criminal Justice System--Present Operations and Alternative Programs (Pittsburgh, Pennsylvania: Carnegie-Mellon University, 1972).

****Kelly Scientific Corporation, Present Status and Resources of Police Mobile Communications in the State of New York.

1.2.1 The Police Agency Supplier

Arrangements in which a police agency performs the role of supplier may be developed on either an informal or contractual basis. Overall, the most common format is an informal agreement in which one law enforcement agency (often the county sheriff) agrees to dispatch for one or more municipal departments on a part-time basis, often after hours.* Forty percent of the respondents to the communications component of the telephone survey participated in a shared system where the county provides dispatch services for local agencies (Erie County, New York; Williamson County, Texas; Boone County, Kentucky; and Ottawa County, Kansas). Although some consumers provided their own dispatch services during the day, other consumers in each of these surveyed arrangements relied totally on the county for dispatching. In most cases the service was cost free, although in Ottawa County, Kansas the city contributes the salary of one dispatcher.

However, the survey and the literature suggest that financial pressures on suppliers, plus the legal and administrative problems they have encountered, have led many to abandon informal arrangements and to adopt a contractual arrangement involving a fee for service. A contract is a document which contains the promise of the supplier agency to provide the service and the promises of the consumers to pay for the services provided. It is usually signed by a government official and the agency administrator of both the supplier and consumer, and is legally binding on both parties: for example, if the supplier fails to provide the agreed upon service, the consumers can go to court to force the supplier to provide the service or to obtain monetary compensation. Similarly, the suppliers can enforce the contract against consumers.

Contractual sharing is often characterized by the existence of a dominant agency surrounded by smaller agencies. The dominant agency in rural areas will generally be the only department with sufficient personnel and adequate facilities to provide 24-hour dispatch coverage. Yet, even

*Elinor Ostrom, Roger B. Parks, and Gordon P. Whitaker, Patterns of Metropolitan Policing (Cambridge, Massachusetts: Ballinger Publishing Company).

where all members can provide their own communications, the largest department is still the obvious choice due to its greater resources. Structural changes required for sharing are relatively minor: the supplier simply absorbs the additional work within its preexisting structure, thereby allowing the community to avoid the costs, logistical difficulties, lengthy negotiations, and legal issues involved in establishing a new communications facility. In addition, because it uses an established facility, this arrangement offers a ready source of skilled personnel and comparatively short implementation period. Even where the increased workload of the shared system necessitates expansion of the supplier's facilities, equipment, and staff, implementation is easier than the creation of a new, jointly-operated entity.

The telephone survey demonstrated that the degree of trust between supplier and consumers is an important determinant of consumer satisfaction with the sharing arrangement. In about 50 percent of the contractual arrangements surveyed, consumers based their satisfaction with the communications system largely on their confidence in the supplier's capacity to operate an efficient and effective shared dispatch arrangement and thus relieve them of the burden of dispatching police on their own. On the other hand, where consumers had some reasons to doubt the supplier's capacity or responsiveness to local needs, and could not influence system planning or operations, disagreements arose and satisfaction declined.

1.2.2 Joint Provision

In areas where there is no single obvious candidate for the role of supplier, and where there are multiple agencies producing their own communications services, the joint provision of dispatch services through an independent communications center is more likely to occur. The legal basis of an independent communications center is a document called a "joint powers agreement" (sometimes referred to as an "inter-local agreement"). Like the agency supplier contract, a joint powers agreement contains the responsibilities and obligations of each member, is legally binding on all members, and is signed by member departments and local government officials. However, a joint powers agreement goes further in that the members create a new entity by jointly exercising their individual powers to provide communications. The

new entity is given powers to hire employees, incur debts, acquire property, and so forth in order to operate the new center.

Metropolitan suburban areas, due to similar demographics and resources, are usually most receptive to joint provision. The existence of many communities in such a limited geographical area not only makes channel congestion an impetus for communications sharing, but also allows physical proximity to facilitate the sharing arrangement. In addition, the economic and social composition of neighboring suburban communities are often very similar, as exemplified by the suburban sprawl in many areas of the country. This similarity is reflected in the local police departments, which tend to operate in substantially the same way, handle the same types of crime, and address the same service quality demands of their residents. These conditions make it easier for departments to cooperate jointly. In contrast, if metropolitan and suburban departments tried to develop a joint powers sharing arrangement, the divergence of service needs, resources, and overall operations might make it difficult to agree on unified procedures and call priorities. Finally, because neighboring suburban communities tend to be the same size, it is unlikely that one department would have the excess capacity to function as a supplier; therefore, selection of one to serve as supplier might appear arbitrary and could give rise to interjurisdictional conflicts. For these reasons, joint powers arrangements work well in suburban communities. It should be noted, however, that joint provision of communications services is not exclusively a suburban phenomenon. Many of the demographic and economic factors that facilitate suburban joint dispatch systems are also found in urban and rural areas and have led to successful sharing arrangements in these areas as well.

A joint communications center is usually established not at the invocation of a single agency, but by the joint initiative of all member agencies. This arrangement involves a more complex implementation procedure than the police agency supplier configuration: suitable facilities must be located and acquired; central communications equipment must be purchased or obtained from member departments; staff must be hired or drawn from the communications centers of participating agencies; and the legal and management issues must be clarified.

In return for this increased investment in implementation time and resources, the members of the jointly provided communications center find they receive a number of advantages. Because the independent supplier concentrates on the provision of communications services alone, staff are devoted exclusively to communications activities. This in turn may lead to greater staff expertise and increased opportunity for staff development and training. Another advantage is the communications center's access to improved technology. For instance, if each of four agencies could purchase a $5,000 computer terminal, pooling their money would enable them to purchase one $20,000 model which is far more sophisticated and could still handle the workload of all four members. By joining their purchasing power, members thus receive greater value per dollar spent. Finally, opportunities for interjurisdictional disagreements are minimized under this arrangement, as the communications center is not controlled by a single department.

Management of the joint communications center is most often the combined responsibility of all member departments. This is accomplished by means of governing boards, composed of representatives of each member agency. In general, local government officials serve on a policy board, while law enforcement representatives serve on an operational board. This equal voice concept is a key feature of successful joint communications systems and is discussed in Chapter 3.

1.3 Existing Problems and Limitations

Whether the shared communications system is operated on the single supplier model or through joint provision, research and practice have identified three major pitfalls which may threaten the system's establishment or survival: system control, service capacity, and the use of civilian dispatchers. This section examines the ways in which each of these pitfalls can impair communications sharing. Possible solutions are presented in the chapters that follow.

1.3.1 Control

While the issue of local control is often raised in conjunction with sharing all support services, it is particularly problematic in sharing communications. This is because communications is so closely allied with the

patrol function that many law enforcement agencies equate sharing communications with loss of control over their field officers. In its study of police services in Dade County, the International Association of Chiefs of Police commented:

> Each system maintains its own service facilities . . . and its own complaint dispatching staff. Each system is looked upon . . . as an important part of the department's operations, and a function which cannot be assigned to another agency without serious loss of supervision and control.*

To some departments the fear of lost control is so great they resist sharing despite potentially substantial cost savings.** Even where sharing has proven successful, control continues to be an important issue. Loss of control over dispatcher personnel and procedures was the second most frequently cited disadvantage of shared communications in our communications survey sample. This difficulty has been most successfully addressed by jointly operated communications services in which the governing body affords the opportunity for participatory decision making and allows each department to retain an individual voice in setting policy, instituting procedures, and monitoring operations. It remains clear that the departments are, collectively, providing the service, and not simply buying a predetermined communications package from an outside source. Contractual arrangements with a police agency supplier do not appear to be as amenable to participatory management, and may therefore be more subject to dispute over issues of control.

1.3.2 Capacity

Once agencies decide to share communications, the success of the system is heavily dependent on the quality of service provided. The most frequent complaint recorded in the telephone survey was that demand exceeded the capacity, or that the system was understaffed. This situation may arise, for example, when a successful campaign to obtain new consumer departments creates an unanticipated need for new equipment and systems to cover larger

---

*President's Commission on Law Enforcement and Administration of Justice, Task Force Report: The Police, p. 87.

**B.L. Garmire, Fuguay-Varina (NC)--Police Department--Organization and Management Study--Police Technical Assistance Report (Washington, D.C.: Public Administration Service, 1977).

geographical areas. Similarly, normal expansion of workload by the original membership may place unanticipated demands on the communications service.

In overburdened systems, response time and issues of control and organization may become severe problems. As a result, consumers become less satisfied with shared service and begin to consider alternatives. Again, because police administrators are extremely concerned about their ability to communicate with patrol and field officers, there is an ever-present willingness to resume individual control of the communication service. It is therefore critical that the capacity of the communications center be planned adequately for both present and future needs.

1.3.3 Civilians

Over the years there has been considerable debate about the relative merits of using sworn or civilian communications personnel and dispatchers. Although there is no disagreement that use of civilians is considerably less expensive and that their use may free sworn personnel for other duties, the use of civilians is sometimes resisted. Schwartz has identified lack of job knowledge, officer anxiety about quality and dependability of civilians, higher civilian attrition rates, costs of supervision, abuse of sick leave, and tardiness as potential problems involving the use of civilians in police work.*

Some of these reservations were raised by respondents to our telephone survey. However, the concerns voiced did not appear to center around the use of civilians per se, but the background and knowledge of civilian dispatchers: patrol officers apparently wanted some assurance that dispatching staff would be sufficiently knowledgeable about the requirements of police work and the information needs of patrol officers.

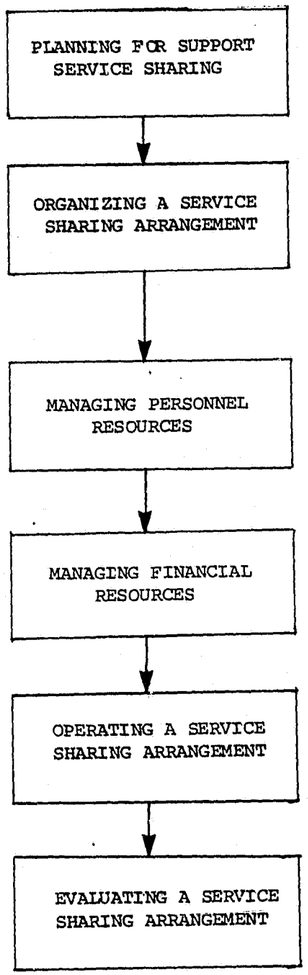
*National Institute of Law Enforcement and Criminal Justice, U.S. Department of Justice, Employing Civilians for Police Work, by Alfred I. Schwartz, Alease M. Vaugh, John D. Waller, and Joseph S. Wholey (Washington, D.C.: U.S. Government Printing Office, 1975).

1.4 Steps in System Development

As illustrated in Exhibit 1.1, Chapters 2-7 are organized around the key steps in the development of a shared communications system: planning, organizing, managing, operating, and evaluating. The steps constitute a blueprint that jurisdictions can follow in developing shared communications or other services, or in upgrading an existing system. The degree to which, and the ways in which, particular jurisdictions can employ these steps will depend on local needs and circumstances. However, the steps can serve as a general guide to the decisions and activities that such a system will require.

Exhibit 1.1

SYSTEM DEVELOPMENT PROCESS



Chapter 2

- Developing Interest and Support
- Determining Type of Sharing Arrangement
- Deciding on Nature and Level of Service
- Establishing a Written Agreement
- Ratifying the Agreement

Chapter 3

- Building an Organization Structure
- Formulating a Decision Making Process

Chapter 4

- Employment Planning
- Recruiting
- Selecting
- Training and Development
- Compensation
- Performance Appraisal

Chapter 5

- Budgeting
- Financing
- Auditing

Chapter 6

- Choosing Facilities and Equipment
- Providing Services
- Keeping Records

Chapter 7

- Measuring System Impact
- Measuring System Process
- Measuring System Costs

Chapter 2

PLANNING FOR SUPPORT SERVICE SHARING

The future success of any shared communications system is dependent upon careful initial planning. While a system can be instituted quite rapidly, the time invested in examining options, anticipating obstacles, and developing broad support will minimize future problems with the system.

- The absence of preliminary planning has created financial, service, and procedural burdens for an agency supplier arrangement in Texas. The supplier has found the combined workload is more than its staff can handle, but it cannot afford any expansion to meet the new workload. In addition, members do not all agree on what constitutes necessary radio voice traffic; sometimes an emergency call of one department can be drowned out by the routine calls of other departments.
- Central Police Dispatch, a joint provision arrangement in Muskegon, Michigan, was established pursuant to feasibility research--technical aspects were investigated by a manufacturer of police communications equipment and organizational aspects were studied by representatives of the potential members.* This system is nationally recognized for its success, and was chosen by the National Institute of Law Enforcement and Criminal Justice as an exemplary project.

The preliminary investigation and planning phase for sharing communications involves the five basic steps highlighted in Exhibit 2.1:

1. Interest and support for the shared communications system must be developed;
2. The service arrangement must be identified;
3. Interested jurisdictions must decide how the service will be provided--technically, organizationally, financially, and legally;
4. Each jurisdiction must enter into a written agreement; and
5. The agreement must be ratified by member jurisdictions.

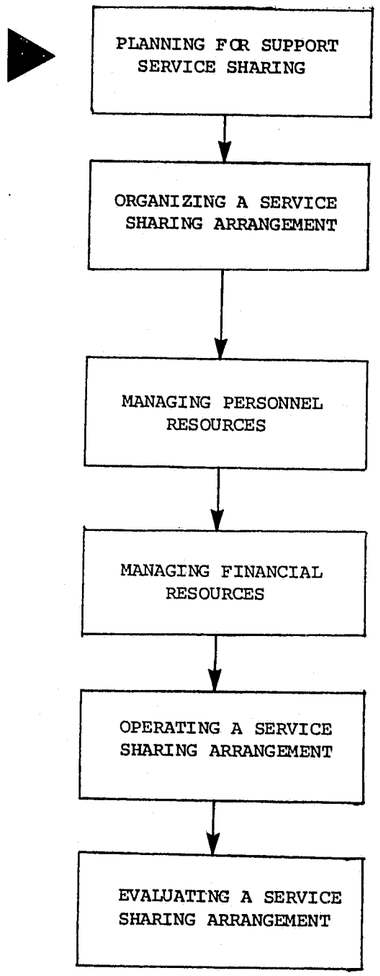
2.1 Develop Interest and Support

The impetus for shared communications systems is usually generated when an individual in a public safety department or other government agency identifies a specific communications problem--financial pressure, channel congestion, or obsolete equipment--and recognizes that sharing could offer a

*National Institute of Law Enforcement and Criminal Justice, An Exemplary Project: Central Police Dispatch, p. 9.

Exhibit 2.1

PLANNING FOR SUPPORT
SERVICE SHARING



Chapter 2

- Developing Interest and Support
- Determining Type of Sharing Arrangement
- Deciding on Nature and Level of Service
- Establishing a Written Agreement
- Ratifying the Agreement

Chapter 3

- Building an Organization Structure
- Formulating a Decision Making Process

Chapter 4

- Employment Planning
- Recruiting
- Selecting
- Training and Development
- Compensation
- Performance Appraisal

Chapter 5

- Budgeting
- Financing
- Auditing

Chapter 6

- Choosing Facilities and Equipment
- Providing Services
- Keeping Records

Chapter 7

- Measuring System Impact
- Measuring System Process
- Measuring System Costs

politically viable solution. This individual could be a police officer who convinces the chief that sharing offers a possible means to relieve chronic channel congestion, or a mayor who reviews the public safety budgets and concludes that sharing communications might reduce duplicative costs. The statement of the former Chief of Police in Elk Grove, Illinois illustrates the role played by this individual:

> There has been no lack of study devoted to the police communication problem. I was aware of this a quarter of a century ago as a rookie patrolman in Kalamazoo, Michigan. I was more aware of this nine years ago when I came to Elk Grove Village, Illinois. Now I was responsible. I had to get involved in the problem without becoming a part of it.*

His response was to take the lead in developing a regional communications system that now serves the police and fire departments in four suburban communities. This joint provision system has solved the members' problems with channel congestion and provides highly efficient, professional communications services at a reasonable cost.

A major stumbling block for any new idea is the process of developing interest and support for the concept. Without concrete information on the feasibility and benefits of a new approach, most agencies and individuals are unlikely to consider new procedures or programs. Thus, the first task in developing a shared communications system is to conduct preliminary research on the concept. The information on potential benefits, options, and approaches gained through the preliminary research can then be used to develop support of key officials within the originating jurisdiction. Once these individuals lend their support to the concept, the agency can begin the same process with surrounding jurisdictions. By sharing the results of the preliminary research and requesting the participation of other law enforcement agencies, the originating agency may develop interest and support of other potential participants. This group will then form the basis for the serious technical and organizational planning which must precede any new venture.

Responsibility for developing interest and support for the shared communications system will usually rest with the chief executive of the originating agency--in fact, without the active interest and support of this key figure, the effort is unlikely to succeed. However, technical assistance

*Harry P. Jenkins, "Northwest Central Dispatch Project," APCO Bulletin (June, 1972).

in the initial research effort can usually be obtained through such individuals as the police planning officer, the police communications specialist, or the city planning department. The basic stages of developing interest and support are examined in greater detail below.

2.1.1 Preliminary Research

The official charged with carrying out the initial examination should study the advantages and limitations of sharing arrangements, their organization and operational characteristics, and the experiences of jurisdictions who have tried them in the past. The purpose of the preliminary research is to allow the official to develop a brief, coherent proposal which can then be presented to other officials. There are several sources of information which the individual can use to obtain a familiarity on how such a system might work, what resources are available, and who might provide advisory assistance:

- Statewide Criminal Justice Planning Agencies (SPA) are a good source of information and advice. SPAs can also provide the names of shared communications systems in the state which can be contacted for further insight. A list of those states which currently have an SPA is included in Appendix A.
- The State Police Communications Division may be able to offer relevant advice on the local communications situation, since they conduct statewide communications studies in some states.
- Relevant independent statewide associations and commissions may also be available in some states. For example, in Illinois the Association of Centralized Communications Directors provides valuable assistance to local jurisdictions interested in sharing communications.
- Finally, there is written material on the topic. The Sources of Further Information, which appears in Appendix B, references the major publications pertaining to sharing support services.

Reading about shared arrangements and talking with people who have had experience with sharing communications will allow the official to formulate a tentative proposal which can be used to "sell" the idea to other officials. The official should be prepared to explain:

- how sharing can alleviate the communications problem which initially sparked the consideration of sharing;
- what the different types of sharing arrangements are;
- what the experience of existing systems has been;

- what sources of information and assistance are available; and
- a summary on how a shared system might be established in their jurisdiction.

2.1.2 Develop Support

If this preliminary research suggests that a sharing arrangement seems feasible, the initiating official must develop support for the arrangement from other executives and public safety officials in his/her own jurisdiction. Both informal discussions and formal proposals can be helpful in this regard.

Because all officials within a community share a common interest in the safety of their citizens, local support can be gained when the proposed system offers a possibility to enhance the safety of the community. The preliminary research can be used to present potential benefits, for instance:

- Showing how the local communications problem might be solved: the town provides only daytime dispatch, but under a shared system 24-hour service could be available to handle night emergencies;
- Explaining the benefits experienced by members of existing systems: a nearby town reported that as a result of its participation in a shared system, the average response time of its police department fell by four minutes; and
- Summarizing common advantages cited in the literature: a number of authors state that sharing can provide the professional communications staff necessary to ensure officer safety through swift and accurate dispatching.

In addition, local government officials are concerned with responsible management of community funds; therefore, government support can be enhanced by possible cost efficiencies, such as:

- The police department provides full-time dispatch, but the facility could easily handle more work. By "selling" communications to nearby agencies the department could defray its own operating costs without detracting from its current level of service.
- The communications facility is in dire need of upgrading, but the plan for new equipment purchases includes expensive items which will be used to only 20 percent capacity. By sharing, the department would pay only 20 percent of the cost of these items.

On the other hand, public safety officials are interested in increasing their abilities for command and control functions. Their support can be developed when sharing offers the possibility of more sophisticated equipment and improved service, such as:

- Repeater stations to reduce "dead" spots: areas where mobile units cannot pick up the radio broadcasts, especially from other mobile units;
- Reduced channel congestion for reliable base-to-unit communications;*
- Override capabilities to block out all traffic except an incoming emergency call;
- Professional communications staff who are capable of coordinating multi-unit efforts; and,
- Access to equipment options such as personal portable radio systems which enable officers to be reached by radio at all times.

In order to convince local officials that sharing communications merits further investigation, the discussions should focus on the benefits to this community. If sharing fails to offer any potential advantages to the originating jurisdiction, further study is simply not warranted at that time. However, where sharing may be beneficial to the originating jurisdiction and sufficient support for the concept exists, the next step is to develop support in other jurisdictions.

2.1.3 Solicit Interagency Interest and Participation

Once sufficient support has been established within the initiating jurisdiction, system planners must determine if other communities would also support the idea of a shared communications system. Typically, potential participants in the sharing arrangement must be drawn from neighboring jurisdictions, since communications signals have a limited geographical range. However, at this stage of the system development process, it is usually good practice to make liberal assumptions about the number of jurisdictions that might become involved in the system. The initiating jurisdiction should not exclude other jurisdictions simply because of a suspicion that they might not be interested or cannot be provided an acceptable level of service. Actual limitations will be determined later in the planning process, and at that time marginal candidates can assess the feasibility and desirability of participating in the system.

It is generally useful for the chief executive of the originating jurisdiction to begin contacting potential members. Initially, these contacts may be conducted by telephone, and may include only informal discussions of

*Repeater stations can add to frequency congestion problems, since two radio frequencies are needed to make one repeater channel (see Section 6.1.2).

the agency's plans. The chief executive may also attempt to gauge the needs of potential participants and their interest in exploring a shared communications system. Following these informal discussions, the originating agency may wish to hold one or more exploratory meetings at which potential consumers can learn about the benefits and requirements of a shared system and discuss their interest in shared communications. The initial research conducted by the originating jurisdiction can be invaluable in this effort. Through these meetings and discussions with other police chiefs and local officials, the system planners may evaluate the three general conditions necessary to begin exploring a shared communications system:

- Interjurisdictional compatibility. The extent to which the police chiefs and other local officials cooperate and work well together and the extent to which the jurisdictions have common social/political/economic characteristics are important considerations. Problems can arise, for example, if the system includes one poor jurisdiction with several rich jurisdictions, or involves a very small jurisdiction with much larger neighbors;
- Commonality of interest. Systems are likely to be more successful if the jurisdictions have similar communications problems (e.g., excess channel congestion), or if one agency's excess capacity can help to meet other agencies' need for increased capacity; and
- Adequate support. Sufficient interest and financial support should be demonstrated by potential members before proceeding with the planning effort.

There are two primary arguments which are persuasive in convincing other jurisdictions to explore the possibility of sharing communications: (1) cost savings, and/or (2) increased efficiency and capacity. In each of the site visit cases, interest in shared communications was generated by the prospect of one or both of these benefits:

- In Cook County, Illinois police departments became interested in sharing communications because they believed that by combining their purchasing power they could afford the advanced technology they all needed. By upgrading members' communications each department would be able to increase its capabilities in the squad cars and to keep its sworn officers on the street.
- In the Sumter, South Carolina communications system the objective was to increase efficiency and information sharing by obtaining better communications equipment. Members' secondary goal was to save money.
- Contractual sharing in Forest Hills, Pennsylvania was initiated because of a dissatisfaction with the communications service provided by metropolitan Pittsburgh. The cost of individual town provision was prohibitive, but by sharing communications costs, they felt a locally based system would be affordable.

- In suburban Los Angeles public safety agencies examined the possibility of sharing to reduce channel congestion and response time as well as to improve dispatch accuracy and recordkeeping. They decided sharing could give them access to advanced technology which would increase efficiency. The agencies also found that their individual systems were too expensive and that sharing could reduce costs.

Because communications comprises a vital and expensive support function, agency administrators and local government officials are cautious about making any drastic organizational changes in their current system. In each of the above jurisdictions, the proponents of sharing were able to convince other officials that the cost and efficiency benefits outweighed any disadvantage of changing the established system. As one official noted, once he understood the substantial benefits the new system could offer, supporting the effort was ". . .simply a case of good government. That's what we're here for."

Although cost savings and increased efficiency and capacity will be the two factors most likely to engender agencies' support for exploring a shared communication system, obvious potential limitations of sharing may dissuade jurisdictions from further participation. While some of these limitations result from the very nature of sharing, such as loss of direct local control or the individual retention of administrative functions, others result from the extent of support developed, such as when fire agencies and rescue services refuse to participate.

For example, Northwest Central Dispatch System (NWCDS) in Cook County, Illinois was initiated when two knowledgeable police chiefs agreed to spearhead the project. As a result of their efforts, the police chiefs from five towns initially agreed to explore a centralized police dispatch project; however, some of the communities had reservations about the proposal. Not all of the towns were willing to participate in a system which would not relieve them of all functions associated with communications. They felt the new system would be disjointed because individual departments would have to:

- maintain a desk officer to handle administrative phone calls and walk-in complaints;
- continue monitoring the burglar alarms for its community; and
- retain responsibility for monitoring fire alarms and dispatching fire equipment.*

*Harry P. Jenkins, "Northwest Central Dispatch Project."

In developing a potential membership these specific concerns ultimately affected membership: only three towns conducted a feasibility study and subsequently entered into a joint powers agreement. The officials in the three participating towns realized the resource and service advantages and the potential to overcome initial limitations through future expansion to include all public safety communications. These towns developed what is now a highly successful public safety system. A fourth town which initially dropped out joined soon after implementation. One non-participating town which has been interested in the system over the past decade is, as one police chief put it, "like a kid in front of a candy store window," but despite the system's observable success, "the town just won't take the plunge to change."

When developing support it is essential for proponents to address initial limitations by explaining the possibilities for future rectification or compensating benefits. It is also important to point out that further in-depth study will be required to evaluate the actual extent of both benefits and limitations.

At the conclusion of these discussions, the jurisdictions which support the shared communications approach can then enter into the next major phase of system planning: determining the type of sharing arrangement.

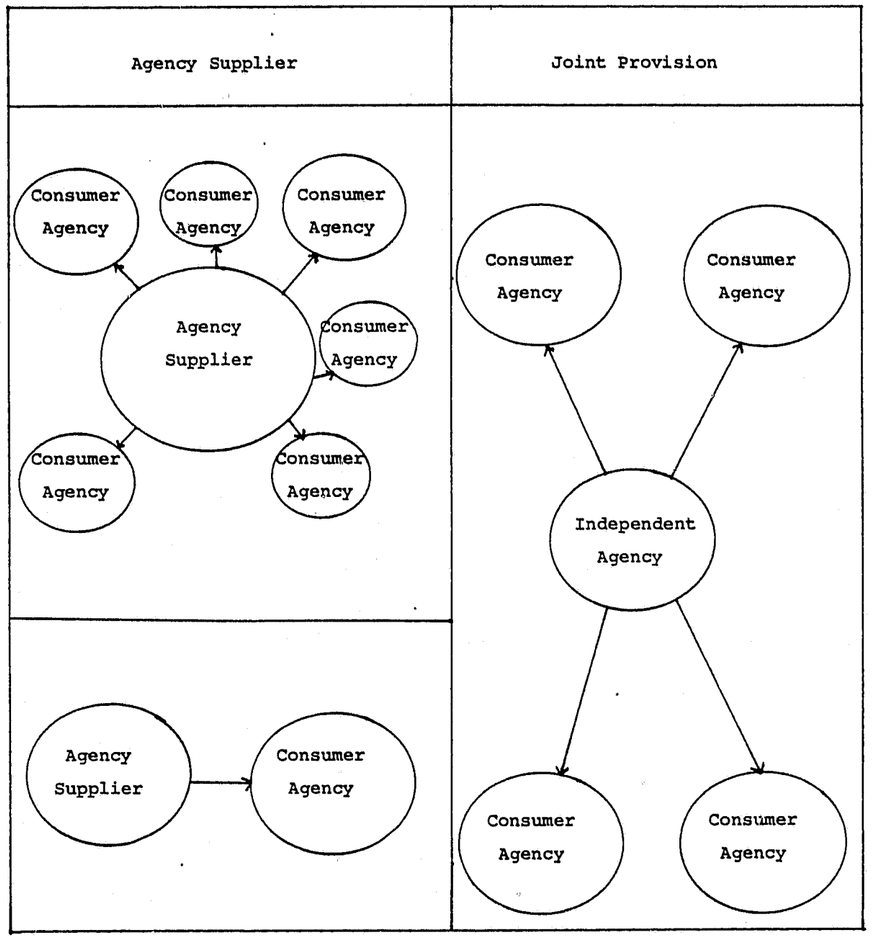
2.2 Determine Type of Sharing Arrangement

Key police and public officials who support the concept of a shared communications system must agree on the type of sharing arrangement that will best meet their organizational and technical requirements. Although many types of sharing arrangements are possible, the telephone survey results demonstrated that there are three basic patterns which predominate among existing systems. As shown in Exhibit 2.2, these three types of service provision emerge from the particular membership configuration:

- Where one large agency joined with several smaller agencies, the agency supplier approach was adopted in seventy percent of the survey cases;
- Where the county and a single city of equal size shared, the agency supplier approach was adopted in every survey case; and
- Where more than two agencies of equal size entered into a shared agreement, a joint powers agreement was adopted by all survey respondents.

Exhibit 2.2

PREDOMINANT PATTERNS OF SERVICE TYPE
TO MEMBERSHIP CONFIGURATION



These three patterns are fairly predictable. The agency supplier approach makes sense where the workload of consumers is relatively light, or where the agencies coordinate all their activities closely. In both cases the administrative time and expense of operating an independent communications facility are unnecessary. For instance, in Texas the Williamson County Sheriff's Department provides 24-hour communications for itself and four small towns using only one dispatcher per shift. On the other hand, in Sumter, South Carolina, the Sheriff's Department and the Sumter Police Department are of approximately equal size. However, since the Sheriff's Department works closely with the Police Department, resulting in high levels of interagency cooperation, the Sheriff can confidently contract with the city police for communications service, knowing the police will provide the best quality service available.

Where several medium-sized agencies want to share communications, joint provision is generally the best option. The combined workload creates high communications demands which cannot usually be accommodated through one agency's excess capacity. In addition, the agencies' working relationships are often formal and distant, making it difficult for them to entrust the communications function to a single department. One member of a joint powers arrangement felt that once a department reaches the 40-officer range the communications workload often begins to outdistance the department's budget allocations for communications, making joint powers a solid solution for similarly situated departments. Exhibit 2.3 presents the primary potential benefits and limitations of each of the three types of service provision.

In spite of the popularity and relative advantages of these three predominant arrangements, some jurisdictions have deviated from these patterns and chosen a service type based on factors other than their membership configuration. For example, SNOPAC is a joint provision facility in Snohomish County, Washington. Its membership is composed of the relatively large city of Everett, the county sheriff, and many small departments. Although an agency supplier arrangement is usually adopted with this membership configuration, SNOPAC is a joint provision system. In the early 1970s, SNOPAC and a smaller joint provision system were established pursuant to a plan for countywide communications by eventually merging the two systems. Joint provision

Exhibit 2.3

POTENTIAL BENEFITS AND LIMITATIONS
FOR TYPES OF SERVICE PROVISION

	SERVICE TYPE: MEMBERSHIP	COMPARATIVE ADVANTAGES: BENEFITS	COMPARATIVE DISADVANTAGES: LIMITATIONS
PREDOMINANT SERVICE PATTERNS	Agency Supplier: One large agency with several smaller agencies	This arrangement is typically adopted where the supplier has excess capacity and the consumers have insufficient capacity; therefore, the most significant benefits are: • Reduced Costs • Improved Service	The supplier usually absorbs the added workload into its existing structure, and there is little opportunity for consumer input; therefore, the most significant limitation is: • Interjurisdictional Disputes
	Agency Supplier: Two agencies of equal size	This arrangement is typically adopted where two agencies work closely together on a daily basis; therefore, the most significant benefits are: • Increased Coordination • Increased Information Sharing	It is unlikely either agency has sufficient excess capacity; therefore, the most significant limitation is: • Expansion of Supplier Agency's Facilities
	Joint Provision: More than two agencies of equal size	This arrangement is typically adopted where the agencies' rising workloads create financial and/or efficiency pressures; therefore, the most significant benefits are: • Increased Capacity • Increased Value per Dollar • Professional Staff	This arrangement involves establishment of an independent communications center; therefore, the most significant limitation is: • Complex Implementation

Exhibit 2.3

(concluded)

	SERVICE TYPE: MEMBERSHIP	COMPARATIVE ADVANTAGE: BENEFITS	COMPARATIVE DISADVANTAGES: LIMITATIONS
SECONDARY SERVICE PATTERNS	Agency Supplier: More than two agencies of equal size	This arrangement is typically adopted in rural areas when agencies cannot afford their own full-time communications, no member has excess capacity, and members do not want a joint powers arrangement; therefore, the most significant benefit is: • Improved Service	Although no member has excess capacity, one must be selected to supply communications for all the member agencies; therefore, the most signigicant limitations are: • Substantial Expansion of Supplier Agency's Facilities • Interjurisdictional Disputes
	Joint Provision: One large agency with several smaller agencies	This arrangement is typically adopted where agencies want to obtain a specific benefit of sharing, but the small agencies are unwilling to entrust the large agency with the communications function; therefore, the most significant benefit is: • Member Input and Control	Because one agency is substantially larger than the others, members may have difficulty agreeing upon an equitable allocation of costs, number of votes on the governing board, and so forth; therefore the most significant limitations are: • Interjurisdictional Disputes • Complex Implementation
	Joint Provision: Two agencies of equal size	This arrangement is typically adopted where two agencies work closely together but neither wants the responsibility for operating the combined communications facility; therefore, the most significant benefit is: • Independent Communications Provision	Two agencies can usually agree on control, cost, and service level issues in an agency supplier contract; therefore the most significant limitation is: • Added Complication for Implementation and Management

was selected to facilitate the merger and because no single agency could absorb the county workload. Although the two pilot projects are operational, no merger ever occurred due to political resistance and cost considerations. SNOPAC itself is plagued by the dissatisfaction of its small agency members who feel they have lost all control over dispatching procedures, available services, and rapidly rising costs. Similarly, several rural agencies of equal size sometimes adopt an agency supplier system rather than a joint provision facility because their combined workload only requires one full-time dispatcher.

Thus, it is clear that shared communications systems need not adopt only the three predominant patterns: agencies should choose the provision type which best seems to meet their needs. However, as shown in Exhibit 2.3, they should be aware that secondary approaches such as SNOPAC may offer more interjurisdictional disputes or operational complications than the more standard arrangements. While not insurmountable, those disadvantages should be given serious consideration.

No matter which service type is chosen, the central question will be "will it work?". The next section explains the primary means of answering this question: the feasibility study.

2.3 Deciding on Nature and Level of Service Provision

Feasibility studies are the keystone of the planning effort, through which members (1) determine if a shared system will work, and (2) assess how it will work. For example, on the basis of the feasibility study, potential participants can decide whether a shared communications system truly offers the best solution to their current communications needs. They can also assess the workability of their proposed sharing arrangement, given the number, nature, and resources of the potential members. At the conclusion of the study, members will have a firm plan for the communications system membership, operations, financing, and technology--a plan which will be invaluable as the members move to implement the system. Finally, by assessing the technical and organizational feasibility of the shared system before substantial effort and funds are devoted to its implementation, members can avoid the time, expense, and aggravation of later reorganizing or disbanding a poorly conceived system.

There often exists a mistaken preconception that feasibility studies are unaffordable without federal assistance. As a result, some departments make the grave mistake of omitting this step. For example, one county-supplied system participating in the telephone survey was established without first conducting a feasibility study. This system is now experiencing technical problems in the form of noise between channels and some dead areas. Organizationally, consumer agencies are dissatisfied because there are no procedures for handling service complaints, nor is there anyone responsible for resolving disputes. Finally, the county supplier has found itself in financial difficulty and can no longer afford to run the system. Fortunately, cooperation is high and the function will be transferred to a participating city police department.

The feasibility study is best divided into three simultaneous, short-term and intensive efforts: (1) technical, (2) organization/financial, and (3) legal. While each component is essential to the study, none has to entail an expensive, complex evaluation. Among the elements that must be included in the feasibility study are:

- A list of potential participants;
- An outline of the desired service type identifying the supplier and consumers;
- A list of currently available resources including members' communications budgets and communications equipment;
- An estimate of members' current communications workload;
- A memo presenting the communications problem(s) which members are seeking to overcome through sharing; and
- A list of local, state, or federal restrictions on the sharing arrangement.

This information will be needed for all components of the study to direct research efforts to meet the goals and resources of the members.

2.3.1 The Technical Study

This component of the feasibility study deals with potential user demand and the capacity of existing or available equipment to meet that demand. More specifically, the technical study is designed to estimate:

- number of users and usage levels;
- available radio frequencies;
- equipment availability and compatibility;

- dispatcher facilities; and
- transmitter location and power requirements.*

Jurisdictions considering shared communications have some flexibility in deciding who should conduct the technical study. If each agency has a communications specialist, they can collectively conduct the study. This option is advantageous because the specialists will already know the intricacies of the departments' operations and equipment; however, not all departments will have staff with the required technical expertise. Alternatively, if sufficient financial resources are available, an outside communications specialist can be hired on a consulting or contractual basis. Although such specialists are expensive and will generally be unfamiliar with the individual agencies, they typically have extensive professional experience with the engineering and organizational requirements of shared systems. When hiring specialists, engineers rather than radio technicians should be employed because the former can view present state-of-the-art hardware as an integrated system rather than as individual pieces of equipment. However, local technicians may be contacted during the study in order to uncover day-to-day communications problems unique to a specific geographic area; such information is often overlooked by or unknown to consulting engineers. One final option is to obtain such technical assistance from equipment manufacturers. Although their services are often provided free of charge, they may be less objective than local specialists or independent consultants.**

The technical report should contain at least five sections: (1) a statement of the problem; (2) a discussion of the technical advantages and limitations of sharing; (3) a description of how the system will operate to meet the communications problem; (4) a list of other service options; and (5) a statement of equipment specifications. Each of these sections focuses on providing an optimal technical plan given the members' current resources and workload.

1. Statement of the Problem. This section will be unique for every system as it presents primary communications concerns of its particular members. For example, the technical feasibility study

*National Institute of Law Enforcement and Criminal Justice, An Exemplary Project: Central Police Dispatch, p. 73.

**Ibid.

for the County of San Diego focused on two concerns of the area: (1) the portion of the radio spectrum available for police radio in Southern California was fully used and communications demands were rising; and (2) public safety agencies lacked interagency communications to coordinate regional public events, such as riots, and regional natural disasters such as earthquakes.*

2. Technical Advantages and Limitations. This section will address technical benefits and limitations of implementing a shared system to meet the communications problems. For instance, in the County of San Diego report the problem of channel congestion and possible solutions were examined in depth. The technical group found that while applying 30 to 35 units per channel was generally considered to be satisfactory, in San Diego County more than that many units were applied to each channel. This meant the county had become "communications limited;" that is, long messages such as vehicle/person checks had to be eliminated. The group then examined the possible use of a less desirable radio frequency band and determined that it would not work because of the county's topography. They concluded centralized communications provided the only solution to the channel congestion as sharing would allow optimal use of channels and distribution of voice traffic.**

3. System Operation. This section explains how the system will actually operate to solve the communications problem and requirements. For example, the members of the Northwest Central Dispatch system in Illinois insisted upon backup facilities to minimize their vulnerability to natural and man-made disasters. The technical group devised a comprehensive backup system: if the base station transmitter fails, another transmitter on the same frequency would be available; if a commercial power failure occurs, emergency power generators would take over; the areas covered by receivers (the device which picks up an officer's radio signal) overlap so if one receiver goes out the area of that receiver would still be covered by the remaining receivers; if the leased telephone lines to the centralized facility fail there would be a manual relay system; and for a complete telephone system failure there would exist a radio backup for inter- and intra-department communications.

4. Service Options. This section describes equipment which is not essential to the provision of communications, but which enhances the service provided. These service options include features such as: "automatic number identification," which flashes the caller's number on a CRT which can then be used to obtain the name and address of the caller; "called party hold," which allows a number to be traced even if the caller hangs up; a machine to receive calls from deaf citizens; special blue lights which have

*California Council on Criminal Justice, Final Report on the Feasibility of a Coordinated Records and Communications System for Region XI.

**Ibid.

a calming effect for the dispatch room; "forced disconnect," to allow police to clear a telephone line immediately; or bullet-proof glass for the dispatch room.

5. Purchase Specifications. This section presents a list of the new equipment which will be needed by the system. This list should contain enough detail to serve as the basis for competitive bidding by private manufacturers of police communications equipment. The technical specifications specify the capabilities required to handle the local geography and population density. In addition, specifications should include a description of the system; reliability and maintenance specifications; and provisions for testing the equipment before accepting it.

While the technical study will determine how communications service will be provided, it may also determine who can participate. This occurs because potential participants in the sharing arrangement must be drawn from neighboring jurisdictions due to the limitations of communications technology. For example, distance between member jurisdictions is an important consideration since radio transmissions will not carry well over a long distance without the aid of expensive repeater stations. The nature of the local terrain can also influence the number and location of member agencies. A region with relatively flat transmission terrain can accommodate members spread over a large area without "state-of-the-art" communications equipment. On the other hand, in mountainous regions only a few jurisdictions can expect to share communications services unless sophisticated equipment is acquired. Exhibit 2.4 summarizes the trade-offs that are made when assessing the impact of geographical constraints on a potential communications system.

Exhibit 2.4

ASSESSMENT OF POTENTIAL GEOGRAPHICAL AREA
COVERED BY SHARED COMMUNICATIONS SYSTEM

	EQUIPMENT SOPHISTICATION	
TERRAIN	High	Low
Flat	Very large geographical area	Large geographical area
Mountainous	Large geographical area	Small geographical area

The technical study may show that given the available resources, the proposed system cannot economically service all interested participants.

2.3.2 The Organizational and Financial Study

The organizational and financial study establishes a managerial and operational framework for the sharing arrangement. It suggests how the communications system will be organized, directed, staffed, funded, and evaluated. Because this component of the feasibility study sets the parameters for any future sharing, it is crucial that police and local officials from each jurisdiction participate in its development. Although a consultant may be hired to provide technical assistance, many jurisdictions have found that local government and/or law enforcement officials possess sufficient expertise to conduct this phase of the study without outside help.

As with the technical component of the feasibility study, the organizational research will produce recommendations in a written report. This report should cover six basic topic areas: (1) statement of goals; (2) organizational structure and decision making process; (3) personnel management; (4) financial management; (5) dispatch and recordkeeping procedures; and (6) evaluation.* The statement of the sharing arrangement's goals reflects the members' communications problem: typically it specifies that the current level of service will be maintained at a lower cost, or that improved performance will be provided and that the cost of the upgraded service will be less than the cost had each member upgraded separately. Such goals are important not only to motivate and direct employees but also to evaluate at some future time the extent to which and the ways in which the goals have been achieved.

The other topics of the organizational and financial study are discussed in Chapters 3 through 7 of this document and therefore are not detailed here. However, the following list summarizes the key issues that the study should address within each topic area:

Organizational Structure and Decision Making Process

- specific activities needed to accomplish the goals of the sharing arrangement, both administrative and operational;
- grouping of the activities into manageable jobs, sections, divisions, or other organizational units;
- organizational chain of command and decision making authority of member jurisdictions and system management.

Personnel Management

- number and types of personnel needed to manage and operate the sharing arrangement, both presently and in the future;

*National Institute of Law Enforcement and Criminal Justice, An Exemplary Project: Central Police Dispatch, p. 73.

- education, experience, and other characteristics required for job applicants for each position;
- process for recruiting and selecting personnel consistent with merit and affirmative action principles;
- likely training needs of system personnel and strategies for meeting those needs;
- compensation policies and levels.

Financial Management

- initial revenue and expenditure estimates and a process for budgeting them in future years;
- methods used to finance the sharing arrangement, including assessment of member jurisdictions based on population, expected use, ability to pay, and other factors; and
- provisions for independent audits of financial transactions and records.

Dispatch and Recordkeeping Procedures

- process for standardizing telephone and radio procedures of member departments, including call priority classifications;
- recordkeeping policies and procedures, including access to records by member jurisdictions.

Evaluation

- evaluation criteria by which the efficiency and effectiveness of the sharing arrangement will be judged, e.g., amount of money saved, improvements in dispatch accuracy and speed;
- evaluation policies, including who will conduct the evaluations and when;
- reporting policies, including access of member jurisdictions and public to evaluation results.

2.3.3 The Legal Study

Even if the proposed communications system is supported by a sufficient number of jurisdictions and the feasibility study shows that the system is technically and organizationally feasible, there are important legal considerations that can affect how, and even whether, the system is established.

Local, state, or even federal legal restrictions may potentially limit the options available for the cooperative provision of police communications services. For this reason it is important for the members to obtain legal advice at the beginning of the feasibility study. While the state attorney general's office can be contacted initially for general information on the state's authorizing statute, members will have to obtain their own counsel to research the legal aspects of the proposed system. Moreover, counsel must meet regularly with the member agencies to advise them of all legal impacts and restrictions on the system.

On the federal level, Federal Communications Commission (FCC) rules clearly pose a potential limitation that must be considered. The FCC is the federal agency which controls assignment of all frequency channels by issuing licenses (i.e., permission to use a particular frequency channel), to public agencies and private firms. The FCC maintains regional advisory committees throughout the country which consider applications for new licenses. If the experience of one Connecticut system is generalizable, an application to the FCC for additional frequency channels will have to demonstrate "satisfactory need." Since "need" remains open to interpretation, and because there may be considerable variance across advisory committees in their willingness to issue new licenses or their specific requirements for a formal request, departments considering shared communications arrangements should contact their FCC Regional Frequency Advisory Committee for further information.

Local laws will usually affect systems in terms of budgetary approval process and zoning ordinances for locating facilities. Members will also need to examine local charters, ordinances, other contracts, and labor agreements to make sure they are not in conflict with the sharing agreement.* It is important to identify local limitations early in the feasibility study.

The primary legal prerequisites and obstacles are usually found at the state level. There are five statutory considerations associated with

*U.S. Department of Housing and Urban Development, Office of Policy Development and Research, Interlocal Service Delivery: A Practical Guide to Intergovernmental Agreements/Contracts for Local Officials, by National Association of Counties Research Foundation (Washington, D.C.: U.S. Government Printing Office, 1977), p. 4.

shared communications arrangements: (1) legislative or constitutional authorization for the cooperative exercise of certain powers by government entities; (2) statutes governing interstate sharing of services like communications; (3) the need to meet state communications standards; (4) the effects of "Home Rule" (local control) arguments on system establishment and operations; and (5) unintended consequences of other state statutes, such as state employment laws.

1. Authorization for Cooperative Efforts. Because municipal powers are directly derived from state law, two governmental entities cannot cooperatively exercise their powers without express state authorization.* State authorization can appear in two basic forms: (1) legislative acts, and (2) constitutional provisions. During the planning stage, it is essential to obtain legal advice from local and state legal officials on both state law and court interpretations of those laws. The discussion in this section cannot serve as a substitute for legal assistance because the actual scope of the laws varies widely from state to state:

(1) How the service is provided. Most state laws specify that agencies may share by contracting for service or by joint provision of service. Where only one service type is specified, the availability of the other service type is unclear. For example, the Wisconsin legislature was concerned with this ambiguity. Prior to 1959 their statute provided for "the joint...exercise of any power...;" however, in 1959 the statute was amended to remedy the uncertainty by adding authorization to "contract...for the receipt or furnishing of services...."

(2) Who may share. Some laws specify which agencies may share. For example, Connecticut's law applies only to law enforcement. A number of states place geographical limitations on membership. For instance, Tennessee law states only contiguous jurisdictions may share.

(3) What may be shared. Some states impose subject matter restrictions on sharing: that is, the law specifies which activities may be shared. For example, Connecticut law is limited to law enforcement radio communications systems.

(4) How agencies may share. State law may define in detail the form of the agreement and/or the system itself. These provisions may reduce the flexibility of members to design their own system.

*Max A. Pock, Consolidating Police Functions in Metropolitan Areas (Ann Arbor, Michigan: The University of Michigan Law School, 1962).

Members may find that their state law clearly authorizes shared public safety communications. For example, a number of states have adopted the model state statute developed by the Council on Suggested State Legislation which appears in Appendix C. On the other hand, state laws are sometimes ambiguous or silent on whether law enforcement agencies may share, whether subject matter restrictions include police communications, and how sharing should occur. In such cases legal assistance is essential.

(2) Problems with Authorization for Interstate Sharing. Our telephone survey revealed that a few sharing arrangements include agencies from more than one state. A multistate membership requires careful analysis of each state's laws on sharing and sometimes requires members to seek enactment of new legislation. There are three alternative legal bases for establishing a shared communications system with members from several states: (a) interstate joint powers authorization; (b) an interstate compact; and (c) incorporation under a Not-for-Profit law. These alternatives are discussed in Appendix D.

(3) Meeting State Standards. State agencies assume a central role in coordinating police activities by establishing voluntary and mandatory standards for support services. In general, permanent agencies such as State Commerce Commissions or Police Training Boards can mandate law enforcement standards, while temporary agencies, established to study a specific aspect of law enforcement, are empowered to promulgate voluntary standards. While it is essential to meet state mandatory standards, a review of voluntary standards is often useful to help members establish their own guidelines on the quality of service they would like to have. Members should consult their State Planning Agency or the Communications Division of their State Police to see if there is a state communications plan or any other state standards pertaining to communications.

(4) The Effects of Home Rule. One legal concept that members should be aware of when organizing a shared system is that of "home rule." As with all municipal powers, home rule is a privilege derived from the state constitution or from state statute. Home rule basically allows municipalities to establish and amend their own charters within certain guidelines, without interference from the state. For example, some states do not give or deny the power of arrest to fire/arson investigators; under home rule municipalities would be able to grant them that power. There is also a trend for states to grant county home rule.

Awareness of the home rule concept is important because home rule arguments can be used by isolationist advocates to oppose actions they feel will result in loss of local control. There are basically two home rule arguments which may be used to oppose development of a shared communications facility. First, where the system necessitates new legislation or subjects the communications facility to additional state standards, opponents may attack the system on the grounds that it infringes upon home rule. However, as the home rule privilege simply provides for local control over issues not addressed in state laws, state legislatures can clearly pass legislation which narrows the province of home rule. Secondly, opponents may argue that sharing violates home rule by subjecting the municipality to outside influences and relationships. However, it can be argued that home rule is enhanced by cooperative efforts where interdependence solves local problems and thereby strengthens local government.

(5) Unintended Consequences of State Statutes. Aside from enabling laws, other state statutes may also affect the development of shared communications arrangements. In New Jersey, for example, a clause of the State Civil Service Law blocked a regional system's plan to place staff under the jurisdiction of an executive board. Instead, under the law, personnel were placed under the sole legal jurisdiction of one member's local council. In order to circumvent this unanticipated legal obstacle and implement their original plan, members had to incorporate the communications system. The time and effort needed to accomplish this delayed implementation of the regional police communications network. Fortunately, this setback did not decrease the willingness of members to participate nor the ultimate success of the arrangement.* Nevertheless, the example illustrates the importance of conducting legal research prior to the implementation of shared communications arrangements.

2.3.4 Practical Considerations

The technical, organizational, and legal components of the feasibility study are highly interdependent. As previously noted, technical aspects can

*Eskil S. Danielson, "Regionalized Police Communications: Economical, Efficient and Effective," Law and Order 27 (February, 1979).

impact membership, just as financial and legal decisions affect technical choices. This inter-relationship influences how the study is conducted in two major respects. First, it is critical that persons responsible for the technical, organizational, and legal components meet frequently during the research period to keep one another advised of findings and recommendations. These meetings will minimize time wasted on efforts precluded by the other study component, and will produce a coordinated proposal. Secondly, the studies should be short term and intensive efforts, to prevent lags in one component and to maintain the interest of all participants. As a final note, it is also useful to distribute drafts of the reports, as they become available, to all members of other study components.

2.3.5 Applying the Study Results

Upon completion of the feasibility study, the participating jurisdictions will have developed a broad general outline into a detailed functional program design. From the study results members may decide to abandon the project--perhaps because it is too costly or not technically feasible. On the other hand, members may decide to proceed with the project, in which case their feasibility reports provide a concise plan for implementation.

While the feasibility study will be the best available guide for implementation, the degree of specificity contained in the three reports will vary depending on the resources committed to the study. Where the study was conducted by professional consultants together with local staff, the reliability of the results and the degree of detail are usually high. Feasibility studies conducted without the advice of technical specialists are less expensive, but tend to be less detailed and may contain technical errors. However, successful systems have been established on the basis of low budget studies, and consultants are certainly not infallible. Members should be aware of possible limitations of their study as they implement the system design.

In addition to establishing a plan for the optimal system design, the feasibility study should help to identify the membership configuration by revealing a variety of factors which may influence jurisdictions' decision to participate. For example:

- the terrain of one jurisdiction is too mountainous for participation;
- formerly uninterested jurisdictions are impressed by the proposed technical capacity and now want to participate;

- two hesitant jurisdictions decide to participate when they realize they will save money while increasing efficiency;
- one jurisdiction disagrees on the costing formula and drops out; or
- another jurisdiction, skeptical of the management design, adopts a wait-and-see attitude and refuses to join initially.

While membership changes can and do occur during all stages of the system's development and operation, changes which occur after the feasibility study are particularly important because the agencies participating during the study period create the framework of the system. These agencies will establish the final dispatching procedures, costing formula, and so forth. Members joining later will not be able to fundamentally change this established structure.

2.4 Establishment of a Written Agreement

The next step is to establish a written agreement which reflects the understanding of all member agencies and provides the framework for the new system. Because the agreement contains binding legal provisions and must conform to the requirements of federal, state, and local law, legal counsel must be obtained when drafting the agreement.

All joint powers systems must be based on a written agreement which creates the independent entity. Agency supplier systems can be based on a verbal agreement but, as previously noted, these informal arrangements are increasingly being replaced by formal systems. For this reason, this document deals primarily with agency supplier facilities which are based on legally binding written agreements. Both the joint powers and agency supplier agreements are contracts. Thus, they have important features in common, including: (1) basic contractual provisions, and (2) establishing responsibility for injury to third parties, and consequently, handling insurance issues.

2.4.1 Contents of the Agreement

To be legally binding, all written agreements must contain basic contractual provisions. At a minimum, these provisions must state:

- who is entering into the agreement;
- what they are agreeing upon; and
- what benefit each party receives as a result of entering into the contract.

A communications contract will usually further specify:

- the level of service to be provided;
- any restrictions on the level of service;
- the amount of the service charges;
- responsibility for administering the service;
- procedures for records and reports;
- personnel policies;
- management of the facility's property;
- duration, termination, and amendment of the contract; and
- monitoring and evaluation of the shared system.

Each of these provisions is presented in more detail in Appendix E.

Although the same basic topics are covered in all written agreements for shared communications systems, the degree of specificity contained in the provisions will vary widely depending on the type of agreement and the preference of the members. For instance, in Sumter, South Carolina, the supplier agency contract covers the budget function in broad terms by stipulating that the City Police Department is responsible for "handling management tasks including planning and budgeting." In contrast, the written agreement of a joint powers system in Cook County, Illinois contains two pages of budgetary procedures.

An important consideration common to both types of documents is tort liability; that is, personal or property injury suffered by a person as the result of a wrongful or negligent act of the communication system's staff. Formerly it was difficult for individuals to sue the government for personal injury because of the doctrine of sovereign immunity. This legal doctrine

holds that governmental agencies (1) cannot be sued at all, (2) can be sued only under specific conditions, and/or (3) can be sued only up to a specified monetary amount. In the recent past this doctrine has been narrowed by the state courts and legislatures, making it easier for individuals to sue the government. Under established principles of tort law, liability follows control; therefore, since the supplying agency or joint provision center controls the communications staff, the supplier or center is likely to be held liable for injuries caused by the negligence or intentional misconduct of its employees. For example, if a dispatcher received an emergency call requesting fire department assistance at a house on 7 Oak Street, and the dispatcher purposely and maliciously failed to dispatch a fire company to that address, the owner whose house consequently burned to the ground could probably sue the dispatching facility.

While state law may protect the communications supplier for negligence under the doctrine of sovereign immunity, the public legal counsel will still incur costs to assert this immunity. Therefore, the best protection against tort liability is to obtain adequate insurance coverage, because the insurance company will defend the agency in a lawsuit, as well as providing financial resources if the agency loses or settles the suit. The means of providing the insurance coverage, funding the costs of insurance, and handling costs of any liability in excess of the insurance coverage should be stipulated in the written agreement. For example, the agreement could specify that the communications supplier would assume liability up to the full amount of its insurance coverage and consumers could agree to pay any amounts in excess (indemnification); alternatively, the agreement could permit the communications supplier to refuse liability under certain circumstances or stipulate that consumers must each purchase insurance.* Members need to check their present coverage and discuss options jointly.

Although the contents of supplier agency contracts and joint powers agreements are similar in terms of the topics covered, a joint powers agreement differs from a supplier agency contract in two major respects: (1) it

*National Sheriffs' Association, Contract Law Enforcement: A Practical Guide to Program Development (Washington, D.C.: National Institute of Law Enforcement and Criminal Justice, U.S. Department of Justice, 1977).

is far more detailed, and (2) it is sometimes subject to state-mandated provisions. The joint powers agreement contains extensive information because it establishes a separate entity; therefore, the framework for the entire system must be presented and agreed upon.

The fundamental provisions of both supplier agency and joint powers arrangements are contained in a single document, the contract. In addition, joint powers arrangements often make use of a second document--the "by-laws"--to detail the actual system operations, administration, and management. Like the contract, the by-laws are legally binding on all members. By-laws are used because they are easily changed: the contract will typically authorize amendment of the by-laws by a vote of the system's governing board. Placing technical and managerial requirements in the by-laws rather than in the contract will thus give participants the flexibility to respond quickly to changes in local conditions and needs. This advantage is exemplified in the situation where the system members decide to change dispatchers' starting salary. If the salary level is stipulated in the contract, changes in the salary level can only be made by redrafting the contract and obtaining reapproval from local governments, outside funding sources, and state agencies. On the other hand, if the salary level is prescribed in the by-laws, it can easily be changed by a vote. By-laws are thus useful for those provisions which (1) are likely to change over time and (2) will not drastically alter the basic structure of the system.

Joint powers contracts also differ from agency supplier contracts in that the state statutes governing interjurisdictional agreements may require specific contract provisions. Mandated requirements may affect costing, financing, or the contract drafting process itself. The statutes may also mandate specific language which must appear in the joint powers contract. For instance, a number of states set a maximum contract duration, usually five years, or a termination procedure, such as sixty-day written notice. However, if the state law does not mandate certain termination provisions, some survey respondents suggested that a member should be allowed to withdraw from the arrangement by notifying the other members in writing ninety days in advance, and that there should be no monetary penalty for withdrawing. In this way members do not feel "trapped" and litigation can be avoided as well.

An examples of a model joint powers agreement is presented in Appendix F of this report.

2.4.2 Drafting Procedures

While the contents of each contract may vary, the basic procedures for drafting a service contract or a joint powers agreement are identical. After any political obstacles have been overcome, the local governments adopt a resolution authorizing the staff to enter into negotiations. With the aid of the feasibility study, each jurisdiction can enter into negotiations with a fairly clear idea of the contract terms and conditions it would want adopted. Law enforcement and public officials should both participate in the negotiations. Once the parties arrive at an agreement, legal counsel may then draft the preliminary contract instrument. Each member then reviews the draft, and a final negotiation session may be held to settle any disagreements on the terms.

2.5 Ratification

In almost all of the arrangements examined in the telephone survey, the city councils or county commissioners in each jurisdiction had to ratify or approve the instrument prior to signing the agreement. The speed of obtaining this approval will vary among localities depending upon the form of government and the personalities involved. Problems may arise when some of the members have a time-consuming decision making process, as this can subject system planning to significant delays. When some members have a form of government with a particularly lengthy decision making process, it is advisable to get preliminary approval from that government early in the project.

Although the institutional structure has a substantial influence on the pace of the planning process, the enthusiasm, interest, and dedication of the individual officials involved will far outweigh the effects of the institutional structure. Thus, the major political concern will be to convince the government officials of the merits of sharing and overcome political objections to sharing.

Proponents of a shared communications system will often encounter resistance to the proposal. By using their feasibility study to prepare presentations on the proposed system, members can address political objections and controversy in a forthright manner, and gain the support of the community. Exhibit 2.5 presents concerns which can be anticipated and notes

Exhibit 2.5

ADDRESSING POTENTIAL COMMUNITY CONCERNS

	POTENTIAL CONCERNS	AUDIENCE	NEEDED RESPONSE INFORMATION--EXAMPLES
COSTING	What will be the amount and source of implementation funds?	Local Government Taxpayers	• Amount of new investment required; • Availability of state or federal grants; • Possibility of selling bonds; and • Possibility of tax increase.
	What will be the change in operating costs, and how would cost increases be covered?	Local Government Taxpayers	• Amount of current operating costs and estimated new operating costs; and • Possibility of tax increase or decrease.
	What protection will be used against unreasonable cost increases?	Local Government Taxpayers	• Analysis of costing formula; • Provisions for local input on policy and management issues; and • Agreement termination clause.
SAFETY	What will be the effect on response time?	Local Government Public Safety Administrators Line Officers Citizens	• Current response time and estimated new response time; and • New equipment and procedures affecting response time.
	What will be the effect on inter- and intra-agency communications?	Public Safety Administrators Line Officers	• Estimated changes in efficiency; • New equipment and procedures affecting communications; • Estimated changes in the quality of communications (e.g., reduced congestion); and • Total changes in technical capacity.

Exhibit 2.5
(continued)

	POTENTIAL CONCERNS	AUDIENCE	NEEDED RESPONSE INFORMATION--EXAMPLES
(continued) SAFETY	What will be the problems during the transition period?	Local Government Public Safety Administrators Line Officers Citizens	• Anticipated problems during transfer of existing equipment and staff; • Anticipated problems during acquisition and installation of new equipment and hiring of staff; and • Planned process for transition
	Will there be a back-up system in case of system failure?	Local Government Public Safety Administrators Line Officers	• Provision of emergency generators at the facility; • Provision of back-up system outside of the facility; and • Relative ease/difficulty of switching to the back-up system.
	What will be the effect on monitoring burglar and fire alarms?	Business Community Citizens	• Who will handle monitoring function; • New equipment and procedures; and • Changes in cost.
STAFFING	What will be the effect on communications staff?	Public Safety Administrators Line Officers Communications Staff	• Anticipated numbers of communications employees to be retained, transferred, or hired; • Changes in personnel policies; and • Planned changes in personnel status from sworn to civilian.
	What will be the effect on personnel costs?	Public Safety Administrators Local Government	• Amount of increase or reduction in overall salary costs; • Additional costs associated with retention or hiring of desk officer; and • Amount of changes in benefits and fringe rate.

Exhibit 2.5

(concluded)

	POTENTIAL CONCERNS	AUDIENCE	NEEDED RESPONSE INFORMATION--EXAMPLES
STAFFING	(continued) What will be the quality changes in personnel?	Public Safety Administrators Line Officers	• Planned or existing applicant screening and selection procedures; • Planned or existing training; • Planned or existing monitoring procedures; and • Proposed or existing quality standards.
	Will there be changes in supervising and management functions?	Public Safety Administrators Line Officers	• Who will supervise; • Anticipated procedure changes; • Who will manage; and • Changes in management structure.
CONTROL	Who will make the policy decisions?	Local Government Public Safety Administrators	• Provisions for policy board composed of member governments; and • Procedures for consumer input.
	Who will make the operational decisions?	Local Government Public Safety Administrators Line Officers	• Provisions for operational board composed of member agencies; • Duties of manager; and • Procedures for consumer input.
	Will there be an opportunity for officer input?	Line Officers	• Provisions for liaison board composed of agency commanders; • Provision for complaint procedures; and • Procedures for officer input.
	To what extent will each member lose control over its communications functions?	Local Government Public Safety Administrators Line Officers Citizens	• An individually subjective judgment based on all of the above factors and any additionally available information.

which audience generally voices the concern. Proponents must be prepared to explain how the proposed system will affect or resolve these concerns. For example, local government officials will want to hear about costing as a policy consideration; therefore, a member official should present the cost implications of the new system and a police financial officer can offer comparative cost information on the present system. Presentations or meetings can be held for (1) government decision makers, (2) public safety agency staff, and (3) community groups and civic organizations. The citizenry is best reached by media in the form of press releases.

After ratification, the document is signed by member jurisdictions, witnessed, and recorded according to state law. The organizing procedures which follow the signing are described in the following chapter.

Chapter 3
ORGANIZING SUPPORT SERVICE SHARING

Organizing involves identifying the activities and jobs included in a service sharing arrangement and establishing productive working relationships among them. Organizing seeks to define an efficient organization structure and decision making process that will enable the sharing arrangement to accomplish the goals and objectives developed during its planning phase with minimum expenditures of time and money. An efficient organization helps the sharing arrangement to offer member jurisdictions the same level of service that they had before they joined the arrangement but at reduced cost, or increased service at the same cost.

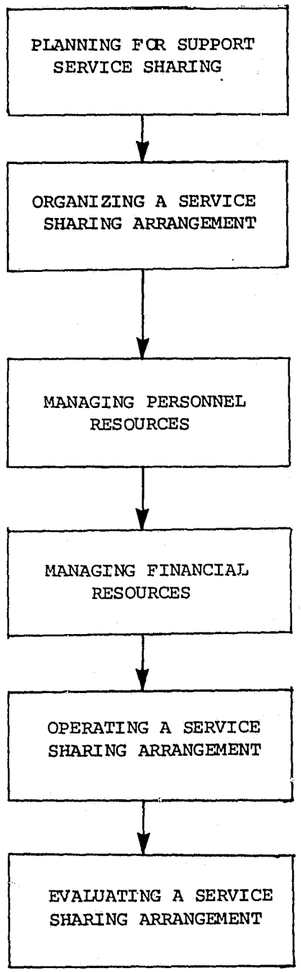
There is some disagreement over how much organization is really needed. Some people claim that if you hire good employees, they will do good work no matter how confused the organization's structures or procedures are. It is even said that ambiguity in an organization is an asset in that it forces teamwork because everyone knows they must cooperate to get anything done. Others counter that to be effective an organization must be a "tight ship" with a clear chain of command and explicit rules. They argue that a business or government agency with a first rate organization can hire second rate personnel and still be productive.

The fact is that neither position is correct. Some outstanding employees succeed anywhere, some incompetent ones function nowhere, and most perform best in a well-designed organization. There is little doubt that good managers and staff work together most effectively if they know the parts they are to play in any joint effort and how their roles relate to one another and to the objectives of the sharing arrangement. Moreover, it is difficult to recruit or retain anyone, regardless of how talented or untalented, to a poorly defined position in an ambiguous structure. This is as true in a shared communications system as it is in a hospital, supermarket or, for that matter, in football or baseball.

As illustrated in Exhibit 3.1, Chapter 3 examines the organizing of a shared communications system in two sections. First, it discusses how to build an organization structure by identifying, grouping, and coordinating

Exhibit 3.1

ORGANIZING A SERVICE
SHARING ARRANGEMENT



Chapter 2

- Developing Interest and Support
- Determining Type of Sharing Arrangement
- Deciding on Nature and Level of Service
- Establishing a Written Agreement
- Ratifying the Agreement

Chapter 3

- Building an Organization Structure
- Formulating a Decision Making Process

Chapter 4

- Employment Planning
- Recruiting
- Selecting
- Training and Development
- Compensation
- Performance Appraisal

Chapter 5

- Budgeting
- Financing
- Auditing

Chapter 6

- Choosing Facilities and Equipment
- Providing Services
- Keeping Records

Chapter 7

- Measuring System Impact
- Measuring System Process
- Measuring System Costs

the system's activities. Second, it explores how to formulate a decision making process that allows appropriate participation in the system's management and operations by its employees and member jurisdictions.

3.1 Building an Organizational Structure

An organizational structure is a formal expression of the relationships that exist between the organization's activities and objectives and between its management and employees. In the case of a shared communications system designed to cut costs and reduce channel congestion, activities can be grouped as either administrative (hiring staff, paying bills, ordering equipment, etc.) or operational (receiving complaints, dispatching patrol units, etc.). At the lowest level of the organization, clerks handle the administrative details while communications operators are responsible for the operational side. Their activities are coordinated by whatever management structure the system has chosen to adopt: smaller systems would have the operators and clerks report to the system's executive director or other top manager whereas larger systems would have them report to middle managers (e.g., shift supervisors) who would, in turn, report to higher level management. As shall be explained, the larger the system, the more levels between the top and bottom of the organization.

In summary, as depicted in Exhibit 3.2, building an organizational structure involves:

- Activity Analysis: determining the specific activities that are necessary to accomplish the goals of the sharing arrangement;
- Departmentation: grouping the activities into manageable jobs, sections, divisions, or other organizational units; and
- Coordination: providing a means for directing individual and unit effort toward the accomplishment of organizational goals.

Theoretically, these steps are followed sequentially when organizing a shared communications system or other enterprise. Activity analysis is the basis of departmentation which influences decisions on coordination. Actually, however, organizing is a continuous process, and the activities themselves and their groupings are simultaneously under consideration at all levels, in order to maintain the organization's relevance to current needs and circumstances.

Exhibit 3.2

ORGANIZING PROCESS

1. ACTIVITY ANALYSIS

Activity #1

Activity #2

Activity #3

Activity #4

Activity #5

Activity #6

Activity #7

Activity #8

Activity #9

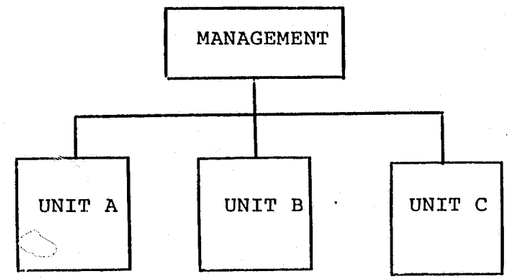
2. DEPARTMENTATION

UNIT A
Activity #1
Activity #2
Activity #3

UNIT B
Activity #4
Activity #5
Activity #6

UNIT C
Activity #7
Activity #8
Activity #9

3. COORDINATION



3.1.1 Activity Analysis

How should the activities of a sharing arrangement be identified? There are three basic sources: planning documents for the sharing arrangement, contacts with member jurisdictions, and investigations of other jurisdictions with prior experience in sharing communications services.

- Planning Documents. The initial source of information for system activities should be the planning documents that established the system, especially the service contract or joint powers agreement. The documents should define what services the participating jurisdictions expected to deliver to, or receive from, the sharing arrangement, including details on the work to be performed, administrative and fiscal procedures, personnel policy, property management arrangements, and internal monitoring responsibilities.
- Contacts with Member Jurisdictions. A second source of information is the member jurisdictions, particularly when planning documents are vague or outdated. Police and fire officials should be the best sources on the specific activities needed to operate the system, e.g. complaint intake procedures. For administrative activities, city managers and finance directors are likely to be most knowledgeable.
- Investigation of Other Communications Systems. Sharing communications services is not a new concept or practice. Many jurisdictions have significant experience in this area which can be studied in person or through descriptions presented in criminal justice publications or journals. In addition, many shared communications systems have ample documentation which they are glad to share with jurisdictions just getting started.

Exhibit 3.3 suggests some of what might result from an activity analysis of a shared communications system. It shows how the analysis should encompass both the administrative and operational sides of the enterprise. It also shows how broadly defined activities, or "functions," should be subdivided into specific activities which are more useful for job descriptions and assignments. For example, the major administrative function of personnel administration can be broken down to the specific activities of manpower planning and analysis, position classification, etc. Likewise, the operational function of complaint intake includes specific activities such as receive calls for service and monitor private alarms. Specific activities at this level are typically broken down still further into steps and tasks which can be incorporated into administrative procedures handbooks and operations manuals.

Exhibit 3.3

SAMPLE ACTIVITY ANALYSIS

	MAJOR FUNCTIONS	SPECIFIC ACTIVITIES
ADMINISTRATIVE	Policy Making Planning Financial Administration Personnel Administration→ Information Management Operations Management Communications Intergovernmental Relations Research & Evaluation	Manpower Planning & Analysis Position Classification Recruitment Applicant Examination Employee Selection Training and Development Performance Appraisal Health and Safety Labor Relations Affirmative Action
OPERATIONAL	Complaint Intake→ Patrol/Fire Unit Dispatch Case Disposition Reporting Equipment Installation and Maintenance Computer Programming	Receive calls for service Monitor private alarms Determine nature of complaint Enter information to computer via keyboard terminal Route non-emergency calls to appropriate agency

3.1.2 Departmentation

With the activities in mind, the next step is to decide how they can best be grouped together into manageable divisions, departments, sections, or other organizational units. The technical term for this grouping process is "departmentation," even though the final units are not necessarily named departments. Shared communications systems differ in the extent to which they are departmentalized. Smaller systems are likely to have one or two people performing all the administrative activities such as hiring staff or paying bills whereas larger systems need functionally assigned specialists or whole departments to carry out these same activities. For example, the agency supplier system headquartered in Forest Hills, Pennsylvania, is small enough that the Forest Hills Police Chief and the Borough Business Manager can administer the system in addition to their regular duties. At the other extreme, the South Bay Regional Public Communications Authority in California has staff specializing in personnel, finance, and administration and separate departments for technical services and operations.

Whether activities are grouped by individual or organizational unit, there are certain rules to follow in departmentation. First, the advantages of work specialization should be maximized by grouping similar activities together, e.g. activities related to operations should be grouped separately from activities related to routine administration. Second, in order to facilitate management control, the number of groupings should be kept to the minimum possible which will be consistent with the size of the organization and the scope of its services. Third, the groupings should be mutually exclusive so that any one activity will fit logically in only one place and thereby avoid intra-organizational "turf battles."

3.1.3 Coordination

Coordination entails a clear delineation of hierarchical and reporting relationships, i.e. who is responsible to whom and for what. It also requires a definite chain of command through which communications and commands travel between superiors and subordinates within the system.

Probably the easiest type of system to coordinate is an agency supplier type in which one police department shares its communications apparatus with other departments. An agency supplier system is generally staffed by one key individual (most likely the police chief of the supplier department) with a group of employees: telephone operators and perhaps a bookkeeper. An example of this type is the system in Forest Hills, Pennsylvania, mentioned previously

and depicted in Exhibit 3.4. The key individual is aware of the details of what is happening and personally gives instructions to the employees as to what they should do. Eventually, the employees learn the routines of repetitive activities and can proceed with minimum guidance. Many small businesses--grocery stores, dress shops, gas stations, etc.--are operated in this fashion. The key individual normally has high energy and skill, doing part of the work himself as necessary. Shared communications systems dominated by one individual are utterly dependent upon the capacity and interests of the central person.

As the system grows, the organizational structure becomes more complicated. Increases are experienced not only in the number of organizational levels but also in the number of employees supervised by the typical manager. This supervisory burden is called "span of control." Each manager can effectively control only a limited number of direct subordinates. When this number is reached, a new management level will be created.

As a result, shared communications systems may have as many as a half dozen supervisory levels between the person answering the telephone in the communications center and the general manager. In addition, the general manager in a joint provision arrangement is not the ultimate authority in the system; he usually reports, in turn, to a board of directors chosen by member jurisdictions. All these levels can be classified into six categories on the basis of degree of responsibility and compatibility of function: (1) Board of Directors, (2) General Manager, (3) Staff Department Manager, (4) Line Department Manager, (5) First Line Supervisor, and (6) Line Personnel. These levels are exemplified in Exhibit 3.5 by the management organization chart of the South Bay Regional Public Communications Authority.

1. Board of Directors. The Board of Directors of a shared communications system is composed of representatives from participating jurisdictions. These representatives can include town managers, mayors, legislators, and, less frequently, police and fire chiefs.* In an agency supplier type of system, the Board is usually advisory since the jurisdiction providing the service

*Representatives from member police and fire departments can form a separate "users committee" that provides technical and operational coordination and information to the system's board of directors and general manager.

Exhibit 3.4

MANAGEMENT ORGANIZATIONAL CHART
(Forest Hills , Pennsylvania Communications Service)

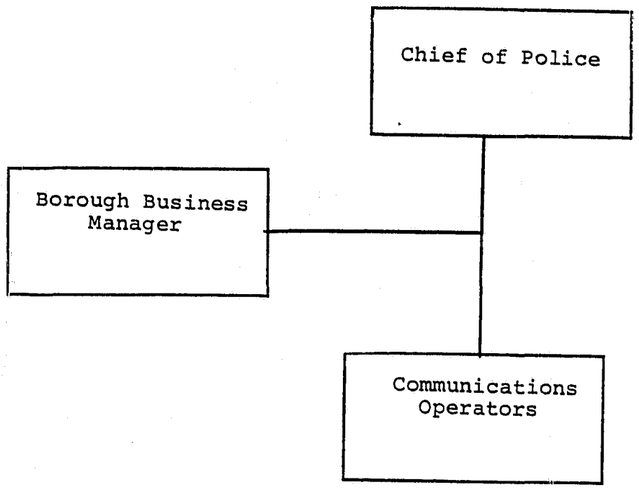
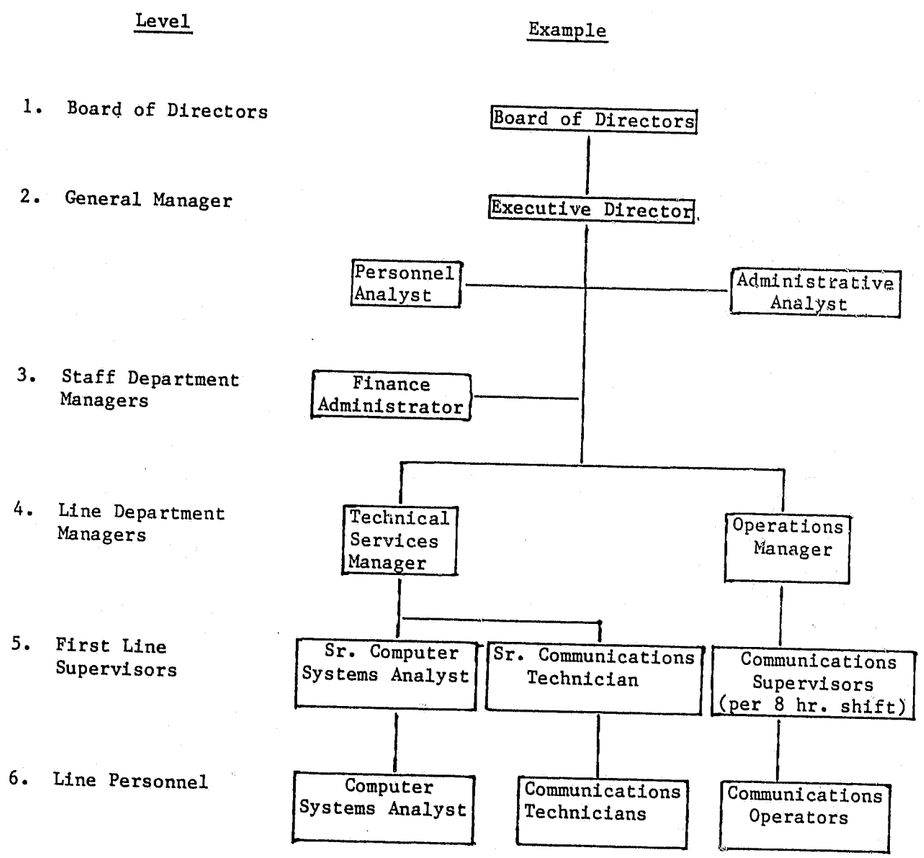


Exhibit 3.5

MANAGEMENT ORGANIZATIONAL CHART

(South Bay Regional Public Communications Authority)



retains overall control. It serves as a forum where the comments and complaints of the consuming jurisdiction can be heard and addressed. Some agency supplier systems have no board at all. The sharing arrangement is managed solely by the supplier agency, and consumer jurisdictions have no formal role in decision making. Respondents to our telephone survey from these consumer jurisdictions felt that they had lost control of their communications and that their service needs were subordinated to the suppliers'.

However, when the system is an independent authority in a joint provision arrangement, the Board has real power if it chooses to exercise it. The Board is the system's governing body whose responsibilities include:

- approving major changes in strategy, policy, organization structure, and large commitments. This assumes that carefully prepared recommendations on such matters will flow up from central management. Even if the Board approves a large majority of the recommendations made, the necessity for developing a thoughtful justification of the proposals stimulates managers to think through such changes from all angles.

- selecting top executives, approving promotions of key personnel, and setting salaries for top executives. The Board's function in selecting the general manager is a planning matter with long-run implications. If the person chosen is expected to follow the course of a predecessor, that action is a reaffirmation of the predecessor's policies and a decision to proceed as before. When a Board decides on a major policy shift preliminary to the choice of a general manager, or when it accepts policy changes as conditions of acceptance stipulated by a candidate, the Board is making a long-run major planning decision.

- approving budgets. Whether applied to cash, revenues, expenses, capital outlay, or number of employees, budgets are planning instruments whereby anticipated results are reduced to numerical terms. After adoption, they become the standard against which performance is measured for a given future period. To the extent that budgets are focused on overall system affairs, as is the case with budget summaries, or matters of major system concern, such as facilities or equipment purchase, they are properly subject to Board approval.

- evaluating results. The Board should study operating results both for prudent control and to obtain background information. This evaluation process should include asking a variety of penetrating questions. Most of these questions will be readily answered by the general manager or his staff, but a few may uncover targets of opportunity or unresolved problems. In the financial area, evaluation means a careful review of planned vs. actual expenditures for given accounting periods. Organizationally, the Board should receive reports on actions taken pursuant to Board policy. Too often, Boards approve policies and plans and then promptly forget about them.

The actual activities performed by boards of directors vary widely. Until recently, most boards left the entire administration of the shared communications system to its general manager. The rationale for such an arrangement is that operating problems can be best settled by people who have a working knowledge and long years of experience with the system. The system's management can dispose of problems in their normal daily contacts without bothering with a meeting of the directors.

But the willingness of Boards of Directors to "rubber stamp" the decisions of the general manager is reduced when rising citizen expectations and declining tax revenues make the operations of the system an issue in the participating jurisdictions. It only takes one or two incidents of a system operator dispatching fire apparatus or patrol units to the wrong location for Boards to take their governing roles more seriously. In addition, jurisdictions that are protective of their own powers and unaccustomed to sharing services are likely to limit the discretion of system managers and increase the Board's powers to a much greater extent than jurisdictions with a long and successful history of resource sharing. In such circumstances, Board membership becomes less symbolic and more active. The Board becomes a "watch dog" which can warn participating jurisdictions of pending adverse actions (e.g., service cutbacks). Furthermore, a jurisdiction's representative on the Board, especially in coalition with other Board members, may have the power to insist on one course of action or block another. A Board performing these functions is particularly valuable because such a check and independent viewpoint may not be possible within the system's internal management.

Most Boards allow one vote per jurisdiction in decision making, regardless of relative population, financial contribution, or workload. Otherwise, smaller, less affluent jurisdictions would object to their lack of influence and be less likely to join the sharing arrangement. For example, the

original agreement that established Central Police Dispatch in Muskegon, Michigan provided for one Board member for each participating jurisdiction but weighted each vote in terms of the jurisdiction's relative financial contribution to the arrangement's budget. As a result, the two largest jurisdictions possessed 67.7 percent of the voting power and could pass resolutions and take actions on behalf of the entire system even though a majority of the members were opposed. This process created so many internal problems that a subsequent agreement among the members provided for one unweighted vote per jurisdiction.*

2. General Manager. Although the Board of Directors has an essential role, the major burden of central management must be carried by a full-time general manager. Also known as the "Executive Director," "Chairperson," or "Secretary," the General Manager is the system's chief operating officer and executive. Whenever the Board of Directors is empowered to approve a policy, procedure, or personnel appointment, it usually does so at the recommendation of the General Manager. The General Manager in an agency supplier arrangement is the police chief, bureau commander, or other manager in the supplier agency who has primary responsibility for communications and for the provision of communications services to other jurisdictions. In a joint provision arrangement, the General Manager is appointed especially to run the sharing arrangement and operates independently of any one of the member jurisdictions. In either arrangement, the General Manager is responsible for administering the affairs of the system--setting standards and procedures to implement policies, establishing management controls to insure adherence to standards, addressing inter-jurisdictional coordination and problems, and meeting various emergencies as they arise.** Finally, the General Manager often represents the system in negotiating new memberships and contracts, and in hearings before government agencies and citizen groups. The diverse responsibilities of the typical General Manager are exemplified in the job description of the Executive Director of the South Bay Regional Public Communications Authority. The duties enumerated include:

---

*National Institute of Law Enforcement and Criminal Justice, An Exemplary Project: Central Police Dispatch, pp. 10-13.

**E. Dale, Planning and Developing the Company Organization Structure (New York: American Management Association, 1952), pp. 96-97.

- enforces and administers the provisions of State laws, Authority by-laws, rules and regulations, and resolutions governing the Authority;
- plans, coordinates, and directs the work of the Authority departments;
- meets with the Board of Directors and Authority committees in the determination of basic policies, and to report work done;
- recommends and advises on procedures and policies required in the public interest;
- enforces contracts, leases, and agreements;
- proposes an annual budget, providing for balancing of revenues and expenditures;
- is responsible for recruiting and selecting those individuals whose talents and abilities best serve the needs of the Authority, and manages the personnel services;
- reviews and evaluates the management of Authority departments;
- represents the Authority in a variety of meetings;
- coordinates the general activities of the Authority with other governmental agencies; and
- continually advises the Board of Directors of the financial and general conditions of the Authority, and its needs.

Wise general managers learn to focus their effort on key activities that are critical to long-run success or whose impact can be significant: recommending major policies, long-range planning, changing organization structure, selecting key personnel, and generally controlling and coordinating system operations. In addition, these general managers try to ensure that those activities they cannot perform themselves are done by someone else in the system. This conclusion leads us to the discussion of the subordinate departments and officers that report to the General Manager of a shared communications system.

3. Staff Department Managers. An important distinction in any organization, including a shared communications system, is between line and staff departments. Both types of departments assist the general manager in operating the system, but they do so in different ways. Line departments "are those which have direct responsibility for accomplishing the objectives

of the enterprise," whereas staff departments "help the line to work most effectively in accomplishing the primary objectives of the enterprise."*

Staff departments in a shared communications system serve as administrative extensions of the general manager. They help him manage the system's human resources (personnel department), financial resources (finance department), or provide general support (administration department). The smaller the shared communications system, the more likely that an individual will constitute one or more of these departments rather than groups of employees. In an agency supplier arrangement, the staff departments are not units of the sharing arrangement but units of the larger supplier jurisdiction or department which provide personnel, finance, and administrative services to the sharing arrangement.

Exhibit 3.6 suggests the types of activities for which staff departments are responsible in a shared communications system. Generally speaking, the personnel department recruits, selects, trains, and compensates employees. Finance establishes, maintains, and coordinates the accounting and financial processes of the communications system. To protect the system's fiscal integrity, an independent agent is often empowered to co-sign checks and audit the accounting records, e.g. the business manager of the supplying jurisdiction in Forest Hills or the treasurer of one of the participating jurisdictions in the independent authority in South Bay. Finally, administration is in charge of research, inventory control, public relations, and a variety of other activities delegated by the general manager.

4. Line Department Managers. In a shared communications system, the line departments have a close and continuous relationship with the delivery of communications services to participating jurisdictions. These line departments are most likely to include an operations department to receive calls for service and dispatch the appropriate police or fire apparatus and a technical services department to maintain the equipment and facilities that the system uses. Line department managers report directly to the general manager and, in turn, usually have individuals and, in larger systems, sub-departments reporting to them. This "middle manager" role is exemplified by the listing of their activities presented in Exhibit 3.7.

---

*H.L. Koontz and C. O'Donnell, Management: A Systems and Contingency Analysis of Managerial Functions (New York: McGraw-Hill, 1976), pp. 332-333.

Exhibit 3.6

TYPICAL ACTIVITIES OF STAFF DEPARTMENT MANAGERS IN A SHARED COMMUNICATIONS SYSTEM

Personnel	Finance	Administration
Recruitment & Selection	**Accounting**	**Research**
Prepares examination announcements, accepts applications, notifies candidates of times and places of various phases of examinations	Records accounts payable and receivable, performs billing and collection activities for assessments and services	Conducts special studies on various operations and procedures
Proctors written tests, scores answer sheets, sends letters to oral board members, computes final scores for successful candidates	Advises department heads regarding fund appropriation balances.	Compiles routine and special statistical data on system operations
Notifies candidates of examination results, types eligible lists and certifies names	Opens, verifies, balances, and adjusts accounts	**Control**
Compensation	Maintains subsidiary ledgers; posts, assembles, tabulates, and compares financial data	Maintains the systems operating procedures manual
Processes insurance program forms and claims	Checks or prepares invoices, time records, requisitions, purchase orders, and other financial documents	Prepares forms and other administrative devices to improve procedures and operations
Processes retirement system forms and reports	Keeps records of petty cash transactions and of receipts issued	Maintains equipment inventory control records
Processes payrolls	**Budgeting**	**External Liaison**
Recordkeeping	Assists in preparation of annual budget	Answers participating jurisdictions' questions regarding procedures, operations, regulations
Compiles regular personnel turnover report reflecting appointments, resignations, leaves and transfers	Prepares revenue and expenditure estimates	Represents general manager at public functions and system meetings
Files correspondence, reports, form letters, requisitions, and memos	Establishes accounts for proper budgetary control	Submits and coordinates federal and state grant applications

Adapted from job descriptions in use at South Bay Regional Public Communications Authority (1981).

Exhibit 3.7

TYPICAL ACTIVITIES OF LINE DEPARTMENT MANAGERS IN A SHARED COMMUNICATIONS SYSTEM

Technical Services Manager	Operations Manager
Plans, organizes, directs and coordinates the work of the system's technical and computer departments	Plans, organizes, directs, and coordinates the work of the system's operations department
Confers with the general manager on departmental policies and programs	Manages all communications supervisors and operators in their roles of providing public safety dispatching services for participating jurisdictions
Coordinates the acquisition and maintenance of the system's communications and computer equipment and services	Confers with the general manager on departmental policies and procedures
Participates in the recruitment, selection, and training of departmental staff	Meets with public officials and various police and fire officials to address mutual problems and concerns
Prepares annual budget requests for the technical and computer departments and monitors expenditures	Manages the communications center
Attends meetings of the Board of Directors	Assists in development of rules, regulations, and procedures governing dispatch
	Participates in recruitment, selection, and training of departmental staff
	Prepares budget requests for the operations department and monitors expenditures
	Attends meetings of the Board of Directors

Adapted from job descriptions in use at South Bay Regional Public Communications Authority (1981)

5. First Line Supervisors. This level of management is closest to the actual delivery of services, both externally (providing communications services to member departments), and internally (providing repairs, administrative assistance, and similar services to other units). The tasks of supervisory management are in many respects similar to those of managers on other levels because supervisors plan, implement policy, and organize. But perhaps the distinguishing trait of the supervisory level is the closeness to the mass of the system's employees. First line supervisors deal directly with operational and technical personnel and are responsible for them. In this regard, first line supervisors must be generally concerned with fostering employees' welfare and be prepared to provide detailed guidance, correct undesirable behavior, give credit for good performance, and keep everyone informed on what is going on. South Bay Regional Public Communications Authority defines three types of first line supervisors: two are assigned to technical services (Senior Computer Systems Analyst and Senior Communications Technician), and the third to operations (Communications Supervisor). The duties of each type are presented in Exhibit 3.8.

6. Line Personnel. Line personnel actually deliver the services of a shared communications system. They receive the complaints, dispatch the police and fire units, operate the computers, pay the bills, and repair the equipment. The activities of line personnel in a shared communications system are well known and reasonably standardized. For example, the position descriptions for three line personnel positions in the South Bay Regional Public Communications Authority are presented in Exhibit 3.9: computer systems analyst, communications technician, and communications operator.

3.2 Formulating a Decision Making Process

After building the organization structure, the next step in organizing a shared communications system is formulating a decision making process. Decision making involves choosing what is to be done, who is to do it, and when, where, and sometimes even how it will be done. From the manager's viewpoint, the decision making process can be defined as a "series of steps that start with an analysis of the information and ultimately culminate in a resolution--a selection from the several available alternatives and verifica-

Exhibit 3.8

ACTIVITIES OF FIRST LINE SUPERVISORS IN A SHARED COMMUNICATIONS SYSTEM

Technical Services		Operations
Senior Computer Systems Analyst	**Senior Communications Technician**	**Communications Supervisors**
Operates, programs, and analyzes computer functions	Coordinates maintenance and repair of radio and electronic communications equipment	Supervises and trains communications operators
Coordinates repairs and improvements of hardware and software with external vendors	Supervises and inspects installation of mobile radio and digital terminals in vehicles of user agencies	Coordinates dispatching of police and fire services for member agencies during assigned shift
Maintains and updates geographic base file of locations and addresses	Prepares and maintains reports required by Federal Communications Commission	Recommends changes in operational procedures
Directs activities of Computer Systems Analysts and provides training	Helps establish and implement standards of service, repair, and preventive maintenance on equipment	
Performs system updates to the data base, maintains records and files on-line and off-line.	Maintains spare parts inventory	
	Prepares and justifies requests for capital outlay equipment	

Adapted from job descriptions in use at South Bay Regional Public Communications Authority (1981)

CONTINUED

1 OF 4

Exhibit 3.9

ACTIVITIES OF LINE PERSONNEL IN A SHARED COMMUNICATIONS SYSTEM

Technical Services		Operations
Computer Systems Analyst	Communications Technician	Communications Operator
Operates, programs, and analyzes computer functions	Installs, maintains and repairs mobile and stationary radio and electronic communications equipment	**Complaints**
Maintains and updates geographic base file of locations and addresses	Inspects installation of mobile and digital terminals in vehicles of user agencies	Receives telephone calls for service and private alarm inputs
Implements changes in alarm system file	Adjusts receiver and transmitter circuits	Determines nature of complaints and codes for computer input
Performs system updates to data base	Records and files FCC measurements	Enters incident type, location, and other details in computer
		Routes non-emergency calls to appropriate agency
		Dispatch
		Reviews status of police/fire units for applicable city based on incident report
		Selects unit to respond and broadcasts dispatch information
		Enters unit status changes to computer system in response to incident

Adapted from job descriptions in use at South Bay Regional Public Communications Authority (1981)

tion of this selected alternative to solve the problem under study."* For example:

- The operations manager in a shared communications system has to select new communications operators from a pool of well-qualified applicants;
- A general manager has to pick the best proposal from among several submitted by reputable manufacturers of computer hardware; and
- The increasing number of citizen complaints about the system dispatching fire and emergency medical units to the wrong address has compelled the general manager to consider whether the problem arises from human error or equipment malfunction, and what should be done about it.

The key issue in formulating a decision making process revolves around the extent to which power and authority for these and other decisions will be centralized in the board of directors and general manager or decentralized to lower levels of the organization. Every shared communications system must decentralize to some extent. Even the manager of a very small sharing arrangement cannot both administer the arrangement and answer the telephone! The issue becomes not whether to decentralize but how much and to whom.

The most important factors in deciding the degree to which and the ways in which decision making will be decentralized are: (1) size of the shared communications system, and (2) the physical proximity of its staff and facilities. The smaller the system, and the closer the proximity of system personnel and work stations, the more centralized the decision making process since top management is able to "keep tabs" on subordinates and react quickly to their questions and concerns. The sharing arrangement in Forest Hills, Pennsylvania, is able to operate successfully with a highly centralized decision making structure because the system is small and the top manager works in the same building as the dispatchers and business manager. At the other extreme, the South Bay Regional Public Communications Authority is not only large but also has separate facilities for its operations unit and the other system units, including the office of the executive director. If the

*R.J. Thierauf et al., Management Principles and Practices (New York: Wiley, 1977), p. 123.

executive director wants to visit the dispatch center, he has to get in his car and drive several blocks. This situation calls for greater decentralization; the operations staff have to be allowed wider discretion because they are literally "on their own."

Unfortunately, conflict and inefficiencies result from vague delegations of authority. This is a potential problem for any shared communications system that decentralizes all or part of its decision making process. For any given decision, it is important to define who has to approve what and when in the decision making process. When purchasing new computer hardware, for example, can the general manager authorize the purchase on his own authority or must he seek the approval of the board of directors?

A chart of executive approval authorizations is one way of clarifying roles and responsibilities. It is a technique by which the various authority delegations of an organization can be clarified. Since most of these delegations have to do with the right to commit the organization for money, most of the chart deals with expenditure limits. However, there are other matters, such as policies and programs, which can be, and often are, shown on a chart. In addition to promoting clarity, the chart describes the entire structure of communication in an organization. Using the chart, employees or departments involved in a decision can see what the decision making relationships are.

An example of a hypothetical chart for a small- to medium-sized shared communications system is shown in Exhibit 3.10. It is based on the telephone survey and site visits conducted in preparing this report as well as on generally accepted management practices. A list of major decision areas appears on the left-hand side of the chart. Usually, it is useful to group these areas under the classifications of personnel, operating expenses, capital expenditures and commitments, and general expenses. Across the top of the chart are listed those management levels which have approval authority or whose consultation is required for advice or information. The involvement of each level in specific decisions is suggested in the body of the chart, although these suggestions will have to be adapted to fit local needs and circumstances in many cases.

Exhibit 3.10

HYPOTHETICAL CHART OF EXECUTIVE APPROVAL AUTHORIZATIONS

Nature of Decision	First Line Supervisor	Staff Department Mgr.	Line Department Mgr.	General Manager	Board of Directors
A. Personnel					
1. Employment of new personnel					
a. Hourly	All*	Personnel Mgr. reviews for consistency with system policy	All	All exceptions to policy**	
b. Salaried	All	Personnel Mgr. reviews	All	All over $2,000 per month	All over $3,000 per month
2. Wage and salary increase					
a. Hourly	All	Personnel Mgr. reviews	All	All exceptions	
b. Salaried	All	Personnel Mgr. reviews	All	All resulting in salaries over $2,000/mo.	All resulting in salaries over $3,000/mo.
3. Moving expenses	All	Processed by Finance Mgr.	All	All over $2,000	
4. Leaves of absence	All	Processed by Personnel Mgr.	All	All over 30 days	All over 90 days

*The term "All" means all immediate subordinates; it does not necessarily mean all employees in the system.

**The General Manager approves all personnel actions for immediate subordinates and exceptions to policy for lower level positions. An exception to policy would be exemplified by hiring someone without a college degree when the minimum requirements for the job include a B.A.

Exhibit 3.10

(continued)

Nature of Decision	First Line Supervisor	Staff Department Manager	Line Department Manager	General Manager	Board of Directors
B. Operating Expenses					
1. Consultants		Reviewed by Finance Mgr.	All	All	All over $5,000/ yr.
2. Supplies and maintenance services		Reviewed by Finance Mgr.		All	
3. Travel expenses	All reporting to him	Reviewed by Finance Mgr.	All reporting to him	All over $200	
4. Leases		Reviewed by Finance Mgr.		All	All
C. Capital Expenditures					
1. In accordance with approved budget		Reviewed by Finance Mgr./ Admin.Asst.	All	All individual items over $1,000	All items over $2,500
2. Not in accordance with approved budget		Reviewed by Finance Mgr./ Admin. Asst.	All	All items over $500	All items over $1,000

Exhibit 3.10

(concluded)

Nature of Decision	First Line Supervisor	Staff Department Manager	Line Department Manager	General Manager	Board of Directors
D. General					
1. Changes in Complaint/ Dispatch Procedures			Reviewed by Operations Mgr.	All	
2. Changes in Personnel Policy		Reviewed by Personnel Mgr.	All	All	All
3. Annual Budget	Consulted	Prepared by Finance Mgr.	Reviewed	Approved for Submission to Board	Final Approval

Adapted from: H. Koontz, The Board of Directors and Effective Management (New York: McGraw-Hill, 1967), pp. 46-49. (Certain limits revised in 1982)

In developing a chart, it is important to review the planning and authorizing documents (including statutes) on which the shared communications system was founded. Special restrictions may apply. It is also important for the board of directors to review and approve the chart since it defines which decision matters the board reserves for itself and which it delegates to the general manager and other managers.

* * *

Chapter 3 has presented the basic considerations in organizing a shared communications system. It has suggested how to build an organization structure that will efficiently coordinate and departmentalize the system's many activities. It has advanced job descriptions for the major functions of a shared communications system--functions that will be handled by separate individuals in a large system and by fewer personnel in a small system. Finally, it has discussed the comparative advantages of centralized and decentralized decision making and a method for defining the roles and responsibilities of the board of directors, general manager, and other managers for various types of decisions.

Chapters 4 and 5 are concerned with managing a service sharing arrangement. They discuss what happens after the system is organized and preparing to begin operations. They suggest how to recruit and direct system personnel and how to obtain and expend its financial resources.

Chapter 4

MANAGING PERSONNEL RESOURCES

Managing a service sharing arrangement is such an important and multi-faceted activity that this Issues and Practices Document devotes two chapters to it. Chapter 4 examines the human aspects of management. It discusses the personnel process by which the shared communication system's human resources are recruited, selected, trained, compensated, and appraised. Next, Chapter 5 provides guidance on managing the system's financial resources, with emphasis on revenue generation, budgeting, and accounting.

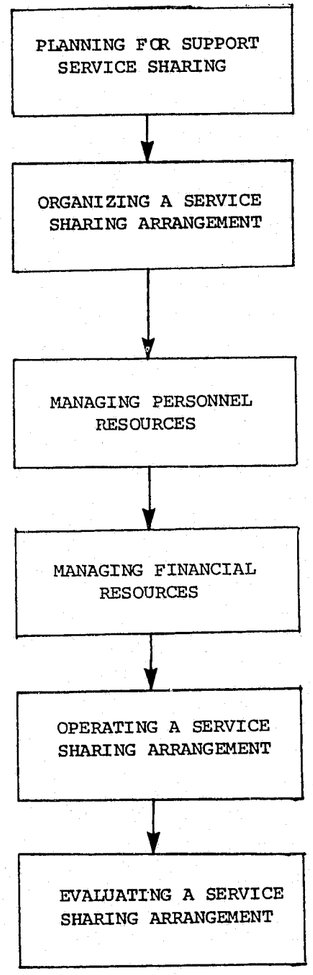
Exhibit 4.1 shows how the managing of a shared communications system relates to other steps in developing a service sharing arrangement. The exhibit suggests that the management decisions discussed in Chapters 4 and 5 are based on prior decisions in the planning (Chapter 2) and organizing (Chapter 3) processes. Planning influences management because the choice of member jurisdictions, provisions of the contractual arrangements binding members, agreed-upon levels of service and costs, system objectives, and other outcomes of the planning process influence the ways in which and the degree to which human and financial resources will have to be managed. Organizing influences management because the organization structure is where the resources will be placed, while the decision making process governs how those resources will be used. Looking beyond the management chapters, the exhibit also suggests that operating a service sharing arrangement (Chapter 6) depends on management's ability to attract sufficient human and financial resources for the system to operate effectively and efficiently. Thus, managing plays a central and vital role in the life of a shared communications system.

4.1 Role of Personnel Management

Every organization should be seriously concerned about the quality of its employees, especially its managers. Personnel/human resources administration has to do with staffing the organization structure to ensure that the enterprise can be competently operated. Everyone in a shared communications system has a responsibility for staffing. The board of directors undertakes a staffing function by selecting and appraising the general manager who, in

Exhibit 4.1

MANAGING PERSONNEL RESOURCES



Chapter 2

- Developing Interest and Support
- Determining Type of Sharing Arrangement
- Deciding on Nature and Level of Service
- Establishing a Written Agreement
- Ratifying the Agreement

Chapter 3

- Building an Organization Structure
- Formulating a Decision Making Process

Chapter 4

- Employment Planning
- Recruiting
- Selecting
- Training and Development
- Compensation
- Performance Appraisal

Chapter 5

- Budgeting
- Financing
- Auditing

Chapter 6

- Choosing Facilities and Equipment
- Providing Services
- Keeping Records

Chapter 7

- Measuring System Impact
- Measuring System Process
- Measuring System Costs

turn, exercises a similar function with respect to the major line and staff department managers. Department managers select and train their first line supervisors and employees and participate in their appraisal and compensation.

The activities involved in personnel administration can be grouped in an unlimited number of ways. This chapter describes them in an order which approximates how they would be handled in a service sharing arrangement and many other organizations:

- Employment Planning: determination of the number and types of personnel needed for system operations, both presently and in the future;
- Recruitment: identification of qualified job applicants;
- Selection: hiring the best applicants and assigning them to positions;
- Training and Development: providing classroom and on-the-job experience designed to improve the knowledge, attitudes, skills, or job performance of employees and work groups and thereby improve the productivity and effectiveness of the entire system;
- Compensation: payment of employees for services rendered; and
- Performance Appraisal: evaluation of employee performance as the basis for subsequent personnel actions, e.g. salary increase, promotion, discipline, training.

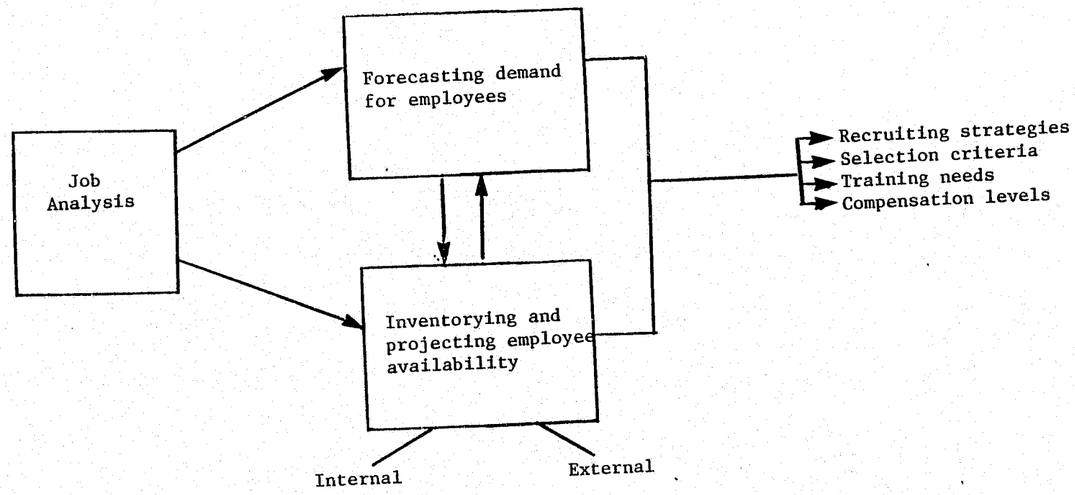
4.2 Employment Planning

Employment planning focuses on activities designed to get the right number and types of employees in the right jobs at the right time. As shown in Exhibit 4.2, it involves:

- Job analysis: identifying the types of jobs that the organization needs to operate, e.g. communications operator, computer technician;
- Forecasting demand for employees: estimating the number of each job type that will be required, e.g. 10 communications operators within next two years; and
- Inventorying and projecting employee availability: estimating capacity of member jurisdictions and the local labor market to supply adequate numbers of each job type, e.g. poor local economic conditions may generate an applicant pool substantially greater than required to recruit the 10 communications operators.

Exhibit 4.2

EMPLOYMENT PLANNING PROCESS



Employment planning can permit more productive use of human resources. It is impossible to schedule recruitment or training efforts without knowing how many staff will be needed. How large a training program should be scheduled? When? On what topics? Second, employment planning promotes staff development by uncovering future job openings and thereby allowing current employees sufficient time to gain the skills and experience needed to fill those jobs. Third, employment planning enhances the employer's ability to comply with government regulations governing equal employment opportunity, since it provides management with accurate and current information on employees' race, sex, and other key characteristics.

1. Job Analysis. Job analysis and the resultant job specifications clarify these aspects of each job: work activities; machine, tools, and equipment used; required knowledge and skills; job context, including work schedule, working conditions, and compensation; and minimum education and experience levels. This information can be in the form of qualitative, verbal, narrative descriptions or quantitative measurements of each item such as work hours per week or years of related experience needed.

There are many sources of information for a job analysis. One or more of the following methods can be used:

- examination of previous job analyses or job descriptions of the position drawn from similar organizations, e.g., a comparable shared communications system in another state;
- observation of the job and job occupant;
- interviewing the job occupant;
- structured or open-ended questionnaires to be completed by job occupant and/or supervisors;
- self-recording of data and observations, in a log or diary kept by job occupant;
- recording of job activities on film or with audio means, e.g., tape recording how communications operators handle calls for service;
- study of system procedures and policies that impact on job responsibilities; and
- analyzing equipment design information from blueprints or design data, e.g., examining communications console specifications to estimate knowledge required to operate.

Generally, examinations of previous job analyses, questionnaires, and the use of equipment design information are quickest but may supply less reliable data than other methods. Job descriptions drawn from other shared communications systems may not accurately portray actual job activities or requirements. Asking employees to complete questionnaires is likely to be viewed as an imposition and lead to a low response rate with unknown effects on the results. And, the use of equipment design information in a job analysis assumes that the manufacturer accurately assessed the knowledge and skill required to operate the equipment in on-the-job situations.

Observation, interviews, self-recording of data, and film/audio recording are more accurate since they rely on expert opinion to analyze them and determine their implications for job specification. However, they are more costly than the other methods. They consume significant amounts of time and collect much data that are irrelevant to the job analysis, e.g., the observer must undergo hours of watching operators not only take calls for service but also go on coffee breaks, sit idle, etc.

Consequently, it is often recommended that the job analysis be based on more than one method. For example, the analysis might include one method that is quick but possibly unreliable, such as the examination of previous job analyses, and one that is more accurate but costly such as observation. The strengths of each will compensate for the weaknesses of the other.

The results of a job analysis lead to a job description. A job description lists the activities of the job and the qualifications required for adequate performance. Chapter 3 suggested standard activities for the major jobs needed to operate and manage a shared communications system, e.g. general manager, personnel manager, operations manager, communications technician, etc. The qualifications typically required for each job are depicted in Exhibit 4.3.

2. Forecasting Demand for Employees. Conceptually, the future demand for employees is derived from the anticipated demand for the products/services. In practice, the difficulty lies in obtaining good measures of

Exhibit 4.3

ELEMENTS OF TYPICAL JOB DESCRIPTIONS

QUALIFICATIONS / POSITION	Education	Experience	Knowledge, Skills and Abilities	Other
General Manager	College Graduate	5 years professional experience in planning, coordinating, and financing of public programs and/or technical experience in computer assisted dispatch systems	Knowledge of public administration theory and administrative procedures; knowledge of laws governing joint powers authorities; ability to develop a balanced budget; knowledge of personnel management; ability to supervise technical work; ability to establish and maintain effective working relationships with member jurisdictions	Driver's License
Personnel Analyst	High School Graduate	2 years professional experience as personnel manager or clerk	Knowledge of employment planning, employee recruitment and selection, training, and performance appraisal; ability to manage compensation system; knowledge of laws governing personnel function and equal employment opportunity	Driver's License
Finance Administrator	High School Graduate, supplemented by courses in bookkeeping or financial recordkeeping	2 years experience in maintenance of financial records	Knowledge of elementary bookkeeping and financial recordkeeping ability to make arithmetic calculations quickly and accurately; knowledge of laws governing financial management; ability to work with employees and member jurisdictions in financial matters	Driver's License

Exhibit 4.3

ELEMENTS OF TYPICAL JOB DESCRIPTIONS
(continued)

QUALIFICATIONS / POSITION	Education	Experience	Knowledge, Skills and Abilities	Other
Administrative Analyst	College Graduate	1 year staff or administrative experience	Knowledge of methods and techniques of administrative analysis; knowledge of local governmental organization and operations; ability to analyze administrative problems and present recommendations in written or oral form; ability to work effectively with member jurisdictions	Driver's License
Operations Manager	High School Graduate	3 years experience as communications operator, preferably in computer assisted dispatching system; and 2 years experience as communications supervisor in public safety dispatch system.	Knowledge of police, fire, and emergency medical dispatching procedures and problems; knowledge of procedures and equipment involved in computer assisted dispatching systems; ability to plan and direct work of communications operators in 24-hour operation; ability to work with technical services staff and member jurisdictions	Driver's License
Communications Supervisor	High School Graduate	2 years experience as communications operator in computer assisted dispatch system.	Knowledge of procedures and equipment used in computer assisted dispatch; ability to supervise communications operators; ability to train new operators; ability to keep payroll records and prepare personnel evaluations; ability to investigate complaints and maintain effective relationships with member jurisdictions	Driver's License

Exhibit 4.3

ELEMENTS OF TYPICAL JOB DESCRIPTIONS
(continued)

QUALIFICATIONS / POSITION	Education	Experience	Knowledge, Skills and Abilities	Other
Communications Operators	High School Graduate; completion of operator training program or equivalent experience	See education	Ability to type 35 wpm and use correct grammar and spelling; ability to follow written and oral directions; ability to operate equipment and follow correct procedures for complaint intake and unit dispatch; possess good auditory and visual skills.	Driver's License
Senior Computer Systems Analyst	Associate's degree in Computer Science	2 years data processing experience	Knowledge of computer hardware and software. assembly language and FORTRAN, data base control, and data reduction, data communications and on-line terminal computer systems; knowledge of public safety computer assisted systems; ability to maintain and update data base; ability to work with other employees and member jurisdictions	Driver's License
Computer Systems Analyst	Associate's degree in Computer Science	1 year data processing experience	Knowledge of computer hardware and software, assembly language and FORTRAN, data base control and data reduction, data communications, and on-line terminal computer systems; knowledge of public safety computer assisted systems; ability to maintain and upgrade data base; ability to work with other employees and member jurisdictions.	Driver's License

Exhibit 4.3

EIEMENTS OF TYPICAL JOB DESCRIPTIONS
(concluded)

POSITION \ QUALIFICATIONS	Education	Experience	Knowledge, Skills and Abilities	Other
Senior Communications Technician	High School Graduate; completion of accredited training program in electronics	3 years journeyman level experience in maintenance and repair of radio/digital telecommunications system.	Knowledge of current FCC rules, electronic maintenance practices, and state-of-the-art system technology; knowledge of principles of supervision, including budgeting and control of equipment, materials, and personnel; knowledge and skills in installation, maintenance, and repair of telecommunications equipment; ability to establish and maintain effective working relationships with other employees and member jurisdictions; ability to read and interpret plans and specifications for complex electronics and computer equipment.	Driver's License; FCC 1st class license
Communications Technician	High School Graduate; completion of accredited training program in electronics.	2 years journeyman level experience in maintenance and repair of radio/digital telecommunications system	Knowledge and skills in installation, maintenance, and repair of telecommunications equipment; ability to read and interpret plans and specifications for complex electronics equipment; ability to perform tests on equipment and electronic circuitry.	Driver's License; FCC 1st or 2nd class license

Adapted from job descriptions in use at: South Bay Regional Public Communications Authority
Northwest Central Dispatch System

anticipated demand. In a shared communications system, the demand for services is defined as the number of calls for service it receives and the amount of time that the system needs to handle each call. Work sampling and system records can provide the average handling time for complaint intake, unit dispatch, and case disposition. Predicting the number of calls for service can be based in part on the prior experiences of member jurisdictions and comparable systems and by the contractual obligations of the system to provide its service only during specified time periods. However, the number of calls in the future is very sensitive to the uncertainties of local crime rates, citizen awareness, and other factors. Sophisticated forecasting techniques exist for estimating the impact of these factors on the number of calls for service (e.g. regression/correlation models, stochastic/probabilistic models, and expert estimate techniques) but these cannot substitute for the informed judgment of the system's management and member jurisdictions.

The future demand for employees is based on the future demand for service. Most organizations define labor demand as the number of person hours required to handle a given service level. A basic work year consists of 2,080 person hours; however, due to holidays, vacation, sick leave, and training, an employee will not be available all 2,080 hours. About 1,600 hours would be a more realistic estimate as illustrated in Exhibit 4.4. Dividing the total hours required to meet future service demands by the average employee's available hours yields an estimate of labor demand or the number of employees that the organization needs to operate.

The primary advantage of sharing in terms of labor demand is the ability to schedule staff efficiently across an entire system and thus reduce the need for staff. For example, prior to joining the Muskegon system, the eight independent jurisdictions employed a total of 19 dispatchers, and some did not have 24-hour service. In contrast, the sharing arrangement employed 13 dispatchers and provided 24-hour service for all members.*

*National Institute of Law Enforcement and Criminal Justice, An Exemplary Project: Central Police Dispatch, p. 23.

Exhibit 4.4

EMPLOYEE AVAILABILITY WORKSHEET

Basic Work Year (52 weeks x 40 hours per week)		2,080 hours
Less:	Holidays	56 hours
	Vacation	80
	Sick leave	40
	Training	80
	Other (military, lunch breaks, coffee breaks, etc.)	224
Number of Person Hours Available		1,600 hours

Exhibit 4.5 is a hypothetical example of how a shared communications system could estimate the number of communications operators needed to handle its service demand. It makes several assumptions: (1) separate dispatchers and complaint board operators, (2) significant variations in number of calls per shift and in operators needed, and (3) no productivity gains through new equipment or additional training that would produce reductions in the average time needed to handle each call (3 minutes or .05 person hours). Summing the total number of operators needed per shift yields a total labor demand of 26.2 operators in 1983 and 26.9 operators in 1984.

It should be noted that a minimum of 5 dispatchers are needed to staff any sharing arrangement that operates 24 hours per day, 365 days per year. Four dispatchers can handle the regular workload (7 days x 3 shifts per day = 21 shifts ÷ 5 shifts per dispatcher = 4 dispatchers). But a fifth dispatcher is needed to provide vacation/sick leave relief. This is demonstrated in the staffing and shift schedule for the Sumter, South Carolina shared communications system presented in Exhibit 4.6.

The labor demand for supervisory personnel can be based on the total number of employees needed. An organization can set a standard ratio of 1 supervisor per 5 employees. In the earlier case where the shared communications system needed 26 operators in 1983, a ratio of 1 supervisor per 5 employees would mean that the system also needs about 5 supervisors. If the system decides that a flat 1 supervisor per shift is required, it would have to hire at least 4 supervisors (7 days per week x 3 shifts per day = 21 shifts ÷ 5 shifts per supervisor per week = 4 supervisors). More realistically, however, 5 supervisors would be required since vacations and other "down time" have to be considered.

In an effort to reduce supervisory costs, the Northwest Central Dispatch System replaced two of its five supervisor positions with "lead telecommunicators." The lead telecommunicators would, in addition to their regular duties, coordinate activities in the absence of a regular supervisor on the shift. They would receive differential compensation for their increased responsibility at the rate of $35 per month. A cost analysis determined that this revised supervisory staffing arrangement would cost less than retaining five regular supervisors.

Exhibit 4.5

FORECASTING DEMAND FOR COMMUNICATIONS OPERATORS

YEAR	1983			1984		
SHIFT	8 am-4 pm	4 pm-12 am	12 am-8am	8 am-4 pm	4 pm-12 am	12 am-8 am
SERVICE DEMAND						
1. Avg. no. of calls for service per shift	500	1,000	800	550	1,000	810
2. Avg. person hours required per call	.05	.05	.05	.05	.05	.05
3. Total person hours per shift (#1 x #2)	25	50	40	27.5	50	40.5
4. Total person hours per year (#3 x 365)	9,125	18,250	14,600	10,037	18,250	14,782
LABOR AVAILABILITY						
5. Total person hours per operator	1,600	1,600	1,600	1,600	1,600	1,600
LABOR DEMAND						
6. Total number of operators needed per shift (#4 ÷ #5)	5.7	11.4	9.1	6.3	11.4	9.2
7. Total number of operators needed		26.2			26.9	

Exhibit 4.6

STAFFING AND SHIFT SCHEDULE
(Sumter, South Carolina)

STAFFING AND SHIFT SCHEDULE
INFORMATION SECTION
SUMTER POLICE DEPARTMENT

	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Supervisor[1]							
Dispatcher A	8am-4pm	8am-4pm	8am-4pm	8am-4pm	8am-4pm	DO	DO
Dispatcher B	4pm-12m	4pm-12m	4pm-12m	DO	DO	4pm-12m	4pm-12m
Dispatcher C	12m-8am	DO	DO	12m-8am	12m-8am	12m-8am	12m-8am
Dispatcher D	DO	12m-8am	12m-8am	4pm-12m	4pm-12m	8am-4pm	DO
Dispatcher E[2]		DO	DO				

[1]Information Section sergeant or civilian supervisor should work the second shift with Saturdays and Sundays off.

[2]Dispatcher E should be used primarily as vacation-sick leave relief for both dispatchers and records clerks. When not relieving personnel, he should be utilized as an extra information processor during periods of peak workload.

3. Inventorying and Projecting Employee Availability. After the demand for employees has been projected and management knows how many positions of various types it needs to fill, the next step in employment planning is to analyze the supply of personnel available to fill those positions. Availability considers two sources of human resources: external (available in labor markets) and internal (available within the organization). Both these sources are analyzed on several factors, including the numbers of people available as well as their skills, knowledge, abilities, and work experiences. The analysis involves taking inventory of the current supply of available personnel as well as projecting the current availabilities into the future.

For most shared communications systems, it is fairly easy to know how many employees there are, what they do, and what they can do. When management sees that a communications operator is going to graduate from college and take a new job in June, they know they need a replacement. Sources of supply could include current operator-trainees, qualified applicants who were rejected the last time the system hired for the position, or calling the state employment bureau for candidates.

The methods for documenting employee availability range from simple records on 3x5 cards to sophisticated mathematical techniques. The larger the organization, the more likely it will need advanced techniques to keep track of its many employees.

Internally, the major tool for analysis of the supply of job candidates is a skills inventory. A skills inventory in its simplest form is a list of the names and key characteristics of the people working for the organization, including:

- position
- years in position and in system
- special skills
- age
- sex
- EEO group
- wage level

- performance record
- education and training.

If the position of operations manager becomes vacant, for example, management can review the skills inventory to determine if anyone inside the organization has the requisite education, experience, and other qualifications before going outside to recruit for the position.

Because of retirement, turnover, and expansion, organizations cannot rely solely on internal sources of supply and must turn their attention to external labor markets to fill current and projected vacancies. Very rarely does a shared communications system have either the resources or expertise to develop this external labor market information on its own. One source of information can be personnel specialists in the member jurisdictions with experience in recruiting similar types of personnel, e.g. a police department that recently advertised for new dispatchers. The sharing arrangement in Sumter, South Carolina relies on the city planning department for employment data as well as on a law enforcement planner in the regional council of governments. A second source is the Bureau of Labor Statistics for the U.S. Department of Labor which publishes extensive statistics on a variety of occupations organized by metropolitan area. The Bureau of the Census also provides information on occupational markets. A third source is the many business and government organizations that have built models for gathering and projecting external labor resources, e.g., the Bell Telephone System has designed models that use census data to project available supplies of various occupational groups within specified areas. Given the emphasis of shared communications systems on communications operators and other telecommunications specialists similar to those employed by "Ma Bell," these models might be particularly apropriate.

4.3 Recruitment

Recruitment seeks to identify and attract job applicants with the necessary knowledge, skills, abilities, and motivations to fill vacancies identified in employment planning. For a shared communications system,

recruitment serves three functions: (1) to generate the largest possible applicant pool from which to select new employees, (2) to discourage and screen out obviously unqualified applicants, and (3) to inform prospective employees about the organization since the recruiting process is the primary source of information on which the applicant will base a decision to accept or reject an offer of employment.

A shared communications system has several handicaps in its recruitment efforts. First, an agency supplier system is constrained by the often cumbersome personnel procedures of the supplying jurisdiction that require internal clearance of job postings, competitive examinations for every position, maintenance of the employment register (i.e. list of eligible applicants) for a fixed period of time before recruiting again for the same position, and limited funds for employment advertising and outreach. Second, government employment has always had a negative image due to popular misconceptions about political pressures, corruption, and incompetence.* Adding the growing fiscal pressures on state and local governments from taxpayer initiatives like California's Proposition 13 and Massachusetts' Proposition 2-1/2 means that lack of job security has become another reason to avoid public employment.

Third, a substantial proportion of the work force of a shared communications system is composed of civilians whose high attrition makes recruiting more frequent. The attrition rate among civilians is exacerbated by several factors. In comparison to sworn officers, civilian dispatchers receive less pay for the same work and fewer career opportunities. In addition, sharing arrangements with effective training programs for their staff often lose them to non-member jurisdictions who are able to offer higher salaries for trained personnel. Another factor mentioned by survey respondents is that civilian dispatchers frequently accept the position in order to make the types of personal contacts that can lead to a more responsible job with one of the

*C.R. Tatro and A.P. Garbin, "Industrial Prestige Hierarchy," Journal of Vocational Behavior 3 (1973), pp. 383-391.

member police or fire departments. Finally, managers also reported that odd-hour shifts and high work stress associated with dispatching worsen the attrition problem.

The South Bay Regional Public Communications Authority experienced a 90% turnover in communications operators in 1980 and 50% in 1981. Even a concerted effort by the Northwest Central Dispatch System to increase the salaries of its operators still left it with an annual turnover rate averaging 30-40%. The negative effects of low pay and high turnover on recruitment and the stability of the work force are exemplified by the experience of South Bay. In response to an advertisement in a local newspaper, 100 persons applied for positions as communications operators. However, the quality of the applicants was so poor that only 30 could pass the aptitude test and 10 could pass the subsequent typing test. Of these 10, all were offered employment but only 8 accepted. Within six months, only 2 remained on the job (or 2% of the original applicant pool).

This section examines three issues with respect to the recruitment function in shared communications systems: (1) sources of applicants, (2) equal employment opportunity considerations, and (3) use of civilians versus sworn officers in communications.

4.3.1 Sources of Applicants

Once the shared communications system has decided it needs additional employees, it is faced with two recruiting decisions: where to search and how to notify potential applicants of the positions. Two sources of applicants are used: internal (present employees) and external (those not presently affiliated with the organization). Whether the system elects to stay inside or go outside for applicants depends on many factors, including the nature of the position for which applicants are sought, number of qualified applicants in both sources, local economic conditions, rate of organizational growth or decline, EEO concerns, and relative costs.

There are three sources of internal recruits: job postings, skills inventories, and referrals from higher level managers. Job postings allow current employees to apply for other positions in the organization by respond-

ing to announcements (postings) of openings. This technique is widely used for clerical and technical positions because of its implicit openness and fairness and because it promotes affirmative action by enabling all employees, including EEO-protected groups, to nominate themselves for positions for which they consider themselves qualified. Skills inventories, as defined in the previous section on employment planning, allow the organization to identify current employees with the proper mix of education, experience, and capabilities for specific position vacancies and to invite the most promising to apply. Referrals from higher level managers are based on observed job performance and provide an incentive to employees to work harder in order to get ahead. However, referrals may not be acceptable on affirmative action grounds since this source tends to perpetuate the present racial and/or sexual composition of the work force.

Obviously, shared communications systems must recruit outside for most entry-level jobs such as communications operators, communications technicians, and computer analysts. External recruitment also brings in "new blood" with new perspectives and, with experienced applicants, avoids excessive training and orientation costs. In addition, unmet EEO goals are an impetus to external recruiting since personnel with the required qualifications or the required race and sex may not be available internally. On the other hand, an external recruitment policy leads to relatively larger expenditures on recruiting, selection, and initial compensation since the organization may have to offer higher initial pay rates to attract experienced employees from other communications systems.

Sources of external applicants will vary according to the types of jobs to be filled. Jobs can be divided into three classifications: (1) technical and clerical jobs, such as communications operators, technicians, bookkeepers, and secretaries, (2) management trainees and professional employees, such as personnel and finance administrators, and (3) experienced managers who are most often recruited for general manager positions in joint powers arrangements.

- Sources of Technical and Clerical Applicants include:
  - public employment agencies
  - newspaper classified advertising
  - commercial employment agencies
  - union hiring halls
  - trade schools and junior colleges
  - referrals from present employees
  - unsolicited applications ("walk-ins")
- Sources of Management Trainees and Professional Employees include:
  - colleges and universities
  - professional societies
  - newspaper classified and display advertising
  - professional placement agencies
- Sources of Experienced Managers include:
  - industry contacts
  - executive recruiting firms
  - newspaper display advertising
  - professional societies

A 1979 survey by the Bureau of National Affairs found that personnel executives consider newspaper advertising as the single most effective source for all occupational groups. For technical and clerical applicants, the next most effective sources were unsolicited applications and referrals from present employees. "Word of mouth" seems to be an especially productive source of unsolicited applications for shared communications systems. System employees and police/fire officers tell their friends and neighbors when positions are vacant. Both the agency supplier arrangement in Forest Hills, Pennsylvania and the independent authority in South Bay reported that word of mouth was among the best sources of applicants. The shared communications system in Sumter, South Carolina recently used it to generate 15-20 applicants for several vacant operator positions.

4.3.2 EEO Considerations

The Federal government requires reports on recruiting and hiring practices in order to assure that current decisions and practices enhance the employment opportunities of members of protected groups: racial minorities, women, handicapped, etc. Organizations must keep extensive records on: use of various recruitment sources, placement of recruitment advertising, and

number of applicants processed by category (sex, race) and by job category and level. Such procedures apply to all private and public organizations that have contracts with or grants from any agency of the Federal government in excess of $10,000 under the provisions of Executive Order 11246 (1965) and Executive Order 11375 (1967). Many state and local governments have passed similar statutes.

Of course, job descriptions and specifications cannot be written so that jobs are sex stereotyped. And, recruiters must avoid asking applicants for certain types of personal information that may discriminate or do not relate directly to job performance, e.g. birthplace, religious affiliation, marital status, age, etc.

Shared communications systems may be required to recruit qualified employees from certain protected classes not well represented in current employees. For example, many systems have women overrepresented in clerical and technical jobs and underrepresented in management positions. They may be required to advertise in publications oriented towards women, recruit in professional women's associations, and take other "affirmative actions" to increase the percentage of women in management ranks.

4.3.3 Use of Civilian and Sworn Officers

The use of civilians in jobs normally performed by police officers has increased rapidly in recent years as police departments have sought to reduce costs and put more sworn officers "on the street." Shared communications systems employ particularly large numbers of civilians in all positions at all levels. Indeed, 62% of the sharing arrangements contacted in the telephone survey reported that they employed civilians exclusively; 23% used civilian dispatchers and sworn supervisors; and only 15% used sworn staff alone. The use of civilians is not an issue in managerial and technical positions since few would argue that sworn officers are necessarily better supervisors, computer technicians, personnel or finance specialists, or operations managers. However, the use of civilians as communications operators is more controversial since their dispatching function brings them into daily contact with sworn officers in police and fire units and many sworn officers

feel that the civilians' law enforcement knowledge and dispatch skills are far inferior to their own.

The major advantages of using civilians as communications operators include lower salary and training costs than sworn officers and the capacity to relieve sworn officers for more important duties. Police departments contacted in a 1975 survey by The Urban Institute reported that the use of civilians (as communications operators and in identification and detention) reduced per capita salary costs by 23% and saved 96% in training costs.* In addition, most respondents felt that the use of civilians relieved officers from such routine tasks as dispatching patrol cars and increased the amount of uniformed manpower available for more active law enforcement duties.

The problems associated with civilian communications operators include a high attrition rate, lack of job knowledge and experience in law enforcement, and the pervasive anxiety of sworn officers about the civilians' reliability in emergency situations. Respondents to The Urban Institute survey reported that civilians had an attrition rate as high as 100% or more per year, possibly due to low pay, poor training, and inadequate job security. As mentioned previously, high attrition of communications operators is a substantial problem for shared communications systems.

However, the most significant concern with civilian operators tends to be their lack of job knowledge and unreliability in emergency situations. This was confirmed by the survey and site visits conducted in preparation of this report where "horror stories" abounded about civilian operators sending the wrong units to the wrong addresses for the wrong reasons at the wrong time. Yet one police chief in California observed that "my men exaggerate the mistakes made by the civilian dispatchers and forget how bad it was when sworn officers were the dispatchers." To prove his point, the chief continued:

> I have a letter from an official in one of the member jurisdictions in the authority complaining about the dispatchers' poor telephone manner and frequent dispatching errors. When-

*National Institute of Law Enforcement and Criminal Justice, Employing Civilians for Police Work.

ever I show this letter to a police officer who is insisting that the civilians be replaced with sworn personnel, he quickly nods his head and says 'See what I mean?' Then I uncover the date of the letter--1973--when we did not have any civilians and sworn officers were doing all the dispatching!

The Urban Institute Report concluded that the benefits of using civilians exceeded the costs but advised jurisdictions considering a civilian recruiting program to:

- establish general policies for utilizing civilians, including goals and objectives for using civilians, specification of appropriate and inappropriate tasks for civilians, and limits on the number of civilians to be hired;
- conduct a feasibility analysis for using civilians that considers issues such as whether the use of civilians conflicts with established laws or policies, availability of qualified civilians in local labor market, and comparative costs of civilians versus sworn officers for the same position; and
- conduct on-the-job and classroom training for new civilian hires that gives them a working knowledge of police work and the technical aspects of their own jobs, including riding on patrol, meeting with police and fire officials on a regular basis, and simulations of conditions they will actually face on the job. (The worth of training was demonstrated by the telephone survey results which showed that member jurisdictions of shared communications systems with formal training programs for civilian staff had few or no complaints about the quality of service.)

4.4 Selection

Through the selection process, organizations choose the person or persons from among those recruited who best meet the selection criteria for the position available, given current environmental conditions. In this process, information on the applicant is gathered from a variety of sources and evaluated. The most important consideration in the accept-reject decision is anticipated job performance, but EEO goals, expected "fit" with current employees, and the likelihood of acceptance of the job offer also play a role in the decision.

If the selection program is to be successful, the personal qualifications believed necessary for effective performance on the job should be specified. The qualifications have to be job-related not only because that makes the person selected a more effective employee but also because qualifications that are not job-related violate equal opportunity statutes. And, to insure their job-relatedness, the qualifications should come from the job descriptions developed as part of the employment planning process.

Selection qualifications or criteria can be summarized in several categories:

- Education: is the amount and types of formal education. Among the specific educational criteria that employers examine are number of years of education, diplomas and degrees awarded, major fields of study, and grades.
- Experience: is the amount and types of work that applicant has done relevant to the position sought. Criteria in the experience category include total length of work experience, prior occupations, jobs, and specific work activities, senority in present job, special achievements, length of time unemployed, supervisory responsibilities (if supervisory position sought), and salary history.
- Knowledge, Skills, and Abilities. Knowledge is an accumulation of data on job-related topics and is a prerequisite to skills, or the ability to use that knowledge effectively on-the-job. Abilities are similar to skills but include native intelligence and aptitude.
- Personal Characteristics. These include physical characteristics and personal qualities such as appearance and sociability. Employers have to use extreme care in using personal characteristics in selection decisions because they will violate EEO guidelines if not demonstrably job-related. Among the personal characteristics most likely to be illegal if used as selection criteria are: age, marital status, nationality, and birthplace.

Once the selection criteria are specified for a particular job, the next step is to design a selection process that will result in persons being hired who meet those criteria. All organizations make selection decisions, and most make them informally, at least in part. The smaller the organization, the more likely it is to take an informal approach to selection decisions. For example, the relatively small sharing arrangement in Forest Hills has a selection process for operators that has been characterized as "the chief hires and fires." Yet, a formal selection procedure may increase the proportion of successful employees chosen and it helps to insure that hiring criteria are work-related. The Northwest Central Dispatch System (NWCDS) uses a wide range of tests, simulations, and interviews to make its selection choices.

The selection process is usually perceived as a series of steps through which job applicants pass. At each step, more applicants are screened out or drop off the applicant list. Exhibit 4.7 illustrates a typical selection process. This report focuses on one step in the process most crucial for a shared communications system: employment tests.

Employment Tests

Such a test is a mechanism (either a paper-and-pencil test or a simulation exercise) which attempts to measure job-related characteristics of individual applicants. Because tests are thought to be more objective than other selection tools (particularly the employment interview), they are widely used in the public sector. Tests are used most frequently for clerical jobs (typing tests) and, in shared communications systems, for experienced communications operators to determine their telephone skills and familiarity with the equipment.

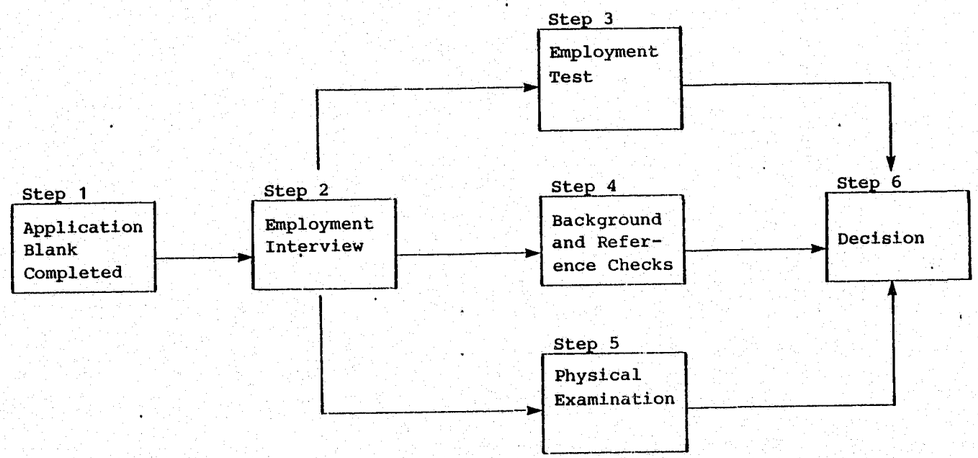
To be acceptable, a test must be job-related and valid. Validity in a test is the extent to which it is a good indicator or predictor of success for the selection criteria in question. For example, applicants who score the highest on a test for communications operators should also turn out to be the best employees, if the test has perfect validity. Few tests reach this level of predictability but the example does convey what validity entails. Many references are available for readers interested in greater detail on test validation methodology.*

Written standardized tests of knowledge, skill or ability typically are low cost and moderately valid. These tests can be obtained from local personnel departments, test publishers, and standard textbooks and should be accompanied by data showing where each test was used previously and how valid it has proved to be. However, the test may have to be re-validated each time it is used in a new context. Standardized tests are not used on applicants

*For example, see: Robert Guion, Personnel Testing (New York: McGraw-Hill, 1965); Norman Gronlund, Measurement and Evaluation in Teaching 3rd Edition (New York: Macmillan, 1976).

Exhibit 4.7

TYPICAL SELECTION PROCESS



for managerial positions since experience and performance in the employment interview are much more important factors in their selection.

Simulation tests (e.g. in-basket exercises where the candidate is asked to respond to a pile of hypothetical memoranda) and assessment centers in which prospective managers are given various problem-solving exercises and observed over a 3-5 day period are used more frequently. They have higher validity than written tests with respect to managerial selection but also have higher costs.* In its selection process for operators, the Northwest Central Dispatch System asks job applicants to listen to tapes of actual radio transmissions and phone conversations in order to evaluate how each applicant would react in various situations:

- A person complains to the dispatcher about speeding cars in his neighborhood. The caller is very obnoxious and uses obscene language. Applicants are asked to rate how well the dispatcher handled the call.
- A police officer is shot and loses consciousness while on the phone with the dispatcher. Again, applicants evaluate how well the dispatcher handled the call. Some applicants have actually lost their composure while listening to the tape recording.
- Someone calls in to report a stolen bike. The applicant fills out the complaint card as the dispatcher elicits pertinent information from the caller. Not only are applicants evaluated on how much information they record accurately but also on the legibility of their handwriting.

The Association of Centralized Communications Directors in Illinois surveyed large and small shared communications systems to determine typical testing processes for telecommunicators. The processes studied and subsequently recommended by the Association seemed to have two phases. Phase 1 is handled by the sharing arrangement and consists of a battery of language and perception tests. The aim of Phase 1 is to identify the better job candidates by administering:

- Language Usage Test: measures the applicants' ability to read, write, speak, and understand English. In an area with bilingual population, a second language test may be necessary.

*"Personnel Research Roundup," Civil Service Journal 17:4 (April-June, 1977), p. 22.

- Situational Exercise: provides the applicant with a realistic emergency situation in order to test common sense and the ability to treat a threat to life more seriously than a threat to property.
- Listening Ability Test: measures whether the applicant hears well and can act on and assimilate the information heard.
- Color Blindness Test: used in systems where color coding is used to locate patrol units and in other ways.

If the candidate is successful in Phase 1, he/she is sent to an outside testing agency for Phase 2 which consists of mental ability and aptitude tests. Retaining an outside agency to administer these tests is more expensive than testing in-house but the Association feels that the sophistication of the tests in Phase 2 require special expertise. The costs of Phase 2, however, are reduced by only testing the better candidates since the less qualified candidates were screened out during Phase 1.

The mental ability test in Phase 2 measures common sense reasoning skills, visual perception and alertness, ability to comprehend verbal instructions, and ability to adapt to unexpected situations when placed under pressure. The aptitude test assesses self-control and maturity, emotional stability, self-confidence, ability to maintain composure under pressure, and social skills. A total score of 70 on both tests is passing.

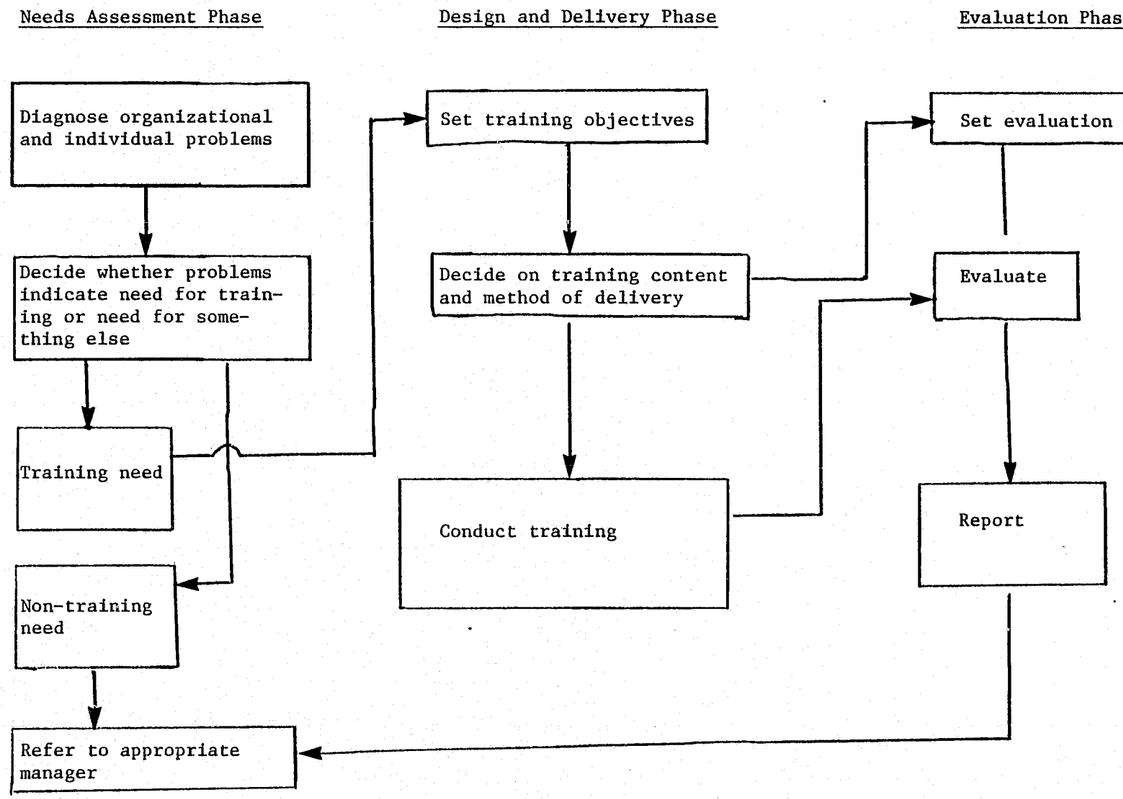
4.5 Training

Training is a systematic process of altering the knowledge, skills, job performance and/or attitudes of employees to increase organizational goal achievement. Some shared communications systems place greater emphasis on formal training than others. For example, the Forest Hills system offers no formal training to its communications operators but relies instead on informal orientation and on-the-job coaching by experienced personnel. On the other extreme, the South Bay Public Communications Authority insists that its operators and dispatchers participate in 80 hours of classroom training, 440 hours of on-the-job training, and regular "ride alongs" with police patrol units.

Exhibit 4.8 displays the major steps in the training and development process. It suggests that training has to be based on carefully assessed

Exhibit 4.8

TRAINING DEVELOPMENT PROCESS



organizational and individual needs. Training must also relate to the characteristics of the trainees and organizational constraints. Finally, training has to be evaluated in order to determine if the needs that originally promoted the training effort have been met.

1. Determine training needs. While training is done for a variety of reasons, the need for training must be documented before designing and delivering a program. Existence of certain training needs can be accepted on the basis of common sense, without extensive surveys or analyses. Training of some kind (formal or informal; simple or complex; by fellow employees, supervisors or other) is a practical necessity, for example, whenever: a new employee comes to work; an employee is assigned to a new or different job; the methods for doing an existing job are changed; or major changes occur in organizational structure, procedures, or reporting relationships.

The need for training dispatchers is critical not only to the effectiveness and survival of the sharing arrangement as mentioned earlier, but more importantly to the safety of police and the public. Dispatchers must be able to handle criminal, fire, medical, and other emergencies both effectively and efficiently. Without adequate training, dispatchers have sent police into hazardous situations without backup, misdirected fire trucks and ambulances, and failed to obtain the location of crime victims. The manager of one shared communications system highlighted the importance of dispatcher training by relating a tragedy in a neighboring metropolitan area:

> A frantic woman called and stated that someone was breaking into her house. The dispatcher kept the woman on the line with a laundry list of irrelevant questions. By the time the woman finally dropped the phone and ran, it was too late--she was shot in the back while fleeing out the front door. A replay of the dispatch tape indicated both incompetence and a clear lack of training. We know they weren't training their people, and it was only a matter of time before something like this happened.

With proper training, a dispatcher would know how to expedite a call and send police to a crime scene within seconds. In addition, a trained dispatcher can give life-saving medical advice pending the arrival of the ambulance and forewarn officers with continuous updates on crimes in progress. As one dispatcher put it: "Those guys on the street are my friends, and their lives depend on how well I do my job. I know it, and they know it."

Other training needs are not as obvious. A problem may not be apparent, or its severity may be in dispute. Fluctuations in productivity may require management attention or be a temporary aberration. In a shared communications system, there may be many opportunities for effective training interventions which need further analysis:

- Even though there have been no new hires for the last two months, the number of dispatching errors has been increasing at an alarming rate;
- Equipment repairs take too long and even when they are completed are often not done properly;
- The second shift has been experiencing high turnover and excessive sick leave among its communications operators; and
- The computer budget is being depleted much faster than expected but the senior computer analyst seems oblivious to the problem.

To the extent that these problems involve deficiencies in the knowledge, skills, job performance or attitudes of employees, the system has a need which training can probably meet. The managers concerned will have to judge if training is the best way to meet it. This is an important point. Training is only one of many management strategies. McGehee cautions that the "appearance of a discrepancy in job performance is not necessarily symptomatic of a training problem and should only be the beginning of analysis to see what the nature of the problem is...Performance discrepancies occur for many reasons other than lack of skill or knowledge."*

For example, the increased rate of dispatching errors cited above may be due to lack of job knowledge or proper motivation on the part of the communications operators. But the problem may also be due to new dispatch procedures that are unclear or equipment malfunction. The problem of high turnover and excessive sick leave among communications operators might signal a need for motivation training for the operators or management training for an especially ineffective communications supervisor. On the other hand, the

*William McGehee, "Training and Development Theory, Policies, and Practices," in D. Yoder and H.G. Heneman, Jr. (eds.), ASPA Handbook of Personnel and Industrial Relations (Washington, D.C.: Bureau of National Affairs, 1979), pp. 5.1-5.4.

problem might also be caused by low pay, poor working conditions, stress, or a spreading recognition that being a communications operator in that system is a dead-end job. These problems cannot be solved by training alone, although training might make top management or member jurisdictions more aware of the problem.

2. Design and Deliver Training. When training needs have been identified and agreed upon, it is time to consider training objectives, content, and methodology. This report will deal with these topics only in passing, for there exist many "how to" books for the training function.*

The formulation of proper training objectives is a topic worth considering here, for it is often difficult to make the transition from needs assessment results into useful objectives to guide the content of a training program. The objectives must be relevant to the training needs and be stated in such a way that the success or failure of the training program can be measured. For example:

NEED:	The increased rate of dispatching errors is due to improper handling of complaints by the operators. In particular, they do not accurately record the nature or location of the incident.
OBJECTIVES:	By the end of the training program, 100% of the operators will know the telephone procedures designed to ascertain the nature and location of complaints.
	By the end of the training program, 100% of the operators will be able to use proper telephone procedures in a simulated complaint intake exercise.
	Within two months after the end of training, the dispatching error rate will decrease by 50%.
	By the end of the training program, 100% of the operators will know how to record the essential information about the nature and location of selected incidents.

*For example, see: L.N. Davis and E. McCallon, Planning, Conducting, Evaluating Workshops (Austin, Texas: Learning Concepts, 1974); R.L. Craig (ed.), Training and Development Handbook 2nd Edition (New York: McGraw-Hill, 1976).

Such information indicates the target group for the training, intended outcomes of training, and a deadline by when the outcomes must be realized. It provides a firm basis on which to evaluate the impact of the training.

Objectives also govern the choice of training content and method. Obviously, an objective to improve dispatching accuracy calls for a different content and method than an objective to reduce response time. Also, management development objectives will prompt different training approaches than operational improvement objectives.

In many situations, an employee's supervisor can be very helpful in constructing a training experience which best fits the needs of the individual. This experience may take the form of on-the-job coaching, extra practice in areas of difficulty, or group meetings. Self-instruction may also be recommended by the supervisor. For example, Northwest Central Dispatch System has a detailed operations and procedures manual which serves as a training aid and reference book for new employees. Employees are required to sign their names after each chapter in the manual certifying that they have read and understood the material.

Often, the sharing arrangement will send its employees away for training at a regional or state training center rather than try to offer this training itself because training needs are sporadic, and the start-up costs of an in-house training capability would be prohibitive. For example, the communications sharing arrangement in Sumter, South Carolina sends its dispatchers to the State Police Academy for a four-day course during their six month probationary period. Likewise, the Northwest Central Dispatch System sends its dispatchers for a five-day course conducted by communications specialists of the Association of Centralized Communication Directors. Exhibit 4.9 contains a topic agenda for the course.

At the management level of a shared communications system, the training needs (and appropriate content and methods) will be more variable. Prior experience will resolve some potential training needs for some managers. Additionally, the management level influences the choice of training approach. General managers, for example, often need training in governmental relations (especially with executives and legislators), external reporting, and other

Exhibit 4.9

BASIC PUBLIC SAFETY TELECOMMUNICATIONS
TRAINING AGENDA

DAY	TIME		TOPICS
FIRST DAY	8:00 - 11:30 AM	I.	HISTORICAL DEVELOPMENT OF PUBLIC SAFETY COMMUNICATORS
			A. Technological Overview
			B. Telecommunications Today--Types of Systems (police, fire, ambulance)
			C. Overview of Public Safety Communications Center
		II.	THE PUBLIC SAFETY TELECOMMUNICATOR
			A. Philosophy and Definitions
			B. The Communication Process
			C. Art of Effective Listening
			D. Dispatcher Goals: The Career of Dispatching
			E. Professional Responsibilities of Telecommunicators
	12:30 - 5:00 PM	III.	CHARACTERISTICS AND TRAITS OF TELECOMMUNICATORS
			A. Job Knowledge, Skill, Aptitudes and Attitudes Necessary to Perform the Telecommunications Role
			B. Inter and Intra Agency Relationships Between Communications Center and Field Personnel
			C. Public Relations Responsibilities
			D. Telecommunication Center Personnel Policies, Rules and Regulations
			E. Criteria for the Evaluation of Telecommunicator's Job Performance
		IV.	THE MANAGEMENT OF STRESS
			A. Definition and Explanation of Stress
			B. Stress Factors Inherent in Public Safety Emergencies
			C. Review of Stress Related Diseases, Disorders and Addictions
			D. Keeping Your Cool (positive and negative ways of handling stress)
SECOND DAY	8:00 - 11:30 AM	V.	TELEPHONE TECHNIQUES AND INFORMATION GATHERING
			A. Personalizing Telephone Contacts
			B. Essential Facts in Processing or Relaying a Telephone Contact
			C. Relaying Alternatives (written message with follow-up, telephone message, personal contact, etc.)
	12:30 - 5:00 PM	VI.	PERSONAL CONTACTS
		VII.	DOCUMENTATION
			A. Complaint Taking and Recording
			B. Logging Techniques
			C. Message Dissemination and Routing
THIRD DAY	8:00 - 11:30 AM	VIII.	LEADS SYSTEM OVERVIEW (statewide law enforcement data base)
			A. Identification and Definition of System Components
			B. Types of Information in LEADS Files
			C. Law Enforcement Teletype System
			D. Identification and Definition of LEADS"Support Systems"
			E. Interfaced System with NCIC
		IX.	LEADS REGULATIONS
			A. Data Dissemination
			B. Hot File Maintenance
			C. Operating Regulations
			D. Non-Compliance Recourse
		X.	PRESENTATION OF THREE BASIC LEADS FUNCTIONS
			A. Inquiries
			B. Point to Point Message Switching
			C. Record Entry and File Maintenance
		XI.	RESPONSE INTERPRETATION EXERCISES
			A. Driver's License Checks
			B. Registration Inquiries
			C. Hot File Responses
			D. "Soundex" Filing System
			E. Legal Responsibility in Hit Processing
		XII.	COMPUTERIZED AND MANUAL CRIMINAL HISTORY INQUIRIES
			A. Demonstration of Correct Procedures in Making "On Line" and "Off Line" Criminal Records Check
			B. Criminal Records Checks on Interstate Basis
			C. Dissemination Limitations
			D. Overview of Persons/Groups Eligible to Receive Criminal History Information
	12:30 - 5:00 PM		(LEGAL TRAINING FOR TELECOMMUNICATOR)
		XIII.	CIVIL LAW--DEFINED
			A. Municipal Ordinance Violations
			B. Law Enforcement's Role in Civil Law Enforcement
			C. Identification of Civil Law Enforcement Powers (Municipal Police, County Sheriff)
			D. General Discission of Individual Agency Policy in Civil Law Enforcement
		XIV.	CRIMINAL LAW--DEFINED
			A. General Definitions (felony, forcible felony, misdemeanor, etc.)
			B. Use of Force
			C. Specific Crimes (murder, kidnapping, sex offenses)

DAY	TIME		TOPICS
THIRD DAY (continued)	12:30 - 5:00 PM (continued)	XIV.	CRIMINAL LAW DEFINED (continued)
			D. Personal Crimes
			E. Property Crimes
			F. Deception
			G. Robbery
			H. Burglary
			I. Arson
			J. Criminal Trespass and Damage to Property
			K. Disorderly Conduct
			L. Official Misconduct
		XV.	TRAFFIC LAW DEFINED
			A. Enforcement Powers
			B. Special Areas (accidents, alcohol and reckless)
			C. Traffic Law and Relationship to Civil Liability
		XVI.	SPECIAL LEGAL AREAS
		XVII.	LIABILITY
			A. Municipal Liability
			B. Vicarious Liability
			C. Examples
		XVIII.	SUMMARY
FOURTH DAY	8:00 - 11:30 AM	XIX.	DISPATCH TECHNIQUES
			A. Description of Radio Systems for Public Safety
			B. Explanation of Radio Frequencies
			C. Base Station Controls
			D. Communication Practices
		XX.	DISPATCHING ASSIGNMENTS
			A. Transferring Telephone Complaints to Radio Calls
			B. Using Radio Call-Up Procedures
			C. Using APCO or Local Ten Codes
			D. Using APCO and International Alpha Codes
			E. Numerical Pronunciations
			F. Dispatcher's Vocabulary
			G. How to Describe People for Radio Broadcast
			H. How to Describe Vehicles for Radio Broadcast
			I. Special Communication Procedures
		XXI.	RADIO NETWORK DISCIPLINE
	12:30 - 5:00 PM	XXII.	FCC RULES AND REGULATIONS
			A. Twelve Most Violated FCC Rules
			B. FCC Field Office Information
			C. Station Licensing/Frequency Coordination
			D. Legal Responsibilities
		XXIII.	SPECIAL EMERGENCY NETWORKS (state police, fire emergency, etc.)
		XXIV.	SPECIAL DISPATCHING TECHNIQUES
			A. Transferring Telephone Reports into Radio Messages
			B. Differences between Dispatching Calls of Law Enforcement Service and Fire and Emergency Medical
			C. Discussion of Fire and Ambulance Apparatus
		XXV.	EMERGENCY COMMUNICATION PLANS/DISASTERS
			A. Organizing for External Disasters (airplane crashes, train wrecks)
			B. Organizing for Internal Emergencies (back up radio base station, power)
			C. Mutual Aid
		XXVI.	ALARM MONITORING SYSTEMS FOR BURGLAR & FIRE
		XXVII.	911 EMERGENCY TELEPHONE SYSTEM
		XXIX.	COMMUNICATION EQUIPMENT OF THE FUTURE
			A. Recorders
			B. Computer Aided Dispatch
			C. Devices for Deaf and Mute
			D. In-Car Computer Terminals
FIFTH DAY	8:00 - 11:30 AM	XXX.	FUNCTIONAL AREA-METHODS, SKILLS, FUNCTIONS
			A. Handling Simulated Situations (ambulance contacts, officer back-up)
			B. Identifying Available Resources
			C. Notification Requirements
	12:30 - 5:00 PM	XXXI.	FUNCTIONAL AREA-SIMULATION
			A. Simulated Proficiency (telephone, radio, documentation etc.)
			B. Individual Assessment

Adapted from: North East Multi-Regional Training, Inc., Basic Public Safety Telecommunications: Training Program (Aurora, Illinois: 1983).

policy level responsibilities. Middle and first line managers are more likely to need training in technical aspects of their jobs, citizen/police relations and in managing people. These different needs are reflected in the training content areas and methods suggested in Exhibit 4.10.

3. Evaluate training. To be justified, training must demonstrate an impact on the performance of the trainees. Too often, training is done without any thought of measuring and evaluating how well the objectives are accomplished. Yet training evaluation is a management tool. It provides a basis for better program decisions and more rapid responses to needs for improvement. Because training is both time consuming and costly, evaluation should be built into every training program.

Any training program can be evaluated at four levels:

- Reaction. How well did the trainees like the training?
- Learning. To what extent did the trainees acquire the knowledge, skills, and attitudes that were included in training?
- Behavior. To what extent did their job performance change because of the program?
- Results. What final results were achieved? (reduction in dispatching errors, reduction in turnover, increase in telecommunications equipment service life, etc.)*

Reaction level evaluation can be measured by interviewing the trainees or by trainee questionnaires. The immediate reaction of trainees may measure how they liked the training rather than how it benefited them. Moreover, reaction level questionnaires often lead to unreliably favorable impressions of training because trainees tend to be too kind in completing them, either because they are grateful for any off-the-job experience or they liked the trainer personally even though they might have disliked his content or delivery.

Learning level evaluation measures how well trainees have acquired the knowledge, skills, and attitudes for which the training was designed. Knowledge tests, observations of skill utilization, and questionnaires/interviews for attitudes are commonly used for evaluating learning. These instruments

*Adapted from: R.F. Catalnello and D.F. Kirkpatrick, "Evaluating Training Programs--The State of the Art," Training and Development Journal, (May, 1968), pp. 2-3.

Exhibit 4.10

TRAINING CONTENT AND METHODS AT VARIOUS MANAGEMENT LEVELS

LEVEL	EXAMPLE	CONTENT	METHODS
1. First Line Supervisors	Sr. Computer Systems Analyst Sr. Communications Technician	Technical duties Citizen and police relations Essentials of management-- leadership and motivation work scheduling communications reporting	Read basic textbook Take short course On-the-job coaching by superior
2. Middle Managers	Technical Services Manager Operations Manager Staff Department Managers with subordinates	Technical duties Citizen and police relations Theory and practice of management-- managing managers coordination and teamwork handling grievances planning and budgeting reporting recruitment and selection	Take semester course at local college or professional association Use lectures and case studies Use programmed learning text Joint programs with member jurisdictions or other sharing arrangements On-the-job coaching
3. Top Managers	General Manager Executive Director Police Chief (in agency supplier arrangement)	Governmental relations Theory and policy of management-- regulation setting multi-year programming and financial planning external reporting management development organizational and performance auditing	Refresher courses on management Meetings with other top managers Professional journals Job rotation within system (e.g. operator-for-a-day)

Adapted from: H. Koontz and C. O'Donnell, Management (New York: McGraw-Hill, 1976), pp. 520-526.

can be given both before and after training to compare scores and measure improvement.

Behavior level evaluation attempts to measure the effect of training on job performance. This is more difficult to evaluate than learning since the latter can be measured at the training site whereas behavior has to be measured on-the-job. Interviews with supervisors, trainees, and co-workers and observations of job performance are ways to evaluate training at the behavior level.

Evaluating training at the results level measures the effect of training on the needs that training was intended to address. Because results such as dispatching errors, turnover, response time, and other performance measures are more concrete, this type of evaluation can be done by comparing records before and after training. The problem with this measurement is the sometimes erroneous deduction that training produced the statistical difference when other factors may have been more influential. For example, a significant reduction in turnover might be due to a motivation training program or talk but a salary increase might have as great or even greater impact on turnover. Hence, it is important to be aware of the complexity involved in determining the exact effect of training.*

4.6 Compensation

Compensation is the major cost of operating a shared communications system. The Northwest Central Dispatch System expended almost 70% of its 1981-82 budget on personnel compensation whereas for the South Bay Regional Public Communications Authority, compensation consumed about 66% of the budget. Part of this compensation is paid directly to the employee in the form of salary or wages and part is paid indirectly in the form of fringe benefits (e.g., paid vacation, hospital insurance, etc.).

*Two general purpose textbooks on training evaluation are: Kent J. Chabotar and Lawrence J. Lad, Evaluation Guidelines for Training Programs (Lansing, Michigan: Midwest Intergovernmental Training Committee/U.S. Office of Personnel Management, 1974); T.L. Wentling, Evaluating Occupational Education and Training Programs, 2nd Edition (Boston: Allyn & Bacon, 1980).

Compensation for a particular position is usually set relative to three standards of equity:

- Internal equity. Employees working on a variety of jobs within the same organization;
- External equity. Employees working on similar jobs in other organizations; and
- Employee equity. Employees working on the same job within the same organization.

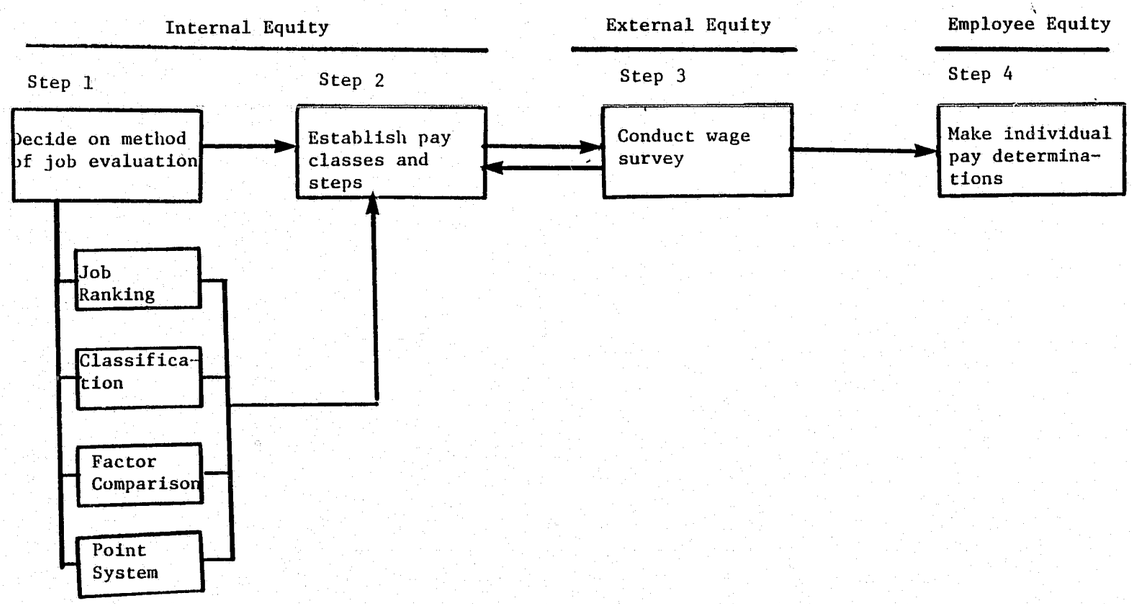
Exhibit 4.11 shows how these standards affect the steps in the compensation process. It provides a general introduction to the techniques used in deciding on compensation levels. It is designed to achieve the typical objectives of a compensation system: to attract and retain employees and to try to motivate them to perform in an effective and efficient manner.

1. Decide on method of job evaluation. Job evaluation is the formal process by which the relative contribution of various jobs in the organization is determined for pay purposes. Essentially, it attempts to relate the compensation paid for a job to the extent that the job contributes to organizational effectiveness. It is not always easy to evaluate the contribution of all the jobs in a shared communications system or any other type of organization. It may be obvious that the effective general manager will contribute more to the goals of the system than its senior communications analyst; the point at issue is how much the differential is worth.

There are several methods used to determine internal equity through job evaluation, including job ranking, classification, and the point system. Job ranking places all the jobs in an organization in order of relative "value," "complexity," or "contribution to organizational effectiveness." The job ranked the highest receives the highest pay, the job ranked the lowest receives the lowest pay, and jobs ranked in between are paid in relation to the two extremes. Whereas job ranking deals with individual jobs, classification ranks groups of jobs in the same manner, e.g., the least contributing jobs in the U.S. federal service are grouped into GS-1 and paid the lowest salaries. Both job ranking and classification entail subjective judgments of worth and are cumbersome to use when large numbers of jobs are involved. They also do not provide exact measures of the differences between ranks, e.g.,

Exhibit 4.11

COMPENSATION PROCESS



ranking individual jobs or groups of jobs #1 and #2 merely indicates that #1 is more valuable than #2, not how much more valuable.*

The point system is the most frequently used approach because it is more systematic and reliable than job ranking or classification. Basically, the point system requires evaluators to quantify the elements or factors in a job. It involves: (1) defining the 3-10 most important factors of each job, e.g. education required; (2) assigning a weight to each factor which reflects its relative importance to that job, e.g. education (25%); (3) awarding points to each factor based on the level of that factor that the job requires, e.g. education (100 points); (4) multiplying the points for each factor by the weight to determine a weighted score on each factor, e.g. education (25% x 100 points = 25 points weighted score); (5) summing the weighted scores on each factor to determine the overall score for the job. An example of the use of the point system in job evaluation is in Exhibit 4.12.

2. Establish pay classes and steps. The results of the job evaluation are used to establish pay classes and steps within each class. A pay class is a group of jobs of approximately equal worth in terms of responsibilities and requirements. For example, if the point system is used, any position with a weighted score up to 50 points could be assigned to Class 1; 51-100 to Class 2; 101-150 to Class 3, and so on. The higher the class, the greater its worth and the higher its compensation.

Although it is possible for a pay class to have a single pay rate, the more likely condition is to have a range of pay or "steps." These ranges can have the same spread or can increase the spread as the pay rate increases. For example, within Class 3 (101-150 points), there might be four steps:

Step 1:	$5.00-5.25 per hour
Step 2:	$5.26-5.50 per hour
Step 3:	$5.51-5.75 per hour
Step 4:	$5.76-6.00 per hour

*More detailed information about these and other job evaluation methods can be found in: W.F. Glueck, Personnel: A Diagnostic Approach 3rd Edition (Plano, Texas: Business Publications, 1982), pp. 468-476.

Exhibit 4.12

USE OF POINT SYSTEM IN JOB EVALUATION
(Non-Management Positions)

FACTOR	WEIGHT	POINTS AWARDED	WEIGHTED SCORE
Skill			
1. Education	.15	100	15.00
2. Experience	.20	50	10.00
3. Initiative and ingenuity	.15	50	7.50
Effort			
4. Physical demand	.10	75	7.50
5. Mental-visual demand	.05	125	6.25
Responsibility			
6. For equipment or process	.05	100	5.00
7. Material or product	.05	25	1.25
8. Safety of others	.05	25	1.25
9. Work of others	.05	25	1.25
Job Conditions			
10. Working conditions	.10	50	5.00
11. Hazards	.05	75	3.75
TOTALS	1.00		63.75

These steps in effect are money raises within a pay class to help take care of the needs of individual pay determination. Within class increases are typically based on seniority, merit, or a combination of both. Exhibit 4.13 shows the pay classes and steps used in 1981 by the South Bay Regional Public Communications Authority. The entire pay structure should be evaluated periodically to insure its conformity with prevailing wage rates, inflationary pressures, and labor market conditions.

3. Conduct wage survey. A prerequisite to construction of a rational pay structure and the maintenance of external equity is a knowledge of "prevailing rates of pay" in the general labor market. In order to attract, retain, and motivate its work force, a shared communications system must have a pay structure that is competitive with what other employers are offering for comparable work. A shared communications system that pays its operators $6 per hour when local police departments are offering $8 is likely to have a small and relatively unqualified applicant pool unless the system is able to offer incentives other than wages. On the other hand, a system offering $8 per hour for a job when the prevailing rate is $6 will not be competitive in terms of the fees it must charge for its services.

Smaller systems may have to rely for this information on published reports or the actions of nearby communities. Several sources for pay information are available including government surveys, trade associations, and consulting services. For example, employers in numerous communities participate in a wage survey sponsored by the Chamber of Commerce. This information may be useful for a shared communications system interested in getting started in that community. National surveys on many jobs and industries are available through the Bureau of Labor Statistics in the U.S. Department of Labor or through national professional organizations such as the American Management Association, American Management Society, and the American Compensation Association.

If the wage information the organization needs is not already available, the communications system can undertake its own wage survey. Larger systems and jurisdictions are more likely to have to conduct independent surveys of their own to supplement such sources. Recent surveys of compensa-

Exhibit 4.13

PAY CLASSES AND STEPS

(South Bay Regional Public Communications Authority)

SALARY CLASS	SALARY STEPS (MONTHLY AND HOURLY RATES) A	B	C	D	E
7	1158 6.6808	1216 7.0154	1277 7.3673	1341 7.7365	1408 8.1231
		Communications Operator - Trainee			
8	1187 6.8481	1246 7.1885	1308 7.5462	1373 7.9212	1442 8.3192
		Financial Administrator Personnel Analyst			
12	1308 7.5462	1373 7.9212	1442 8.3192	1514 8.7346	1590 9.1731
		Communications Operator			
13	1341 7.7365	1408 8.1231	1478 8.5269	1552 8.9538	1630 9.4038
		Executive Secretary			
14	1373 7.9212	1442 8.3192	1514 8.7346	1590 9.1731	1670 9.6346
		Computer Systems Analyst			
15	1408 8.1231	1478 8.5269	1552 8.9538	1630 9.4038	1712 9.8769
		Administrative Analyst			
21	1630 9.4038	1712 9.8769	1798 10.3731	1888 10.8923	1982 11.4346
		Communications Technician			
22	1670 9.6346	1754 10.1192	1842 10.6269	1934 11.1577	2031 11.7173
		Communications Supervisor Senior Computer Systems Analyst			
24	1754 10.1192	1842 10.6269	1934 11.1577	2031 11.7173	2133 12.3058
		Senior Communications Technician			
32	2133 12.3058	2240 12.9231	2352 13.5692	2470 14.2500	2594 14.9654
		Operations Manager Technical Services Manager			

*Effective May 9, 1981

tion practices have determined that over 92% of respondent firms complete some sort of survey analysis of the external labor market.* The standard practice in gathering pay data consists of the following tasks:**

- selecting a representative set of pay classes that typify major segments of the work force involved and are likely to be found in the outside market;
- writing brief descriptions of these classes that will help identify comparable classes in private or public employment;
- soliciting by questionnaire or personal visit the existing pay rates, pay schedules, work hours, and other relevant information for each of these classes from a representative sample of employers that hire substantial numbers of people in these categories. The personal interview develops the most accurate responses but is more expensive than the questionnaire. Jobs surveyed by mail must be very well defined or the data may not be accurate. Telephone calls may be used to follow up the mail questionnaire or to gather data; this procedure is quick but a telephone call cannot yield a substantial amount of detailed information;
- compiling these data in a systematic way to determine the spread of rates found for each class.

The Northwest Central Dispatch System recently conducted a wage survey to determine the prevailing pay rates in Northern Illinois for shift supervisors and dispatchers. They surveyed fifteen other shared communications systems and obtained their salary ranges for both positions as well as the actual salaries being paid to incumbents in both positions. They determined that NWCDS' official salary policy line for both positions (i.e. midpoint in the salary range) was very competitive with what other systems were offering, but that the actual salaries being paid by NWCDS were considerably lower than the actual salaries being paid by the competition. Actual salaries being paid for dispatchers by NWCDS was below the lowest amount being paid in the marketplace. Actual salaries for shift supervisors in NWCDS equalled the lowest salaries on the outside. One of the main factors

*N.F. Crandall, "Wage and Salary Administrative Practices and Decision Processes," Journal of Management 5:1 (Winter, 1979), pp. 71-90; Bureau of National Affairs, Job Evaluation Policies and Procedures PPF Survey No. 113 (Washington, D.C., 1976).

**O. Glenn Stahl, Public Personnel Administration 6th Edition (New York: Harper & Row, 1971), p. 86.

explaining this salary discrepancy was that NWCDS had hired many new employees in the previous year who would be lower paid on the average than the "veterans" employed by other systems. As a result of this analysis, NWCDS' management recommended to its Board of Directors that: (1) salary policy line for shift supervisors should be raised by 2% to make the NWCDS' line correspond with the official salary lines in other systems; and (2) general and merit increases should be provided for all eligible employees in order to remain competitive with the prevailing salaries actually being paid for comparable work at other shared communications systems.

In conducting wage surveys, it must be acknowledged that the competitive market rate is not a perfect guide to the establishment of pay levels in the public service. It is difficult to insure that the jobs being compared are truly comparable; an accounting clerk in one communications system may have different duties than a clerk in another system. In addition, the wider the geographic area covered by a wage survey, the more likely the results will be affected by differences in system operations, local cost of living, and competition with private industry for the same workers. Finally, some sharing arrangements may have no comparable arrangements in the surrounding area nor will they have private sector counterparts to many of the jobs included in the system's pay structure. The tasks outlined above may help to minimize these problems but cannot avoid them entirely.

4. Make individual pay determinations. The final issue in establishing a compensation process is pay for individual employees. The direct and indirect compensation paid to any one employee is a product of salary negotiations upon initial hiring (although the pay class is normally tied to the position and fixed), subsequent performance reviews and promotions, and across-the-board increases. The most crucial consideration in individual pay determination is that employees performing the same work receive approximately the same pay (allowing for seniority variations).

4.7 Performance Appraisal

An effective appraisal process for employees depends on several factors. Top management support is essential since without some assurance that the information provided by performance appraisals will be used to

reward and discipline employees, few people are likely to take the appraisals seriously. Superiors and subordinates who will be involved in the appraisal process should be involved in its establishment and implementation so that they will be committed to and accept it. Finally, the appraisals should focus on objectives based evaluation criteria and measures rather than just on "hygienic" factors such as cooperation, initiative, or personal appearance.

Exhibit 4.14 depicts the steps in the formal performance appraisal process. In most shared communications systems, two appraisal processes exist side by side: the formal and the informal. The informal process occurs daily as superiors, colleagues, and subordinates observe the job performance of each employee and make judgments, tentative at first but later with increasing certitude, about that person's knowledge, skills, and attitudes. Formal appraisals, the focus of this section, are those set up by the system to regularly and systematically evaluate employee performance. We focus on two steps: (1) establish evaluation policies, and (2) gather data on performance.

1. Establish evaluation policies. A policy statement of a performance appraisal process should specify:

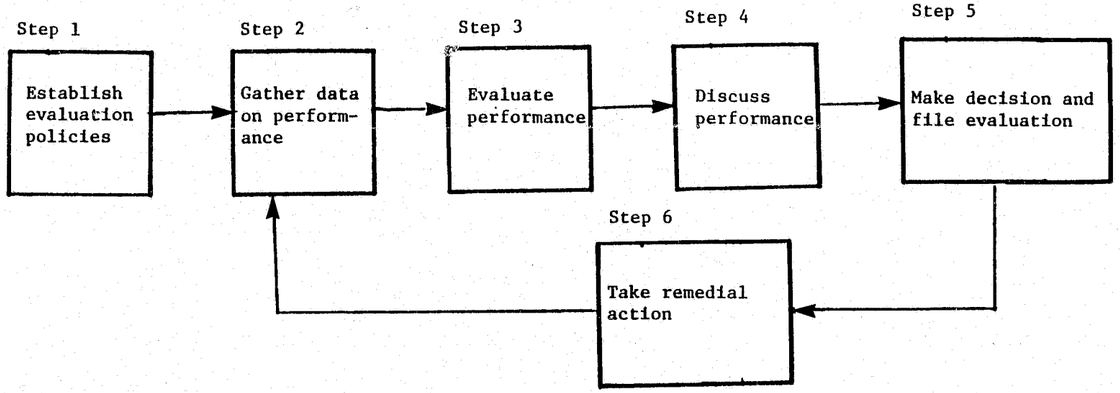
- What is evaluated--the criteria for evaluation
- When evaluation takes place
- Who evaluates
- How evaluation takes place--the evaluation techniques

What is and should be evaluated about employee performance is the most important policy issue. The factors which should be considered in the appraisal process are called the evaluation criteria. The criteria should arise from the job itself: job analysis, job description, and job evaluation. There are three types of criteria: personality, performance, and objectives.

Personality criteria are based on the often erroneous assumption that possession of certain behavioral or character traits will result in good performance. Examples of these criteria include: dependability, initiative, and cooperation. Performance criteria are aimed at overall judgments about effectiveness on-the-job and include quality of work, quantity of work, job

Exhibit 4.14

PERFORMANCE APPRAISAL PROCESS



knowledge, and attendance. Both personality and performance criteria are used by the South Bay Regional Public Communications Authority to evaluate communications operators, as illustrated by the employee appraisal form excerpted in Exhibit 4.15.* Unfortunately, personality and performance criteria suffer from vague definitions of terms and consequently subjective and inconsistent judgments about the extent to which they have been achieved. They also do not relate directly to the goals of the enterprise.

Objective criteria, on the other hand, result from a belief in management-by-objectives (MBO) in which superior and subordinate collaboratively set individual objectives to guide the subordinate's work over a specified time period, e.g. communications operators will increase their dispatch accuracy by 20% by March 1, 1984. This approach provides a more empirical basis for evaluation and can be directly job-related, although there may be some question about whether individual employees can or should be held accountable for the achievement of organizational objectives. An example of an appraisal form based on objective criteria is shown in Exhibit 4.16.

2. Gather data on performance. Even though formal appraisals may occur but once per year, the gathering of the performance data on which these appraisals will be based should be continuous. Observation, interviews, and records can all be used to form judgments about employee performance, e.g.:

- A shift supervisor routinely monitors her operators as they receive complaints and dispatch police and fire units;
- The technical services manager informally chats with the communications technicians to see how things are going in their department and how the senior communications technician is performing;
- The general manager regularly checks incident records to spot problems in dispatch speed or accuracy;
- The performance of communications technicians is appraised by reviewing repair records to determine the quality of the repair work and the incidence of further repairs on the same equipment.

*The complete appraisal form is in Appendix G.

Exhibit 4.15

USE OF PERSONALITY AND PERFORMANCE CRITERIA
(South Bay Regional Public Communications Authority)

UNSATISFACTORY	MARGINAL	SATISFACTORY	GOOD	OUTSTANDING			
					SECTION I (General Work Habits)		
					a. Absenteeism	:	reasonableness; timing
					b. Appearance	:	acceptable attire; grooming
					c. Codes	:	knowledge; application
					d. Confidence	:	independence of action
					e. Efficiency	:	accuracy/speed of data entry
					f. Equipment	:	use/care; includes work area
					g. Polish	:	interaction with public, city personnel
					h. Professionalism	:	tact; discretion; confidentiality
					i. Punctuality	:	on-time work reporting
					j. Reliability	:	follows directions, work rules
					k. Responsibility	:	accepts effectively
					l. Stress	:	manages work under pressure
					m. Teamwork	:	interaction with others
					SECTION II (Telephone Call Processing)		
					a. Codes	:	priorities, actions, early entry
					b. Control	:	dominance of conversation
					c. Product	:	composition, text of call
					d. Questioning	:	screening, efficiency
					SECTION III (Radio Dispatching)		
					a. Changes	:	maintenance of equipment status
					b. Traffic	:	comprehension; control
					c. Voice	:	clarity; diction; forcefulness

Exhibit 4.16

OBJECTIVES-BASED APPRAISAL FORM

PROGRESS REVIEW

For
Exempt Salaried
Employees

(This side to be completed by Immediate Manager)

PART ONE

Name_____ Payroll No._____ Dept. No._____
(Last) (First) (Initial)

I. EVALUATION OF PERFORMANCE AND QUALIFICATIONS

A. GOALS (Desired individual's overall performance on present assignment in terms of major objectives. Describe special accomplishments. Indicate performance trend. State future goals, work timetables for completion.)

B. QUALIFICATIONS (Describe technical, interpersonal, managerial qualifications, etc.)

1. STRENGTHS

2. DEVELOPMENT NEEDS

II. DEVELOPMENT AND CAREER RECOMMENDATIONS

A. DEVELOPMENT RECOMMENDATIONS (Specify development plans for the next 12 months which are responsive to identified needs.)

B. POTENTIAL NEXT ASSIGNMENT (Consider alternatives.)

C. CAREER ROUTE AND GOALS (How realistic are the individual's career goals, and are they compatible with your views of his/her capabilities? Make a clear statement with respect to long-range development; needs and recommendations for future positions and training.)

Completed by
Immediate Manager_____ Date_____ Employee
Signature_____

Reviewing Manager_____ Date_____ Date Discussed with
Employee_____

Source: P. Pigors and C.A. Myers, Personnel Administration (New York: McGraw-Hill, 1981), p. 296.

* * *

Chapter 4 has discussed various aspects of the personnel function applicable to a shared communications system: employment planning, recruitment and selection, training, compensation, and performance appraisal. The next chapter deals with acquiring and managing the financial resources needed not only to pay the salaries of system personnel but also to underwrite every phase of its operation.

Chapter 5

MANAGING FINANCIAL RESOURCES

The management of a shared communication system's financial resources is crucial to the preservation of its assets and the effective delivery of its services. Financial management is more than just raising revenues through assessments of member jurisdictions. It is also concerned with allocating available funds to the system's activities, expending the funds on approved products and services, and recording all financial transactions accurately and promptly. The magnitude and severity of the fiscal crises of governments everywhere makes it all the more important that shared communications systems handle their financial resources responsibly.

5.1 Role of Financial Management

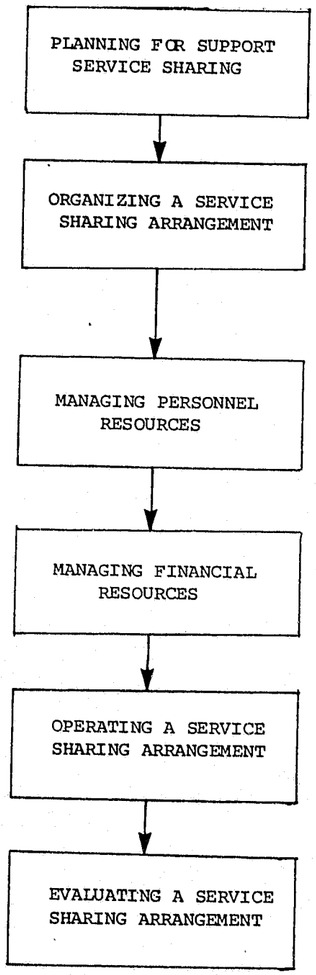
The financial management function serves two general purposes: (1) to ensure that sufficient funds are on hand to finance system operations and (2) to expend the funds in a prudent manner. To these ends, a shared communications system engages in the three financial activities depicted in Exhibit 5.1:

- Budgeting. This is the preparation and authorization of a plan of financial operation embodying an estimate of proposed expenditures for a given period (typically a fiscal year) and the proposed means of financing them (revenue estimates).
- Financing. This is the provision of funds required for budget execution and system operations through assessments of member jurisdictions, grants, and investment income.
- Auditing. This is the systematic examination of resource utilization in order to ascertain whether financial statements fairly present financial condition and the results of operations as well as to test whether financial transactions have been recorded accurately and consistently.

The contractual arrangement and by-laws that govern the communications system provide the basic framework within which financial management must be carried out. Provisions of state laws, municipal charters, and local ordinances provide additional guidelines for the system's fiscal officer. These documents frequently address matters such as: What are the responsibilities

Exhibit 5.1

MANAGING FINANCIAL RESOURCES



of system management and local officials with regard to budgeting, financing, and auditing? What legal actions are required to establish an official budget or levy assessments? How detailed must budget enactments be? Who must authorize expenditures? If existing documents do not fully and clearly specify the powers and duties with respect to financial management, prompt actions must be taken to fill the gaps before an actual problem or issue arises.

5.2 Budgeting

Simply stated, a budget is a dollar-and-cents plan of operation for a specific period of time. At a minimum, such a plan should contain information about the types and amounts of proposed expenditures, the purposes for which they are made, and the proposed means of financing them.

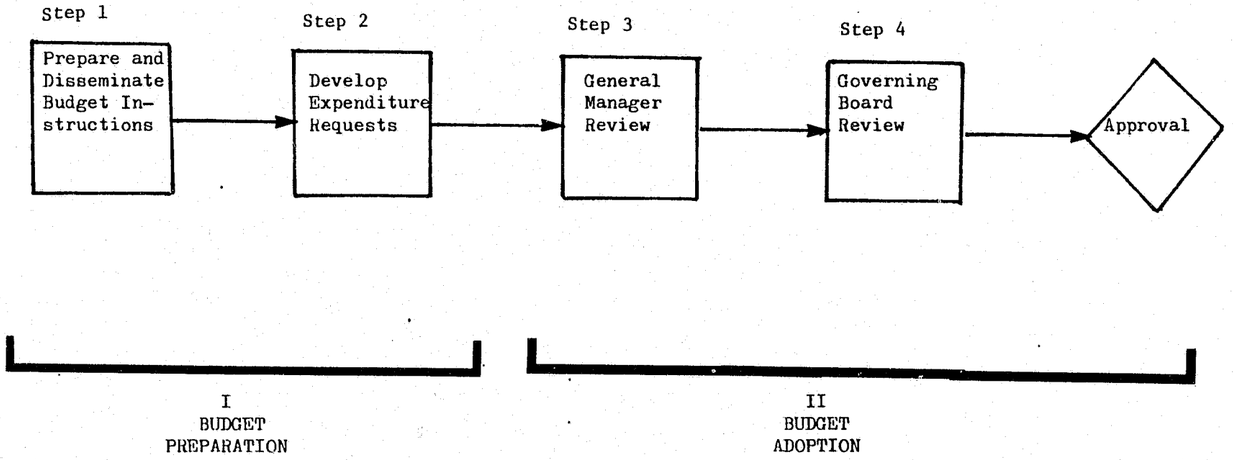
Exhibit 5.2 depicts a typical budget cycle, i.e., the steps involved in preparing and approving an annual budget. It is divided into two phases: (1) budget preparation and (2) budget adoption. The remainder of this section will discuss specific aspects of each step especially pertinent to a shared communications system.

1. Prepare and Disseminate Budget Instructions. At the start of the annual budget preparation cycle, the general manager and board of directors should initiate discussions with member jurisdictions concerning the principal policies which should be reflected in the budget. To develop these policies it will first be necessary to review current year fiscal conditions and the prospects for the next fiscal year. Such a review is aimed at identifying the financial constraints that will be faced in the next budget year, including preliminary revenue estimates, trends in inflation and local economic conditions, estimated service levels, and major cost items which will fall due in the budget year. These policies should be endorsed by the board of directors (or other authorizing body in an agency supplier system) and disseminated to member jurisdictions.

After overall policies have been developed, the system's general manager or chief fiscal administrator should prepare and disseminate to each line and staff department in the system a set of detailed instructions for

Exhibit 5.2

BUDGETING PROCESS



preparing the budget.* The instructions should be sent early in the budget cycle, at least 30 days before the budget requests are due. Instructions should include items such as the following:

- Statement from general manager summarizing the anticipated fiscal position of the shared communications system and an outline of overall fiscal policies to be pursued. Department heads (operations, technical services, etc.) should be encouraged to examine the merit of existing programs and to justify fully requests for new or expanded programs or services;
- A budget calendar indicating dates of all pertinent activities relating to completion of the budget. Exhibit 5.3 contains a budget calendar suitable for a joint provision arrangement;
- Range of permissible salary increases for system employees, based on cost of living adjustments or merit increases;
- General guidelines on rate of inflation to be used in estimating costs, current prices of office equipment and supplies, and other factors that would apply to all departments across the board;
- Copies of all forms to be completed along with detailed instructions and examples of how to complete them. Types of forms needed would include: detailed worksheets for personal services, operating expenses, and equipment requests. The most critical forms are discussed more fully in the next step on preparing expenditure requests.

An important issue that should be resolved in the budget instructions should be the way in which budgetary information should be presented. The budget classification structure may be simple or complex depending on the needs of the shared communications system. It should provide data in the format and level of detail which each system manager and local official needs to analyze budget requests effectively, to monitor and control the provision of services in conjunction with the budget, and to evaluate performance.

The budget classification system for a shared communications system may be built around the following components:

- Organizational Unit: departments or other system divisions responsible for particular expenditures, e.g., operations, technical services, general manager;

*The term "department" refers to the organizational units or individuals employed by the shared communications system, e.g. operations, technical services. The term does not relate to the police and fire departments who are members of the system.

Exhibit 5.3

SAMPLE BUDGET CALENDAR

DATES	ACTIVITIES
January 1-31	Develop policy guidelines through: discussions between general manager and governing board, estimate of revenues and expenditures, and review of service sharing agreement.
February 1	Disseminate budget instructions to department heads.
February 1-28	Department heads develop expenditure requests and submit to system budget officer.
March 1-31	Budget officer and general manager meet with department heads to discuss expenditure requests and finalize budget recommendations.
April 1	Budget recommendations are presented to governing board and member jurisdictions.
April 1-30	Governing board considers budget, adopts it as amended, and transmits it to member jurisdictions for appropriate action and financing.
May 1-June 30	Adopted budget recorded in accounting records. Allocated to departments.
July 1	Beginning of fiscal year. Budget goes into effect.

- Activity: identifies a particular service or administrative function performed, e.g., receiving calls for service, dispatching police units, hiring new personnel;
- Program: a broad category of activities or services provided by the organization, e.g., internal management, external liaison, data processing, equipment maintenance;
- Object of Expenditure: a specific category of cost designed to provide detail on the types of products or services that the system has to purchase in order to operate, e.g., personal services, purchased services, supplies and materials, capital outlay;
- Source of Revenue: type of revenue received, such as direct taxes, user fees from member jurisdictions, or federal or state grants; and
- Project: a special classification for major capital outlays and sometimes for federal grant activities such as the purchase of a new repeater station using an LEAA grant.

The vast majority of shared communications systems budget only by object of expenditure. They prefer its simplicity and its detail. Some also acknowledge that an object of expenditure budget provides information only on the "things" purchased by the system and ignores services produced by the system. Therefore, these systems attempt to refine the budget by providing additional information on: (1) level of service to be provided for given levels of expenditure, and (2) expenditures incurred by each major program of the system. An example of a budget excerpt along these lines is presented in Exhibit 5.4.

2. Develop Expenditure Requests. A shared communication system's budget should be based directly on service needs. When expenditure requests are developed, department managers and the general manager should carefully consider:

- how much service is needed in terms of anticipated calls for service;
- what minimum and maximum levels of service can be provided;
- how many resources are needed to deliver each level of service (operators, equipment, supplies, etc.); and
- how resources can be used more efficiently in providing services.

Exhibit 5.4

SAMPLE BUDGET

Object of Expenditure \ Program	General Management	Operations	Technical Services	TOTAL
Personal Services				
Regular Salaries	80,000	250,000	100,000	430,000
Overtime		10,000	4,500	14,500
Purchased Services				
Space Rental	1,000	5,000	2,000	8,000
Telephone	6,000	40,000	3,000	49,000
Postage	500	100	200	800
Printing	1,000	2,000	500	3,500
Training	0	1,500	500	2,000
Supplies and Materials				
Office Supplies	1,000	500	250	1,750
Equipment Supplies	300	2,000	500	2,800
Reference Materials	100	1,000	450	1,550
Other	50	75	75	200
Capital Outlay				
Office Equipment	6,000	2,000	1,000	9,000
Radio/Electronic	0	22,000	5,000	27,000
Site Improvements	3,000	35,000	8,500	46,500
Other	2,500	10,000	5,000	17,500
TOTAL	101,450	381,175	131,475	614,100
Service Indicators				
No. of calls for service		100,000		
No. of employees supervised	25			
No. of new employees hired	8			
No. of mobile radios repaired			10	

For example, a shared communications service might anticipate 300,000 calls for service during the upcoming year. The use of workload standards might suggest that each communications operator can handle 15,000 calls for service per year, which translates into a total operator work force of 20 operators at $15,000 average salary. Equipment and facilities expenses can also be estimated based on the anticipated workload.

In addition to service needs, department managers are also likely to consider what kinds of programs the general manager and governing board are likely to support. In most cases, agencies can be assured that they will not get more than they request and probably will get less. Thus, they will ask for an amount that seems "reasonable" or slightly above this level to allow for some cutbacks. This amount will be based on: last year's appropriation, automatic increases for current personnel and cost of inflation to continue existing service levels, cost of additional service, and expected revenues for the system during the budget year.*

In preparing a budget request, department managers have to make separate cost estimates for:

- Personal Services. Salary costs account for over 70% of the costs of the typical shared communications system, so their estimation is a crucial part of the budget process. Essential to estimating salary costs is a systematic employment planning process that indicates how many personnel will be needed to deliver planned service levels (see Section 4.2). Additional salary costs may stem from anticipated overtime, shift differential requirements, or requirements for temporary help during peak periods. A personal services worksheet should be prepared for each department or activity, as suggested by Exhibit 5.5. The worksheet shows one method for budgeting salary costs, not including fringe benefits which are budgeted separately.
- Operating Expenses. This object of expenditure category is typically broken down into two major sub-categories: purchased services, and supplies and materials. Purchased services (also known as contractual services) includes rent, utilities, travel, printing, training, and similar items. Competitive bids should be used wherever possible and the costs budgeted should not exceed prevailing rates in the community. Supplies and materials include not only

*Adapted from Fred A. Kramer, Contemporary Approaches to Public Budgeting (Cambridge, MA: Winthrop, 1979), pp. 7-8.

Exhibit 5.5

PERSONAL SERVICES WORKSHEET

Department: Operations

(1) Position Number	(2) Position Title	(3) Employee Name	(4) Current Hourly Rate	(5) No. Hours Per Year (not including vacation & sick time)	(6) Current Annual Salary (4)x(5)	(7) Expected Salary Adjustment	(8) No. Hours for Adjustment	(9) Total Adjustment (7)x(8)	(10) Total Budgeted Salary (6)+(9)
008	Operations Mgr.	John Miller	11.75	1,800	21,150	.80	800	640	21,790
014	Communications Supervisor	Mary Todd	9.00	"	16,200	.60	"	480	16,680
015	"	Joe Paterno	9.25	"	16,650	.60	"	480	17,130
016	"	Leslow Quail	9.00	"	16,200	.60	"	480	16,680
022	Communications Operator	Alicia Jones	7.00	"	12,600	.50	"	400	13,000
023	"	Tom Luciano	7.50	"	13,500	.55	"	440	13,940
024	"	Bill Schwab	7.00	"	12,600	.50	"	400	13,000
025	"	Patricia Klein	7.10	"	12,780	.52	"	416	13,196
026	"	Denise McGrath	7.10	1,000	7,100	.52	400	208	7,308
027	"	Nancy Osborne	7.50	1,000	7,500	.55	400	220	7,720
028	"	Barry Ladd	7.00	1,000	7,100	.50	400	200	7,300
TOTALS				17,400	143,380			4,364	147,744

CONTINUED

2 OF 4

office supplies but also supplies and materials required for equipment operation such as computer tape and paper. Usually, historical costs plus an inflation factor can be used to estimate operating expenses, assuming that the level and quality of service remain unchanged. Exhibit 5.6 presents a worksheet for estimating operating expenses that provides information on prior expenditures, current requests, and the rate of increase or decrease in each expense category.

- Equipment. Equipment includes items which would normally last more than a year and cost more than a specified dollar amount, e.g. $100. This category includes office equipment such as typewriters, desks, and chairs as well as communications equipment such as dispatch consoles, terminal keyboards, transmitters, repeater stations, and printers. The equipment worksheet in Exhibit 5.7 lists the item requested, the number of each item, whether the item is new or a replacement, the unit cost per item, and the total request.

An important consideration in developing the budget is planning for multi-year cyclical expenditures. Many expenditures do not occur on a regular annual basis, but irregularly as items wear out or become obsolete and must be replaced. For example, most vehicles have a useful life of several years and are therefore replaced only periodically. Facilities have a much longer life span. In the year in which these replacements must be purchased, the shared communication system's budget may be strained.

A shared communications system may take several different approaches to reduce the impact of these multi-year cyclical expenditures. First, certain large equipment like dispatch consoles could be funded through a capital budget kept separately from the regular operating budget and financed by some form of debt issue. It is argued that if a commodity is going to provide value to member jurisdictions over a number of future years, then the revenue and the taxpayers in each of these years should contribute to paying for the commodity. For this reason, it is important that the repayment schedule on the debt issued to purchase the commodity matches the anticipated life span of the commodity, e.g., buildings (25-45 years), improvements (5-40 years) and equipment (3-10 years).

Second, a purchasing schedule for each major cyclical expenditure could be established and a proportional amount could be reserved each year

Exhibit 5.6

OPERATING EXPENSE WORKSHEET

Department: Operations

Code/Object	Prior Year Expenditure 1980-81	Current Year Budget 1981-82	Proposed Budget 1982-83	% Increase (Decrease) from Current Budget
311/Facility Rental	$10,000	$ 10,000	$12,000	20%
312/Dues and Public.	50	75	75	0
313/Telephone	25,000	30,000	37,500	25
313/Teletype	7,000	8,500	10,250	21
314/Equip. Mainten.	15,000	21,000	23,000	10
315/Postage	100	200	300	50
316/Printing	2,500	2,750	2,750	0
317/Legal	0	1,500	2,000	33
318/Travel	3,000	3,000	2,800	(7)
319/Utilities	15,000	18,000	19,000	6
401/Office Supplies	750	1,000	1,100	10
402/Equip. Supplies.	2,000	2,200	2,400	9
403/Reference Mat.	600	600	500	(17)
TOTAL	$ 81,000	$ 98,825	$113,675	15%

Exhibit 5.7
EQUIPMENT WORKSHEET

Department: Operations

Item	Number Requested	Replace/ New	Unit Cost	Total Request
Operator headsets	20	R	120	$2,400
Call check recorders	5	N	1,500	7,500
Automatic coders	10	R	200	2,000
Police dispatch console	1	N	30,000	30,000
Terminal keyboards	3	R	600	1,800
Cathode ray tubes	5	R	125	625
			Total	$44,325

in the budget to meet the replacement cost at the time replacement is required. This is how the shared communications system in St. Petersburg, Florida budgets for its future equipment needs. In this way, a cash reserve is built up from several years' revenue to meet replacement costs. However, such an approach has the disadvantage of incurring very high one-time costs at the outset of the process, since a commodity would first have to be bought and paid for completely and a portion of its replacement cost reserved immediately thereafter.

3. General Manager Review. Departmental requests for funds typically exceed existing available resources. Consequently, a central budget review is necessary to bring budget requests into balance with available resources. In smaller shared communications systems, this review is done by the general manager or the police chief in an agency supplier arrangement. However, larger systems place a budget officer (e.g., finance administrator) between the departments and the general manager in order to bring the necessary expertise and time to this vital organizational activity.

This review should occur throughout the budget preparation process. As issues arise at the department levels, the general manager should become involved. Scheduled meetings should occur among all the parties to discuss expenditure requests, priorities, and strategies. Additional reductions or increases in the budget may occur at this time.

After the general manager's changes are incorporated in the proposed budget, efforts toward completing the budget document begin. The document should include the following:

- message from the general manager which describes the major assumptions underlying the budget, major issues that the governing board must address, and significant changes in the budget from the current year's budget;
- summary of total revenues by source;
- summary of total expenditures, by department or activity, highlighting significant changes; and
- a detailed justification of budget recommendations as illustrated by an excerpt from the 1981-82 budget of the Northwest Central Dispatch System in Exhibit 5.8.

In presenting total expenditures, many shared communications systems will not only display the proposed budget but also the budget for specific line items for several years previously. This provides the governing board with a long-term perspective on budget requests and how they have changed

Exhibit 5.8

SAMPLE BUDGET JUSTIFICATION
(Northwest Central Dispatch System)

CAPITAL OUTLAY

Page 18A

Department: NWCDS
Activity: _____
Date: 01/15/81
Prepared By: Vivian Sorce

Priority Rating: Essential [XX] Desirable [ ]

1. Description of Item:

Word Processing System

2.	QTY	Unit Cost	Total
Estimated Cost	1	$10,000	$10,00
Less: Trade-in			
Net Cost		$10,000	$10,00

3. Explain need for this expenditure:

- [ ] Scheduled Replacement
- [ ] Present Equipment Obsolete
- [x] Replace Worn-Out Equipment
- [x] Reduce Personnel Time, Hours per Day ____
- [x] Expanded Service
- [ ] New Operation
- [ ] Increase Safety
- [x] Additional Equipment

4. Number of similar units on hand ____
none

5. Specify Items That Will Be Replaced By Above Item:

Item/Unit No.	Make	Age	Prior Years: Maint. Cost	Prior Years: # of Breakdowns
1. IBM Typewriter	Selectric II	4	$ 94/year	18
2.				
3.				
4.				

Recommended Disposition:
[ ] Trade-In [ ] Salvage [ ] Sale [x] Possible use by other Department
used by assistant manager and supervisors for evaluations and reports

6. Justify need for this item, describing its use and work load, or any expansion of answers above:

A word processing system would greatly reduce the amount of time expended on typing and retyping all letters, procedure manual sections, Street-to-Beat/District reference sheets and various forms. There is also a soft-ware program for check writing (offered by some systems) that we could use ourselves rather than going to EGV and paying them to do our bookkeeping. (By utilizing a word processing system, we would also have the proper amount of time available to do the bookkeeping duties.)

The indexing of the procedure manual would not have to be completely retyped, just new entries inserted. Form letters could be done on the high-speed printer and originals sent to each individual on a given list. Corrections to long letters, forms, geographical indexes and policies and procedures could be done in a matter of seconds rather than taking the 20 to 30 minutes now necessary to totally retype when you are only inserting two lines in a paragraph. You also have a much more professional looking final product.

Much of the expensive photocopying that we do now could be eliminated or substantially reduced.

(continued on next page)

7. Will purchase of item require an increase in personnel at any time?
[ ] Yes [x] No
If yes, when _____
How many _____
Classification _____ _____
It would cut down on [illegible] done by others during peak loading periods and would diminish the cost of overtime.

8. For Use By Finance:
Budget Approval [ ] Yes [ ] No
Purchase Order Approval
P.O. No. _____
Date _____
Amount _____

over the years. In addition, the budget may present both the official budget recommendation of the system (usually that made by the general manager) and the original departmental request. Substantial differences between what the departments requested and what the general manager approved often provoke interest and investigation on the part of the board. The annual budget of the South Bay Regional Public Communications Authority exemplifies both a multi-year budget perspective as well as an occasional departmental and executive difference of budgetary opinion. A portion of that budget is illustrated in Exhibit 5.9.

4. Governing Board Review. Adoption of the proposed budget by the governing board establishes the legal authority for system management to incur expenditures in the next fiscal year. In an agency supplier arrangement, the governing board will be the legislative body of the supplying jurisdiction (e.g., town council, board of selectmen) with member jurisdictions having a consultative role. Final approval of the supplying jurisdiction's city manager or mayor may also be necessary. In a joint provision arrangement, the board of directors serves as the governing board.

Board review occurs through informal briefings and formal presentations by system officials. Citizen participation should be carefully structured to allow genuine participation while avoiding disruptions and undue delays. Citizen input can be obtained either directly through written comments or scheduled oral presentations or indirectly by inviting public testimony by civic organizations and interest groups.

After the formal hearings, the board completes its deliberations, amends the budget as appropriate, and enacts a formal budget resolution. This resolution establishes the spending ceilings for the shared communications system for the fiscal year and authorizes all financial transactions. It should not be as detailed as the budget document in order to give system management some flexibility to manage funds on a day-to-day basis while retaining necessary funds control. For example, the resolution might authorize a lump sum for purchased services of all types, whereas the budget details amounts for specific items within purchased services. Fiscal limitations to insure the board's ultimate control over system finances should be explicitly

Exhibit 5.9

SAMPLE BUDGET PRESENTATION

(South Bay Regional Public Communications Authority)

ACTUAL 1979-80	BUDGETED 1980-81	ESTIMATED 1980-81	ADMINISTRATIVE AND OPERATIONS BUDGET	DEPT'L REQUEST 1981-82	EXEC. DIR. RECOMMENDATION 1981-82	FINAL BUDGET 1981-82
			RENTAL AND BUILDING MAINTENANCE			
17,774	15,300	17,470	051 Administrative Office	17,520	17,520	17,520
518	18,000	18,560	052 RCC	18,475	18,475	18,475
-0-	500	-0-	053 South Bay Hospital (transmitter site)	-0-	-0-	-0-
1,456	2,000	1,530	054 Punta Place - PVE	2,000	2,000	2,000
4,667	4,500	5,285	061 Telephone - Administrative Office	5,300	5,300	5,300
64,865	60,000	65,000	062 Telephone - RCC, SBH, PP	65,000	65,000	65,000
89,280	100,300	107,845		108,295	108,295	$108,295
			EQUIPMENT			
1,931	1,500	500	067 Vehicle Operating Expenses	500	500	500
10,549	-0-	-0-	078 Equipment Replacement Fund	-0-	-0-	2,500
12,480	1,500	500		500	500	3,000
15,995	44,751	2,800	079 CONTINGENCY FUND	50,000	50,000	50,000
15,995	44,751	2,800		50,000	50,000	50,000
3,394	2,000	5,950	081 PERSONNEL PROCESSING	5,950	5,500	6,000
3,394	2,000	5,950		5,950	5,500	6,000
			PROFESSIONAL AND TECHNICAL			
2,053	2,400	1,580	082 Audit Fees	2,000	2,000	2,000
21,210	-0-	-0-	083 Consultants - Communications Systems	25,000	-0-	5,000
502	-0-	-0-	084 Consultants - FCC Services (Jeremiah Courtney)	-0-	-0-	-0-
3,787	8,000	8,000	085 Consultants - Other (Software Systems)	8,000	8,000	10,000
5,326	3,000	4,000	086 Financial/Purchasing Services	7,800	7,800	7,800
4,827	3,000	6,525	087 Legal Services	6,000	6,000	6,000
37,705	16,400	20,105		48,800	23,800	30,800
			CAPITAL OUTLAY			
3,312	43,560		093 Communications Equipment	282,315	25,315	91,315
-0-	22,440	66,000	094 Computer Equipment	35	35	35
1,538	-0-		095 Furniture and Furnishings	200	200	200
1,140	-0-		096 Office Machines and Equipment	-0-	-0-	-0-
5,990	66,000	66,000		282,550	25,550	91,550
$1,017,965	$1,235,303	$1,244,480	TOTAL - ADMINISTRATIVE & OPERATIONS BUDGET	$1,576,725	$1,269,755	$1,366,815

stated in the resolution, e.g., a provision that no expenditure above a certain amount may be made without board approval.

The final budget document should be disseminated to all local officials and made available to the public.

5.3 Financing

Since the greatest source of funds for the budget year will be revenues collected in that year, the preparation of reliable revenue estimates is critical. A shared communications system relies on user fees for almost all of its revenue, with state and federal grants accounting for a small and decreasing percentage of total revenue. For example, about 98% of the 1981-82 budget of the South Bay Regional Public Communications Authority is funded by user fees. In an agency supplier system, the supplying jurisdiction estimates total communications costs, determines its own share of those costs, and then levies user fees on member jurisdictions to recover the remaining costs.

5.3.1 User Fees

The essential issue underlying the assignment of user fees to member jurisdictions in a shared communications system is one of equity. Ultimately, there is no single approach to determining what is fair for each cooperative arrangement. The fee decision is best worked out among the member jurisdictions (both provider and consumers), since they are most aware of and best able to voice their individual concerns.

In most cases, user fees are assessed based on considerations of each jurisdiction's service requirements and ability to pay. More specifically, the following alternative approaches to fee assessment can be identified:

- flat fee;
- fee based on actual usage (calls for service);
- fee based on potential usage (population);
- fee based on ability to pay (property valuation); and
- some combination of the above, which may include weighting each approach in terms of its perceived importance.

A flat fee means that member jurisdictions pay the same user fee regardless of ability to pay or service usage. It can also mean that members pay the same minimum fee to which are added additional fees based on other considerations. The flat fee is inherently simple to calculate and administer but it is also unfair and not widely used. It may raise special problems for smaller departments who may feel that an unfair burden is being placed on them. An example is provided by the experience of Central Police Services in Muskegon, Michigan. Although the formula adopted there placed equal weight on the factors of population, property value, and volume of dispatch requests and administrative messages, the system also imposed a minimum fee, which was set at 5 percent of the total dispatch expenses. While offering minimal savings to the larger departments, this amount was perceived as excessive by the smallest jurisdiction, which withdrew from the arrangement. Subsequent negotiations resulted in a revised figure of three percent of total costs which proved to be satisfactory to all members.

Basing fees on actual usage as measured by calls for service is part of the financing formula of almost all shared communications systems. It seems fairer than a flat fee because it takes into account the relative service demands of member jurisdictions. The workload generated for a shared communications system will vary depending on whether the system handles all calls or only part of the members' calls for service (e.g., the system only handles calls after certain hours or after a fixed number of telephone rings at the member jurisdictions' switchboards). The workload will also vary depending on whether members require dispatching units on all calls or only calls designated "high priority" (e.g., officer in distress, violent crime, natural disaster).

Population is often used as an indicator of potential usage. Care must be taken when potential usage is employed as a costing factor, however. Radio communications is a service highly dependent on seasonal fluctuations, and the potential usage may vary during the year in tourist or college towns

which experience substantial changes in their resident populations. Thus, when a potential use factor is being considered, it is advisable to use it in combination with other components which are responsive to population shifts (such as actual usage). In New Jersey, for example, the Sussex-Morris arrangement allocated its operational costs according to a formula weighted 60 percent on population and 40 percent on usage. The members of this cooperative arrangement were satisfied that the 60/40 mix would adequately compensate for both the seasonal changes in population of three members and the heavy commercial workload of two others.*

Property valuation as an indicator of ability to pay is a very prevalent approach to fee assessment. Recognizing that poor economic conditions often drive up the crime rate, advocates of this approach argue that the most economically disadvantaged members of a shared communications system are likely to have the highest needs for system services, but the lowest ability to pay the user charges. Therefore, each participating jurisdiction's assessed property valuation should be considered in allocating user charges. Property values constitute 40% of the tax base of the average local government in the U.S. and are viewed by most economists as a stable revenue source. Because property values cover both residential and commercial property, they are a better indicator of "ability to pay" than resident income which does not consider the workload produced by calls for service from commuters who work but do not live in the jurisdiction.

Most shared communications systems combine calls for service with one or two other indicators, such as population or property valuation. Weights are assigned to each indicator in order to determine what percentage of a jurisdiction's total fee will be based on its calls for service, population, and other factors. For example, the Northwest Central Dispatch System apportions its user fees based on two weighted factors: calls for service (50 percent) and population (50 percent). In the South Bay Regional Public

*Eskil Danielson, "Regionalized Police Communications: Economical, Efficient and Effective," Law and Order (February, 1979), pp. 50-53.

Communications Authority, user fees are based on: assessed value (30 percent), population (30 percent), and calls for service (40 percent). How the Authority used these weights to determine their FY 1981-82 assessment schedule is presented in Exhibit 5.10.

A final concern is raised in those arrangements which distinguish between fixed and operational expenses. For example, in the Sussex-Morris arrangement it was agreed that certain fixed costs would be equally shared among all members. Included in these costs were rental of the communications room, bookkeeping and secretarial fees, accountant fees, auditor fees, and legal fees.* Because all members require these services, the issue is fairly straightforward in this instance. However, the example raises the question of how to allocate fixed costs which are not the equal responsibility of all jurisdictions. For instance, in some areas of the country, radio transmissions are subject to gaps (geographical areas where traditional radio technology is unable to penetrate). When gaps are all located in a single jurisdiction questions arise concerning who should pay the cost of required "repeater" stations and other sophisticated technology. It is recommended that costs which are more properly the "responsibility" of some jurisdictions than others be explicitly considered in all cost negotiations. At that time the benefits to all members can be discussed.

Once a formula has been established, potential problems may arise if it becomes necessary to alter the formula used. For example, users of the St. Louis Cooperative Communications arrangement paid a flat fee of ten dollars per month per unit for over 20 years. In effect, the county was heavily subsidizing the provision of communications to other police agencies. When the inevitable readjustment finally became necessary, a formula allocating total costs on the basis of actual usage was envisioned. Not unexpectedly, substantial increases in fees were experienced by some members; one consumer faced a 1900 percent increase in payments. Although prices are generally expected to fluctuate, replacing an inappropriate cost formula with one calculated on an entirely different basis may cause dramatic price shifts for any or all consumers and may strongly impact their continued willingness

*Ibid.

Exhibit 5.10

SAMPLE FEE ASSIGNMENT SCHEDULE

(South Bay Regional Public Communications Authority)

JURISDICTION	ASSESSED VALUE 1980 (000)	% OF TOTAL	POPULATION 1980	% OF TOTAL	CALLS FOR SERVICE	% OF TOTAL	% ASSESSMENT	$ ASSESSMENT
A	$ 529,283	27.25 X .30 8.17	13,752	6.16 X .30 1.85	465,752	17.04 X .40 6.81	16.84	$259,351
B	213,435	10.99 X .30 3.30	45,165	20.25 X .30 6.07	539,747	19.74 X .40 7.90	17.27	265,965
C	315,404	16.24 X .30 4.87	56,489	25.32 X .30 7.60	528,629	19.34 X .40 7.73	20.20	311,171
D	138,035	7.11 X .30 2.13	18,070	8.10 X .30 2.43	242,933	8.89 X .40 3.55	8.12	125,014
E	289,340	14.90 X .30 4.47	32,514	14.57 X .30 4.37	366,357	13.40 X .40 5.36	14.20	218,741
F	457,020	23.53 X .30 7.06	57,102	25.60 X .30 7.68	590,524	21.60 X .40 8.64	23.38	360,078
TOTAL	$1,942,518	30.00	223,092	30.00	2,733,912	40.00	100.00	$1,540,320

NOTE: Original % figures carried to 5 decimal places but reduced to 2 decimal places on exhibit to simplify presentation and analysis. However, the number of decimal places to which % figures will be taken should be standardized and agreed upon by all member jurisdictions since that affects the size of their respective user fees.

to participate. Such incidents emphasize the need for planning during the initial development of the costing formula.

In summary, formulas which rely on a single basis such as population or actual usage can be attacked for ignoring other important considerations. Minimal fees may excessively burden small members and therefore deter them from participation. The more successful arrangements use complex formulas involving several components and weighting schemes. Key to the negotiation of successful costing formulas are (1) efforts to obtain the perspective of all member jurisdictions and (2) explicit consideration of those components which place differential burdens on certain jurisdictions and require expenses which are more properly their responsibility. Through these procedures, members will understand the issues underlying the formula itself and have the security of being able to predict future fee changes.

5.3.2 State and Federal Grants

Although funds provided by the U.S. Law Enforcement Assistance Administration (LEAA) helped start many shared communications systems (particularly in purchasing equipment), grant funds now constitute a minor source of revenue for sharing arrangements. One of the most serious problems local officials cite in the field of budgeting is to foresee the implications of federal or state grant programs. These difficulties stem not only from uncertainty about future grant funding levels, but also from a lack of knowledge about how grant administrative and policy requirements will affect programs and costs. Shared communications systems hired personnel and purchased equipment which they had to maintain once the grant funds were withdrawn.

There is no real way to eliminate this uncertainty. However, shared communications system managers can improve their appreciation of the risks involved in a particular grant by requiring a thorough analysis of grant requirements and prospects before approving its acceptance. This analysis would identify issues such as:

- how large the grant will be in the current year and in future years if funding is continued;

- how many employees the grant will add to the payroll, since they may have to be paid from local funds if the grant is terminated;
- what are the operating and maintenance costs associated with the grant program;
- what is the capability of the system's financial management system to monitor adequately state or federal monies; and
- what is the probability of grant continuation, including how continuation is to be determined and which grant may be used.

In short, while a grant may meet one or more of the system's immediate needs, there are significant issues associated with its acceptance. Too often local officials take the grant funds only to face unexpected difficulties and hidden financial demands later. The potential impact of the grant should be assessed before it is sought or accepted.

5.4 Auditing

Auditing is the process of collecting and evaluating evidence in order to formulate an independent, professional opinion about assertions made by management. The fact that periodic audits are often required by statute or the sharing arrangement's by-laws is only one of the reasons why a shared communications system would want them. Other reasons include:

- to ascertain whether financial statements present fairly the financial position and results of operations of the system in accordance with generally accepted accounting principles; and
- to determine compliance with legal provisions relating to finance.*

The first two purposes include a determination of the adequacy of accounting records and procedures and a verification of the financial prudence of the system's management. An audit having these objectives would be characterized as a "financial and compliance" or "fiscal" audit. Such audits

*E.S. Lynn and R.J. Freeman, Fund Accounting (Englewood Cliffs, New Jersey: Prentice-Hall, 1974), pp. 771-772.

serve as control devices to prevent the loss of public funds through fraud and inefficiency. However, auditing also has other purposes:

- to evaluate the effectiveness with which the system's operations and expenditures achieve its objectives; and
- to evaluate the economy and efficiency with which the system management carries out its program.

An audit having either or both of these objectives would be called a "performance" or "operational" audit. It determines whether desired results and benefits are being achieved, whether the objectives established by the system's board of directors or member jurisdictions are being met, and whether the system is achieving its objectives at minimum cost. The focus of this section will be on fiscal auditing; it will discuss (1) the selection of the auditor, (2) illustrative auditing procedures, and (3) detection of fiscal difficulties. Operational auditing will be discussed in Chapter 7 on "Evaluating a Service Sharing Arrangement."

5.4.1 Selection of the Auditor

Audits may be classified as internal or external, depending upon whether they are performed by employees of the audited organization or auditors employed by an external agency. External auditors include both officials who are members of governmental units other than the one being examined and independent public accountants who provide auditing services on a fee basis. Agency supplier types of sharing arrangements are often audited by the treasurer or business manager of the jurisdiction providing the service. A joint provision system will sometimes ask the chief fiscal officer of one of its member jurisdictions to audit its books, but will more often employ a public accountant in order to maintain the fact as well as the appearance of independence.

When contracting for the services of an independent auditor, shared communications systems should follow established procedures for securing contractual services. The National Intergovernmental Audit Forum suggests that public agencies, when contracting for audits by other than government employed auditors, "should be encouraged to engage public accountants by competitive negotiations that take into account such factors as the experience, plans, qualifications, and price of the offerer."* Price should never

*Quoted in Governmental Accounting, Auditing and Financial Reporting (Chicago: Municipal Finance Officers Association of the United States and Canada, 1980), p. 86.

be the only factor, since that imposes unprofessional pressures upon the prospective auditors and is not conducive to selection of the best-qualified.

Shared communications systems should issue requests for proposals (RFP's) to potential independent auditors. The RFP should clearly set forth the scope of the desired audit services. Exhibit 5.11 suggests the contents for an RFP that provides adequate guidance to bidders while also protecting the interests of the shared communications system needing the audit.

5.4.2 Illustrative Audit Procedures

The audit process consists of a detailed examination of specific activities or operations. Suggested by the U.S. General Accounting Office, the illustrative procedures in the following audit areas are intended to outline some of the more significant considerations in each area, but not to be all-inclusive.* Such detail is beyond the scope of this report. The audit areas discussed are: (1) procurement, (2) budget administration, and (3) financial accounting.

Procurement

The objective of a procurement audit is to determine if management obtains, at fair and reasonable prices and at the time required, the proper and needed quantity of equipment, materials, and services of a satisfactory quality. The auditor should:

- Obtain written reports of procurement actions, including requisitions, purchase justifications, requests-for-proposals, bids, sole source purchase justifications, etc., and review them prior to starting the audit. Emphasis should be given to high-price or repeat procurements.
- Flowchart and/or document the procurement transactions.
- Determine if there is adequate separation of procurement functions among employees.
- Determine if planning and priorities play a part in procurement. Are there indications of buying just to spend money? Is the procurement unit aware of management's overall plans and policies?
- Determine if an adequate inspection is performed. Is a determination made as to whether the quantity and quality of goods received is the same as that ordered?
- Determine if centralized procurement is used to take advantage of quantity prices.

*U.S. General Accounting Office, Guidelines for Economy and Efficiency Audits of Federally Assisted Programs (Washington, D.C.: U.S. Government Printing Office, 1978).

Exhibit 5.11

SAMPLE OUTLINE OF A REQUEST FOR PROPOSALS (RFP)

A. Names of Contracting Parties
   1. Include the name and address of the local government official to whom the proposal should be addressed.
   2. Request the name and address of the primary contact at the audit firm submitting the proposal.

B. Award Schedule
   1. Proposal due date.
   2. Date award will be made or vendors will be contacted for questions.
   3. Date contract begins.

C. Audit Schedule
   1. Length of audit contract.
   2. Audit periods to be covered.
   3. Earliest date that audit work may begin.
   4. Due date of auditor's report.

D. Scope of Audit
   1. Funds to be audited.
   2. Requirement of unqualified opinion of auditor or clear statement of reasons for qualifications.
   3. Financial statements and other information to be provided by governmental unit.
   4. Other services to be performed by auditor, if any.
   5. Procedures for determining adequacy of internal controls and accounting.
   6. Authorization to disclose any irregularities.

E. Auditing Standards
   1. State that the audit shall be performed in accordance with generally accepted auditing standards set forth by the AICPA in Statement of Auditing Standards, No. 1, "Codification of Auditing Standards and Procedures."

F. Auditing Procedures
   1. State that the examination shall be made in accordance with generally accepted governmental auditing procedures as prescribed in the AICPA Industry Audit Guide--Audits of State and Local Governmental Units and in GAAFR.
   2. Include a statement requiring the auditor to review the audit program with the appropriate local governmental officials.

G. Audit Report
   1. Specify the number of the copies of the audit report required, who will print the report (governmental unit or auditor), and any other specifics desired, such as size of paper, type of binding, etc.

H. Qualifications
   1. Request a summary of the qualifications of the personnel proposed to perform the audit.
   2. Request a list of recent local government audits performed.
   3. Request a summary of the specific governmental accounting and auditing training of the personnel proposed to perform the audit.

I. Compensation and Terms of Payment.
   1. Request details on hours required, current rates, and total anticipated costs for each audit.
   2. State the number of years the contract will be expected to cover.
   3. Define the terms and time of payment.

Source: An Accounting Handbook for Small Cities and Other Governmental Units (Chicago: Municipal Finance Officers Association of the United States and Canada, 1979), p. 121.

Budget Administration

The purpose of an audit of budget administration practices is to determine if management controls the utilization of resources in accordance with the approved budget and assigns appropriate responsibility for this control. The auditor should:

- Obtain copies of the formally adopted annual budget, minutes of each governing board meeting and relevant board resolutions, an organization chart including current names of persons in each position, and other budgetary materials.
- Identify whether the organization has fiscal controls which result in:
  a. Control of expenditures within the approved program plan.
  b. A management review prior to issuing budget amendments or incurring obligations or expenditures which deviate from the program.
- Determine if there is a timely, periodic financial report to management which permits:
  a. Comparison of actual expenditures with the budget for the same period.
  b. Comparison of revenue estimates with actual revenue for the same period.
- Evaluate the budget controls to determine if they exist at all appropriate levels.
- Determine if analyses and projections are made of cash flow and appropriate action is taken to maintain a favorable cash position.
- Determine if the budget is adjusted as frequently as necessary to reflect changing situations. Does the adjustment input come from those who originally designed the budget?

Financial Accounting

Auditing the sharing arrangement's financial accounting system determines if management maintains financial records on a consistent basis in accordance with generally accepted accounting principles. The auditor should:

- Obtain copies of the system's financial statements, prior audit reports, list of fixed assets, and records of financial transactions, including monthly bank reconciliations, employee contracts and leave schedules, copies of leases and other contractual agreements, and a reconciliation of salary amounts with payroll taxes, retirement contributions, and other deductions.

- Determine if the accounting system, including equipment, meets the needs of the organization.
- Determine if costs are assembled in a form that meets the needs of the organization.
- Determine if periodic internal audits are conducted, and what problems have been identified.
- Determine if corrective actions have been taken in response to audit findings.
- Determine if an adequate program for bonding is in use and is reviewed periodically.
- Review the cash balances on hand or in banks to determine if the best return is obtained.
- Determine if the accounting system is designed to take advantage of cash discounts in the purchasing of equipment and supplies.
- Evaluate whether the reports prepared are meaningful and necessary.
- Determine if the accounting system recognizes encumbrances incurred in the period but payable in another.

5.4.3 Detection of Financial Difficulties

The severe financial pressures facing local governments both promote and hinder shared communications systems. In deciding whether to start a sharing arrangement, the "fiscal crunch" is an incentive to sharing in that a shared communications system saves money and improves service, at least in the long run. These same pressures also hinder sharing, because the short-term start-up costs for facilities and equipment can be significant and beyond the capacity of some potential member jurisdictions. Even well established systems are affected by the poor financial conditions, not only because of an inability on the part of member jurisdictions to absorb increased user fees but also because insufficient funds are available to replace outmoded equipment.

Most audits will not investigate the financial capacity of member jurisdictions. They are confined to appraising the accuracy of the accounting system, the economy and efficiency of operations, program effectiveness, or some combination of factors. However, the auditor should be aware of the financial conditions and contributions of member jurisdictions, since the lack of financial resources will affect both the system's ability to implement improvements recommended in the audit report and perhaps the system's very survival.

A 1981 publication of the Municipal Finance Officers Association does an excellent job of providing a set of indicators for analyzing the financial conditions of shared communications systems and member jurisdictions.* Excerpted in Exhibit 5.12, these indicators are useful for describing current conditions and for projecting future conditions and potential problems. For example, one trend that will adversely affect any sharing arrangement is a decline in the economic vitality of member jurisdictions, since that may prevent them from paying their user fee assessment. The exhibit suggests that this trend can be identified by declines in total population, per capita income, and other specific indicators.

* * *

Chapter 5 has presented techniques for budgeting, financing, and auditing a shared communications system. These techniques are intended to enhance the economy, efficiency and, ultimately, the effectiveness of the system. Taken together, Chapters 4 and 5 have recommended a reasonably comprehensive set of guidelines for managing the system's human and financial resources. Next, Chapter 6 (Operating a Service Sharing Arrangement) will detail how these resources are used in purchasing needed equipment and handling calls for service.

*Adapted from: Is Your City Heading for Financial Difficulty? (Chicago: Municipal Finance Officers Association of the United States and Canada, 1981), developed in conjunction with Peat, Marwick, Mitchell and Company and the University of Georgia.

Exhibit 5.12

INDICATORS OF FINANCIAL DIFFICULTY

OVERALL TREND	SPECIFIC INDICATORS	POSSIBLE SOLUTIONS
Economic vitality of member jurisdictions is declining	declines in total population, per capita income, and assessed property values increases in percentage of total budgets spent on social services slowdown in retail sales	economic development program
Fiscal independence of shared communications system is eroding	growing debt burden consistent budgetary overruns in specific departments and activities rapid increase in employee fringe benefits	reducing the use of debt financing for capital needs improved expenditure controls and/or more realistic budgeting greater attention to fringe benefit costs in employee negotiations
System productivity is declining	increasing number of employees per capita population decreasing number of calls for service per employee increasing system expenditures per capita population (after adjusting for inflation) rapid increases in user fees without comparable increases in service levels	improved work methods use of labor saving technology improved employee skills increasing employee motivation better operational controls
Use of inefficient financial management practices	increasing incidence of actual revenues being less than planned increasing amounts of uncollected user fees increasing incidence of late payment of bills	better coordination with member jurisdictions use of independent auditor to analyze shortcomings and recommend solutions

Chapter 6

OPERATING A SERVICE SHARING ARRANGEMENT

The efficient operation of the sharing arrangement is probably the single most important factor in determining whether member jurisdictions are satisfied and the shared communications system is a success. The arrangement must concentrate on handling calls for service quickly and accurately and on keeping the necessary records. However, as suggested in Exhibit 6.1, system operations do not exist in a vacuum; they depend on the kind of good planning and effective management discussed in earlier chapters.

Chapter 6 examines the three core elements of operating a shared communications system: (1) choosing facilities and equipment, (2) providing services, and (3) keeping records. The significance of the relationship among these elements is demonstrated in Exhibit 6.2, which traces the path of a call for service through the components of a typical police communications system. It suggests the central role of modern telecommunications equipment in the communications system, including telephones, radios, automatic call distributors, and broadcast transmitters. Additionally, it highlights the responsibilities of dispatchers, field units, and other personnel in handling calls for service and providing effective services. Finally, the exhibit demonstrates the importance of adequate record keeping in documenting system activities and decisions at every step in the process.

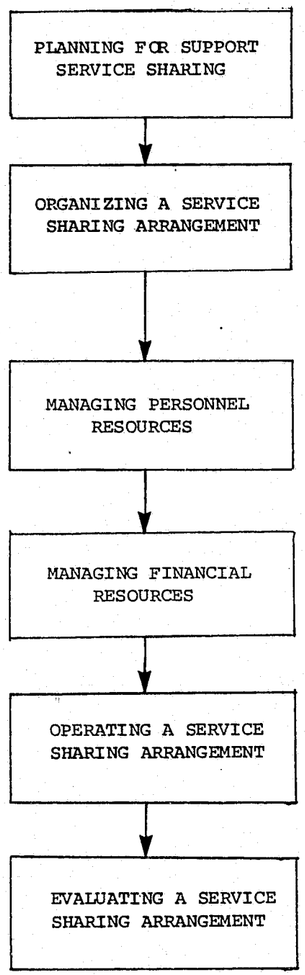
6.1 Choosing Facilities and Equipment

The choice of facilities and equipment is among the most crucial operational decisions faced by the shared communications system, affecting such dimensions as the system location, cost, and communications capabilities. At a minimum, the system will require the following:

- Communications center, consisting of the buildings and/or offices necessary to house the communications personnel, dispatching equipment, and central telephone equipment.
- Transmitter and receiver facilities, including a broadcast tower, repeater stations, if necessary, and receivers to pick up messages from patrol units' radios. Basic considerations in deciding upon the configuration of these facilities were examined in some detail in Chapter 2.

Exhibit 6.1

OPERATING A SERVICE
SHARING ARRANGEMENT



Chapter 2

- Developing Interest and Support
- Determining Type of Sharing Arrangement
- Deciding on Nature and Level of Service
- Establishing a Written Agreement
- Ratifying the Agreement

Chapter 3

- Building an Organization Structure
- Formulating a Decision Making Process

Chapter 4

- Employment Planning
- Recruiting
- Selecting
- Training and Development
- Compensation
- Performance Appraisal

Chapter 5

- Budgeting
- Financing
- Auditing

Chapter 6

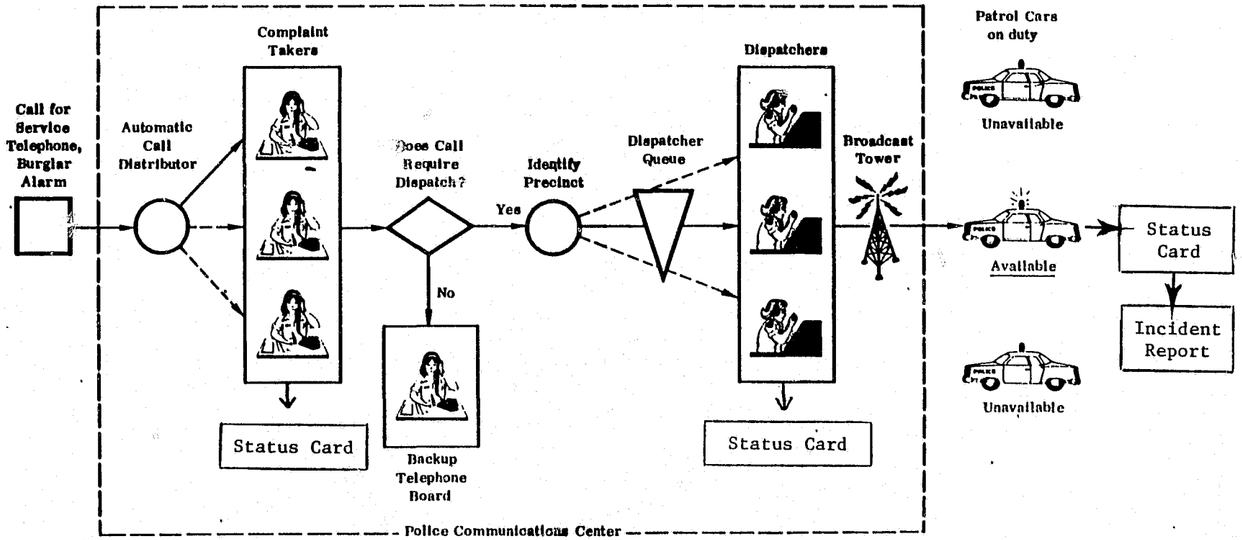
- Choosing Facilities and Equipment
- Providing Services
- Keeping Records

Chapter 7

- Measuring System Impact
- Measuring System Process
- Measuring System Costs

Exhibit 6.2

SHARED COMMUNICATIONS SYSTEM



Source: Public Technology Inc., Improving Productivity Using Work Measurement (Washington, DC: National Science Foundation, 1977), p. 104.

- Telephone equipment, including a central switchboard or rotary system, telephones linking the communications personnel to the public and other police personnel, and associated support equipment which can allow such advanced telephone services as automatic call tracing.
- Radio equipment, including the dispatch consoles and mobile radios for patrol units (ideally both car radios and portable radios for officers on foot).

In addition, many communications systems have added other equipment such as computers and recording equipment which allow them to perform the communications functions more effectively and efficiently.

Depending on the existing capabilities of member agencies, cost considerations, and the type of sharing arrangement established (joint provision or agency supplier), shared communications services have several options for acquiring their basic facilities and equipment. Under some circumstances, a shared communications arrangement may be established with minimal purchase of new facilities and equipment. For example, when one large agency supplies services to much smaller agencies, the large agency's communications center may be able to absorb the extra workload without renovation or expansion. Furthermore, if the smaller agencies' radio equipment is already compatible with that of the larger agency, then the smaller agencies will not have to purchase new equipment either.

However, establishment of shared communications services will often require acquisition of new--or improvements to existing--facilities and equipment, as discussed in Sections 6.1.1 and 6.1.2. Moreover, by pooling financial resources and taking advantage of economies of scale, small police departments may be able to afford more sophisticated equipment than they would be able to afford separately. For this reason, this chapter examines both relatively modest arrangements and some of the sophisticated technology which is available for police communications systems.

6.1.1 Communications Center

While all shared communications systems must establish a communications center, choices concerning the facility design and location are typically constrained by the type of shared service established. As has been mentioned, in the agency supplier model, the communications center will usually be the existing dispatch room of the supplying agency. For example,

the Closter Police Department, in Bergen County, New Jersey, uses its own facilities to provide radio communications services to the smaller Demerest Police Department.

Under the agency supplier model, some minor expansion or revision of existing facilities may be required. For example, the center may need more space to house new radio equipment or additional dispatchers. Contributions of the consumer agency to the operations budget of the center may also allow the supplier agency to renovate its facilities to allow for better security or improved placement of work stations. For the most part, however, the location, size, capacity, and general design of the communications center are limited by the characteristics of the supplier's existing facility. Still, these limitations are usually offset by the considerable cost savings realized in using an existing facility.

In contrast, when several communities of comparable size establish joint provision of communications services, a renovated or entirely new dispatch center will be necessary if the size of the shared arrangement exceeds the capacity of any of the participating departments. For example, if five communities with populations of approximately 30,000 each decide to share communications services; their shared communications center will serve a population of approximately 150,000. It is unlikely that any one of the participating jurisdictions will have existing facilities large enough to handle such a greatly increased workload. It will be necessary either to expand an existing facility or to construct a new communications center.

Although considerable investment may be required to convert an existing facility and will certainly be required to construct a new facility, conversion or new construction can provide a unique opportunity to develop an efficient, modern center tailored to the specific needs and requirements of the local communications system. Centers designed with the following general principles in mind can ensure that inconveniences such as overcrowding or expensive remodeling are avoided.

Central location

All other things being equal, a centrally located communications center will be most convenient. Dispatchers living in all the participating communities will have equal access to work, and such tasks as daily pick-up of records by member departments will be facilitated.

Safe location

The location of the center and related field base stations must also consider the potential for flooding, rail and industrial accidents, fire, and other hazards which can impede or interrupt system operations.

Capacity for expansion

Future expense and inconvenience can be avoided if the communications center is designed with capacity for expansion of services or addition of new members. Such capacity might include space for additional equipment or extra parking spaces to accommodate new employees. The floor plan of the communications center of the South Bay Regional Public Communications Authority (Exhibit 6.3) provides an example of planned expansion combined with ad hoc adjustment. As the exhibit shows, the room was designed with 5 telephone consoles, 5 radio consoles, including one for a supervisor, and an emergency reporting system to monitor calls from street call boxes. Space was reserved for one additional telephone console and one additional radio console. Over time, some modifications have been made in the facility's use. For example, the emergency reporting system has been dismantled since it produced mainly false alarms, and is currently being replaced with a dispatch console. A second new dispatch console is being installed in the space reserved for it. Because the original design allowed ample space for modification and expansion, South Bay has been able to respond effectively to changing requirements for service from the participating jurisdictions.

Security

Security is important for the safety of employees and also to ensure continuous provision of service. As part of the police system, the dispatch center may be subject to threats whether or not it is located in a police station. Although procedures are crucial in maintaining security, facility construction is also important. The Muskegon Central Police Dispatch (Exhibit 6.4) offers an example of a communications center designed for security. The center is located below ground, behind locked doors which are monitored by closed circuit television. Another locked door separates the reception area from the operations area. Both the underground construction and the location of the reception area between the entrance and the operations area contribute to the security of the center.

Back-up

In addition to security from human threat, the communications system must be secure from natural disasters and equipment failure of any type.

Exhibit 6.3

DISPATCH ROOM FLOOR PLAN
(South Bay Regional Public Communications Authority)

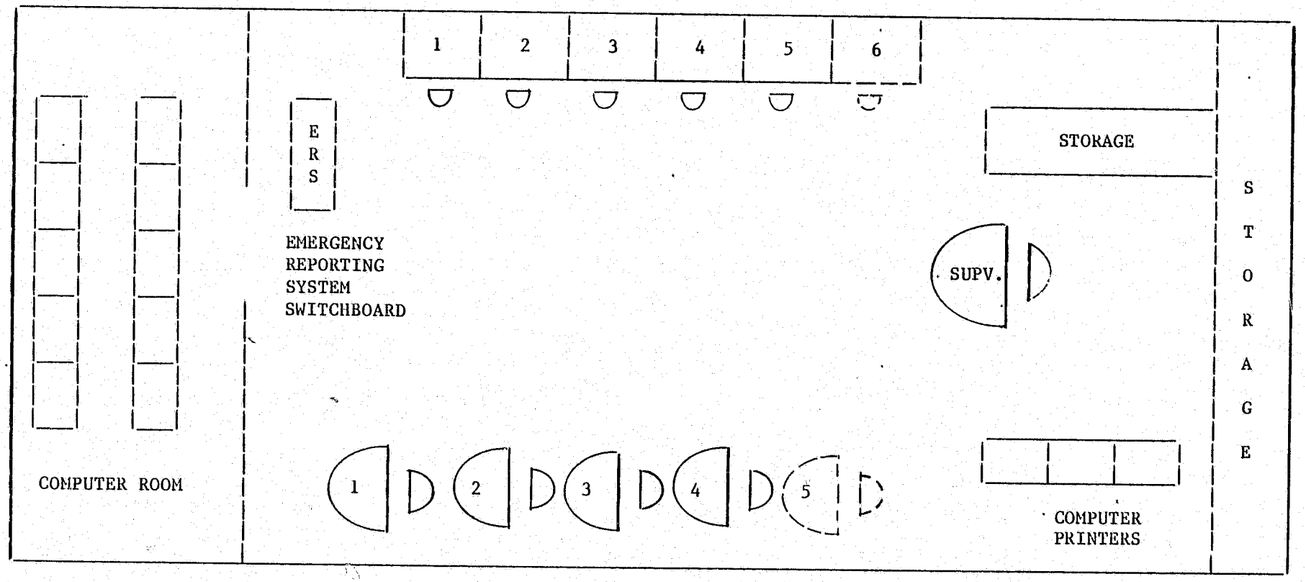
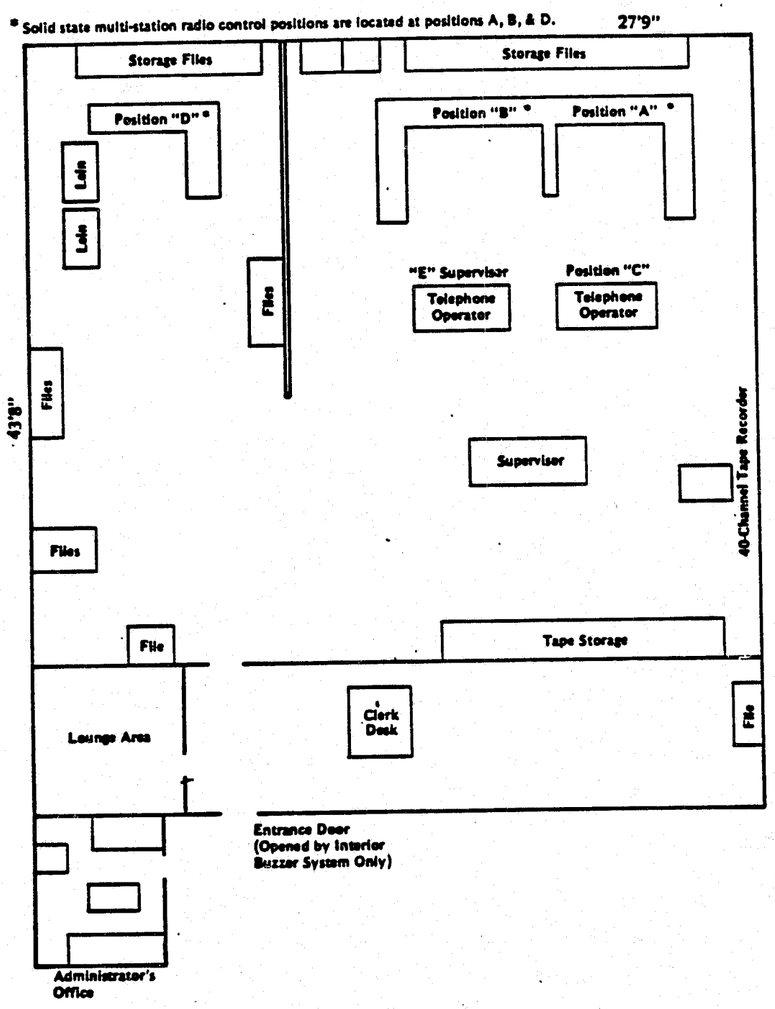


Exhibit 6.4

CENTRAL DISPATCH COMMUNICATION CENTER
(Muskegon Central Dispatch)



Source: National Institute of Law Enforcement and Criminal Justice, Central Police Dispatch: An Exemplary Project, p. 27.

Back-up facilities must be available for the shared communications center. These can be provided in several ways: as back-up for the communications center, member departments may maintain their original, separate equipment for use in case of equipment failure; in an agency supplier model, member departments might arrange to join the state or county police communications system in such an emergency. As back-up for the radio facility, it may be practical to maintain a separate facility, for example, at a repeater station; or member departments may maintain their own equipment; or the radio facility may be backed up by the state or county system.

Efficiency

Finally, planners must consider the patterns of use and activity when designing the center and equipment layout. For example, frequently used files should be located near the people who use them, and busy paths should be kept free of obstructions. In addition, the demanding nature of police dispatching requires an environment free from distractions. A lounge area will allow employees to take coffee or lunch breaks without distracting employees who are on duty. Individual lockers will permit employees to keep personal belongings safely out of the way and will allow them to be responsible for personal equipment such as radio/telephone headsets.

The experience of the Northwest Central Dispatch System (NWCDS) in Illinois illustrates several of these considerations. NWCDS began operations in part of a centrally-located police station, with dispatchers and equipment contributed by the four member police departments. In addition to the fact that some of the equipment contributed was mutually incompatible, dispatching operations were frequently disrupted by police personnel. Eventually, NWCDS was able to convert the entire building for use as a communications center, an arrangement which has proved much more satisfactory.

6.1.2 Transmitter and Receiver Facilities

Complementing the communications center facilities are the external facilities necessary for radio communications, including a transmitting station with a transmitter and tower, repeater stations to extend the range of the main transmitter, and receiver stations to pick up messages from mobile radios. Many of the design considerations we have mentioned in regard to the communications center are also important when considering the system's radio transmitter and receiver facilities. While a central, accessible

location is ideal for the communications center, the overriding geographical consideration for the transmitter facility is effective transmission of radio messages. If the area's topography is relatively large and uneven, with hills and valleys obstructing radio transmission, repeater stations may be necessary to pick up and re-broadcast messages, eliminating "dead spots."*

Since mobile radios send a weaker signal than the main transmitter, typically it will be necessary to establish receiver facilities in several locations to pick up patrol officers' radio messages. On the other hand, if the area's topography is relatively small and even, one transmitter may be able to reach all patrol units in the area. Small geographic areas could utilize "simplex" systems (non-repeater, single frequency channels) and still achieve coverage equal to that of a repeater station. Simplex systems can also utilize satellite receiver systems for extended portable communication. Thus, the location of radio facilities should be determined by the requirements for effective transmission and reception of radio messages. This location must be considered independently from the location of the shared communications center which should ideally serve the convenience of the member departments. A typical arrangement might place the communications center near the main police station in a centrally located member community, with the radio transmitter on a hill outside of town and several receiver stations located throughout the area served. Under such an arrangement the radio facilities and the communications center would be linked by telephone lines or by radio.

Capacity for expansion is also an important consideration for the radio facilities. Transmitting strength is a combination of the power of the transmitting equipment and the height and location of the transmitter and repeater towers. Ideally, the original design of the transmitter station should provide sufficient strength to reach potential participating areas. However, if the terrain precludes use of a single facility, or if the original facility has insufficient transmitting power, it should be possible to reach new areas using repeater stations.

*The use of repeater stations to reduce dead spots can add to frequency congestion. It takes two radio frequencies to make one repeater channel. This cuts the available radio channels in half (i.e., 50 radio frequencies available with channel loading of 30 units per channel = 1,500 unit capability; 25 repeater channels with a loading of 30 units per channel = 750 unit capability.

Security and back-up are just as important for the radio facilities as for the communications center. Security for radio facilities requires locked doors and sturdy construction. In addition, police radio facilities should be separate from radio facilities used for other purposes, such as dispatching garbage trucks or taxis, so that access to the facilities may be limited to police communications staff.

The type of system selected for back-up will depend on the type of sharing arrangement and also on the resources available. In a joint provision arrangement member agencies may maintain their original, separate equipment. In an agency supplier model, member departments might use the state or county radio system as back-up. In either arrangement, a separate transmitter may be maintained for back-up--perhaps at a repeater station--if sufficient resources are available.

Receiver stations should be located so as to cover overlapping areas in order that in the event of failure of one receiver station, radio messages would still be received by at least one other station.

6.1.3 Equipment

As has been mentioned, it is possible to establish a shared communications system with minimal acquisition of new equipment. For example, the eight agencies which combined to form the Muskegon Central Police Dispatch in Michigan were already operating on the same frequency, though separately. Consequently, they were able to centralize operations with minimal expenditures for new equipment.* On the other hand, agencies using incompatible equipment, such as those which combined to form NWCDS, will find it necessary to purchase new equipment in order to establish shared communications. For example, if the participating agencies have been operating on different frequencies, new equipment would include radios capable of using all the frequencies available to the combined system. Furthermore, pooling financial resources in a shared communications system will enable police departments to purchase sophisticated equipment which they would not be able to afford separately. This possibility may be one motive for establishing a shared communications system. Discounts for bulk purchasing may make such investment even more attractive. This section presents some of the options in telephone, radio, and computer equipment.

*National Institute of Law Enforcement and Criminal Justice, Central Police Dispatch: An Exemplary Project, p. 27.

Telephone Equipment

Within any communications system the specific functions of the telephone system are to link the police with the public and with other agencies, such as fire and emergency medical services. A telephone system in a sharing arrangement performs the same functions, using equipment and staff located at the shared communications center. Moreover, a shared telephone system links its member departments with each other and with the communications center. Typically, the center leases equipment and obtains a maintenance contract from the telephone company. In addition to the basic telephone equipment, communications centers may make use of special services and equipment (such as hard wire and direct open telephone connections) to provide faster communications and better service. For example, the many components of the NWCDS telephone system are depicted in Exhibit 6.5.

The basic equipment needed to link the public and the communications center is the ordinary telephone which can be used individually or, in a computer-aided dispatch system, as part of a "complaint console" with headset, recorder, and CRT/keyboard terminal. In addition, emergency callboxes on the street may automatically connect to a special switchboard at the communications center. Some communities have found such callboxes useful, but others (such as the South Bay Regional Public Communications Authority) have found them to produce mostly false alarms.

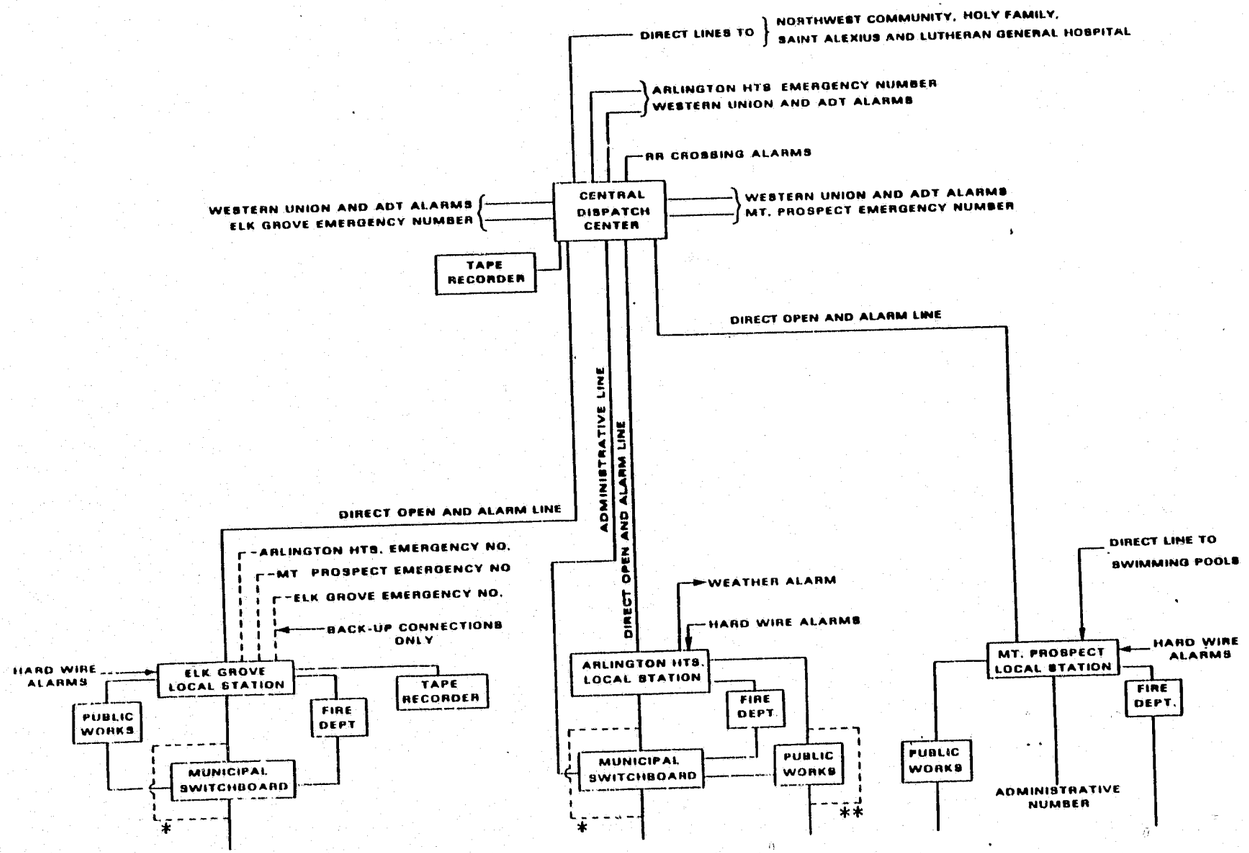
Within the communications center a one- or two-digit intercom system will facilitate communications without requiring any sophisticated equipment. This system would allow a supervisor, for example, to telephone an operator or dispatcher without having to use a full seven-digit number. With automatic dialing, the same convenience is available for frequently used outside numbers such as member departments or local hospitals. This option requires a panel like an expanded push-button phone panel, allowing 30 or more numbers to be reached by one or two digits.

Internal police communications must not be obstructed by busy telephone lines. Free lines can be ensured by maintaining unlisted numbers for internal use. Unfortunately, these lines tend to be used by staff for personal calls. To avoid this problem, more expensive hard-wired "hotlines" can be installed

Exhibit 6.5

TELEPHONE SYSTEM

(Northwest Central Dispatch System)



between member departments and the communications center. Since these lines can only be used for interagency calls, they will ensure ready access to speedy communications between departments.

Several special services are available from the telephone company to facilitate communication between the public and the communications center. A "rotary system" allows the communications center to eliminate a switchboard to receive incoming calls. A rotary system can be economically equipped with automatic call distribution and automatic "call hold" features which will hold a call if all operator positions are busy. The first available position clearing a call receives the call being held.

In addition, many communities are currently implementing the "911" system. Rather than dialing a full seven-digit number, citizens needing emergency services may dial a simple, universal three-digit number--911. This number is easy to remember and quick to dial. Calls are either received at a central location such as the dispatch center, or may be routed to separate dispatch centers according to the origin of the call or the nature of the service provided (fire, emergency medical, or police). The fewer the jurisdictional boundaries within the 911 region, the less expensive the service will be to the participating departments.* Consequently, this service is especially appropriate for regions establishing shared communications systems.

In jurisdictions which have already installed a "911" system, several other services can be made available which can be of particular value to communications center operators. "Automatic Number Indication" (ANI) and "Automatic Location Indication" (ALI) provide the phone number and address from which incoming calls are made. Since 80 to 90 percent of incidents resulting in calls for service occur at the address from which the call is made or within a few doors of that address,** this information can be crucial, especially when the caller gives a mistaken address or, for some reason, cannot provide the address. With a service called "Called Party Hold," the operator can trace a call even after the caller has hung up. These services require leasing a telephone company operator, obtaining a printer, and expanding telephone button panels.

*National Criminal Justice Information and Statistics Service, U.S. Department of Justice, Multi-Community Command and Control Systems in Law Enforcement: An Introductory Planning Guide, by R.L. Sohn, E.A. Garcia, and R.D. Kennedy (Pasadena, Calif.: California Institute of Technology Jet Propulsion Laboratory, 1976), p. 24.

**Ibid.

Since it is necessary to know the location of an incident before it is possible to send help, these services would enhance the effectiveness of any police department. However, ALI is especially helpful in a shared communications system serving a large area complicated by jurisdictional boundaries. Most police departments prefer to have their officers answer calls for service within their own jurisdiction whenever possible. ALI provides dispatchers with the information necessary for such selective dispatching. In addition, ALI can alleviate confusion caused by duplicate street names or numbers in neighboring towns.

Another feature which is available to communications centers is a display-phone system for the deaf. This equipment enables deaf persons to call for emergency service. The Consolidated Dispatch Center uses such a system to serve over 3,000 deaf persons in the Flint, Michigan area. Called a "TV-Phone System," their unit consists of a typewriter keyboard attached to a regular phone and a TV monitor. Dispatchers are alerted to messages coming in on the TV monitor by a beeping tone.*

As argued in Section 6.1, security requires some form of back-up for every element of the communications system. Member departments may wish to maintain their own telephone equipment to back up the equipment in use at the communications center. In case of failure at the communications center, the telephone company can reroute calls to the appropriate station according to their origin. In case of complete telephone failure, internal police communications can take place by radio.

Radio Equipment

Within the overall communications system, the radio system permits communication between the communications center and police on patrol, and also permits police on patrol to communicate with one another. The basic equipment needed for these functions includes the transmitter and receivers (discussed in Section 6.1.2), mobile radios, including car radios and personal radios for officers on foot, and radio consoles for dispatchers.

When establishing a shared communications system, police departments have three options with regard to radio equipment. First, each department may continue to use its existing equipment and operate more or less

*R.A. Page, "How 21 Police Agencies Co-Operate with Total Communications," Law and Order (February, 1975), pp. 33, 36, 38, 40-41.

independently, while sharing other elements of the communications system. This option may be chosen if member departments are satisfied with their own radio equipment and want to use the sharing arrangement for its telephone operators and equipment or to access better communications facilities. Maintaining separate radio equipment saves money and may be useful as an intermediate arrangement in implementing a fully shared communications system.

Second, member departments may standardize equipment and combine operations. This option would require converting or replacing transmitting and receiving equipment as well as mobile radios and dispatchers' radio consoles so that they can operate on shared frequencies, improving allocation of radio time. An advantage of this option is that some equipment already owned by member departments may be retained for use in the shared system, reducing the expense of establishing the sharing arrangement.

Finally, a shared communications center may be able to afford advanced equipment which would be too expensive for the member departments separately. For example, several shared communications systems have taken advantage of their improved purchasing power to purchase digital radio equipment, reducing congestion by reducing voice traffic and increasing the capacity of available channels. A digital radio system resembles an advanced Morse code system. Specialized equipment is required both to receive and to transmit digital messages. Messages are entered on a keyboard and unscrambled by computer. In addition to the usual radio equipment, a patrol car equipped for digital traffic would also have a mobile digital terminal (MDT) consisting of a keyboard for entering messages and a display screen for receiving messages. The MDT used by the South Bay Regional Public Communications Authority currently costs about $5,000, including installation and required radio equipment. While a digital system may seem cumbersome in description, in practice its oustanding advantage is its ability to carry more information than voice traffic can handle.

Another advanced option for radio equipment is the type of dispatch console also used by South Bay. All radio channels can be accessed from each console although it is common practice to assign fire emergencies in all member jurisdictions to one console and to dedicate each additional console to one of the primary police dispatch frequencies assigned to member jurisdictions. When a police complaint is entered by a complaint operator at a

separate console, it is automatically routed to the appropriate dispatcher (based on the assignment of member jurisdictions to a dispatch position). South Bay's dispatch consoles consist of two CRT screens and a keyboard for operator interaction with the computer-assisted dispatch system, a radio control panel, a playback recorder, and a 60-button telephone. Operation of both telephone and radio is by a separate headset. In addition, each console has a special keyboard terminal for instant access to city and county computer records.

Recording Equipment

All incoming emergency telephone calls and all radio transmissions should be tape recorded. Tapes can be replayed to confirm pertinent data when a dispatcher cannot understand what the caller is saying, due to hysteria or garbled transmission. In addition, tape recording incoming calls allows supervisors to monitor the methods used by dispatchers in handling calls for service. Tapes can be used to protect system personnel from unfounded complaints about their telephone methods or manner. As the Director of the Onondaga County, New York communications system explained:

> The tape has found us guilty of some lapses in our procedures, but more important, it proves the efficiency of our system and controllers. For example, a woman called the other day to complain that it took 45 minutes for a car to reach her after she reported a prowler. In truth, it took four minutes, which we proved by replaying the tape. Because we can time everything within a few seconds of when it happened, the tape is also admissible in court.*

Computer Equipment

In general, the larger and more complex the communications system, the more useful computerization will be. The advantage of computerization is the capacity to handle large amounts of information quickly and accurately, while the advantages of manual procedures are low cost and simple operation. Although computerization requires higher investments in equipment and training, it may become worthwhile when the volume of information makes manual procedures cumbersome and inadequate. Since a shared communications system often becomes large and complex, its use of computers to increase automation and speed information flow may be particularly appropriate.

---

*Charles E. Gabriel, "Onondaga County Police Agencies Make Mobile Radio District Idea Work," Law and Order (February, 1975), pp. 42-47, 51.

Computerization can enhance virtually every function of a communications system, from receiving calls to keeping records.

We have already mentioned radio channel assignment and Automatic Number/Location Indicator (ANI/ALI) as examples of computerization in radio and telephone equipment. In addition to enhancing the capabilities of equipment, computerization can also take over some of the routine functions performed by dispatchers. This option is known as "Computer-Aided Dispatch" (CAD). Using mobile digital terminals, patrol officers may enter status and location reports directly into the computer rather than reporting to a dispatcher. The computer may use this information to select the appropriate patrol units for dispatch, or may simply display this information for dispatchers to use.

Computerization also reduces the labor necessary in keeping records, since information, once entered, may be retrieved in a variety of ways. This feature is especially useful for shared communications systems in which each member department requires records of the activities of its own forces only. A computerized records system can produce selective reports for each department.

A logical start toward the development of a computerized communications system is to establish a master plan. The steps in forming this plan include:

1. Calculate the volume and usage of information, giving consideration to anticipated growth. Distinguish between information needed to support operations (street locations, patrol routes, wanted persons and property, etc.) and information with management and administrative applications (manpower allocation, budgeting and accounting, etc.).
2. Based on how much of the information will be computerized, determine itemized equipment needs. In addition to the main computer hardware, a backup computer or a back-up manual system should also be available. Operators must have keyboards on which to enter information and display screens on which to retrieve information. A printer will be necessary for producing hardcopy reports. Mobile digital terminals will enable patrol units to enter and retrieve information as well. Finally, a console at each member department will provide members with immediate access to information stored in the computer and enable them to monitor dispatching activities.
3. Compute the personnel, time, and cost requirements of each step in the conversion process from manual to computerized data processing. These steps include system design, programming, conversion of existing data, and the testing, implementation, and de-bugging process.
4. Document and submit the developed master plan for review and approval by the system's governing board or, in the case of an agency supplier system, to executive and legislative authorities.

In implementing the master plan, shared communications systems usually purchase computer equipment from a vendor through a competitive bidding process. The system will also pay for a maintenance contract on a yearly basis. As discussed in Chapter 2, part of the technical study produced in the planning phase of the shared service arrangement will be a section listing new equipment needed in a manner suitable for competitive bidding. To design these specifications for bidders, police agencies may use their own technical staff, hire a private consultant, or obtain technical assistance from computer manufacturers.

The type of computers needed will depend on the size and requirements of each communications center. However, bid specifications should at least require that new equipment be compatible with any equipment already owned so that information can be easily transferred. In addition, computer equipment should be selected which has capacity both to handle a larger volume of information should more departments join the communications center, and also to handle additional functions.

The public safety radio dispatch facility of Baltimore County provides an example of a Computer-Aided Dispatch (CAD) facility. The facility has two computers (DEC PDP 11/70 CPU's), one on-line and one off-line in a stand-by mode for back-up. Each computer has a high-speed printer. The facility has 20 terminals for operators receiving calls, each with a display screen split into three parts: the top third contains a standard incident entry format; the center third displays the ten most recently received incidents as a check against duplication, and the bottom third is a message entry display area. An additional terminal is located in the office of the Chief of Communications Services. Eighteen terminals for dispatchers (10 police, 6 fire, 2 ambulance) have two display screens. One screen duplicates the display for operators and the second screen lists incidents awaiting dispatch in the top third, leaving the bottom two thirds for unit status and location. Additional interactive terminals and printers are located at County Police

and Fire headquarters, providing links to CAD for informational and operational purposes.*

6.2 Providing Services

This part of Chapter 6 examines the implications of sharing for handling calls for service. First, it discusses the major influence on a shared communication system's scope of services: the choice of the number and types of calls that the system will handle. This choice will affect the size, equipment needs, and procedures of the agency. Second, it explores the effects of sharing on telephone procedures, including rules governing the use of telephone lines, standard language, and the standard information which should be obtained from every caller. Third, it examines the effects of sharing on radio procedures, including rules governing the use of radio channels, specialized radio language, and priorities in dispatching patrol units.

6.2.1 Scope of Services

Two kinds of choices determine the scope of a shared communications system: the percentage of each member department's calls handled by the system and whether the system will handle only law enforcement calls or all emergency calls. A shared communications center may handle all or only some of the calls for service of its member agencies. In part, the first issue--percentage of calls handled--is related to the type of sharing arrangement established. In most jointly operated communications services, the center handles all incoming calls for service from member departments on a 24-hour basis. Individual departments assume responsibility for calls only as a back-up in the event of central system failure. Under the agency supplier model, however, consumer departments may choose among several options. For example, a small police department might use the communications services of a larger agency only as a back-up in case traffic becomes too heavy for its own communications center. In a system such as this, incoming calls could automatically be transferred to the larger agency if they are not answered after a few rings. A small police department might also use the services of a

*Robert Benson and Charles F. McMorrow, "Baltimore County Gets New Central Communications Center," Communications News (October, 1980), pp. 40-41.

larger agency to handle all calls during periods of light traffic such as the weekday "graveyard" shifts from midnight to 8 a.m. With this arrangement all incoming calls would automatically be switched to the larger agency during specified periods. Both these arrangements would permit the smaller agency to save money on additional employees and still handle most of its own calls, while the larger agency could provide coverage at little marginal expense.

Besides deciding the percentage and timing of coverage extended to member police departments, a shared communications system must decide whether to handle calls for fire and emergency medical services. One alternative is to have separate emergency numbers and separate dispatch centers for each type of emergency service. Even under this arrangement, some coordination will be required: first, citizens in need of emergency services are sure to call the wrong number some of the time. Second, many emergencies require more than one type of service. For example, an automobile accident in which people are injured will require both police and emergency medical services. Another alternative is to have just one emergency number (such as 911), so that all emergency calls reach a single intake center. This may be the dispatch center also, or separate dispatch centers may exist for different jurisdictions or different types of service. For example, in Sumter, South Carolina, all emergency calls reach the police dispatch center on the 911 number. Dispatchers relay calls for fire and ambulance services to the respective dispatch centers and then monitor the calls until they determine whether police assistance is needed. In some communities, a police unit routinely accompanies any fire or ambulance response. In this case, coordination of dispatch services will be essential and sharing of services may be the simplest procedure. Many communities find that the same considerations which lead to consolidating police communications--reduced radio congestion, increased efficiency, and economies of scale--lead to including fire and emergency medical services as well.

6.2.2 Telephone Procedures

Telephone procedures for most police departments are basically

similar, involving decisions on use of telephone lines, language, and standard information to be obtained from callers. Some variations in procedure do occur between departments due to differences in the telephone or dispatch equipment used or differences in the size and character of the community served. However, the main task in establishing telephone procedures for a shared communications system is not so much to develop a new system as to reconcile and standardize the procedures of the member departments to ensure that the methods will meet both the individual needs of the member departments and the special needs arising out of the multijurisdictional nature of the service.

Two areas of particular concern arise in the shared communications system. First, many shared systems draw their personnel from member departments. Retraining on the standardized procedures can be critical to ensure uniformity of approaches. Operators must not only try to obtain crucial information from every caller, but must ask questions in a prescribed order of priority and relay that information to dispatchers in a uniform order, using standardized language. Variation from standard procedure can lead to confusion and mistakes. A second consideration that requires special attention in a shared system is determination of the location of the caller; if the center serves several towns, operators and dispatchers must be aware that locations such as "behind the high school" or even "29 Main Street" may be ambiguous.

Receiving emergency calls can be stressful and confusing. Clear and explicit procedures for operators to follow will relieve some of the stress and minimize confusion so as to protect the safety of both citizens and police. These procedures should be part of a training program and should also be included in an operating manual. The following procedures are fundamental:

- Answer promptly.
- Identify the agency.
- Find out the nature of the problem.
- In the absence of ANI/ALI, ask the caller's phone number and address.
- Remain courteous.

- Write down all information or enter in computer.
- For in-progress or just-occurred calls, keep the caller on the line until the patrol unit has arrived.
- Calm the caller and assure him/her that help will be on the way as soon as possible.

The operating manual should also include specific instructions for special types of calls such as domestic disturbances, bomb threats, and burglaries. These instructions will ensure that the operator asks all of the pertinent questions. Exhibit 6.6 contains sample instructions used by NWCDS for handling calls reporting homicides or suicides and serves to illustrate the level of detail necessary in the operating manual.*

Many shared communications centers handle calls to several numbers--for example, calls to the police emergency, fire emergency, and administrative numbers. Procedures should be developed to ensure that the lines likely to carry the most urgent calls are answered first.

Even on emergency lines, operators will receive many calls for non-emergency services. Citizens have been known to call emergency numbers for referrals to social service agencies, for street directions, or even just to have someone to talk to. A notebook listing community resources will enable operators to refer these calls appropriately provided that the workload does not preclude taking time to make such referrals.

6.2.3 Radio Procedures

Clear radio procedures are extremely important to promote efficient communication and ensure the safety of patrol officers and citizens. Radio procedures include the use of different frequencies for different types of traffic, the specialized language used for radio communications, the choice of unit to respond to an incident, and response priorities depending on the level of urgency of each incident. Unlike telephone procedures, radio procedures may be profoundly affected by the development of a shared communications system, since reallocation of frequencies may be part of the reorganization required in establishing a shared communications system. In addition, specialized language, response priorities, and unit selection must be

*Northwest Central Dispatch System, Operating Manual, OPS-6, pp. 23-24.

Exhibit 6.6

HOMICIDES AND/OR SUICIDES
(Northwest Central Dispatch System)

There are certain points of information that should be obtained and recorded on the complaint card in addition to the routine information; they are:

1. Call back number and the exact location. Where the caller is calling from.
2. Follow ambulance assist procedure in determining the basic nature of the injuries and in dispatching fire and police units.
3. Qualify the complainant--are they an eye-witness, concerned citizen, or possibly an offender? (ask these questions!)
4. Keep the caller on the line and continue asking questions in an organized manner as to what happened; ask specific questions as to weapons as in domestic disturbance procedures.
5. Record all pertinent information and keep units posted.
6. Give the caller specific instructions about protecting the scene and physical evidence.
7. Notify the watch commander and the NWCDS Supervisor.
8. Never assume that a suicide is only a suicide. Let the officers make the proper determination after completing their preliminary investigation. Many reported suicides are actually homicides!
9. The proper terminology should normally be "check on a suspicious death at 263 Linden; holding caller on line; Fire Department en route."
10. If further advice or direction is required, consult your NWCDS Supervisor.

standardized to minimize confusion, to meet the needs of each department, and to meet the new requirements of a multijurisdictional system.

For example, when NWCDS was established to serve four police departments in Illinois, channel loading was cut in half by splitting radio traffic among four channels according to department and type of traffic. The new arrangement was the following:

Channel 1. All normal traffic for Elk Grove Village and Mount Prospect Police Departments.

Channel 2. Extra channel for stake-outs, crime scene direction, and non-essential car-to-car traffic for Elk Grove Village and Mount Prospect Police Departments.

Channel 3. All normal traffic for Arlington Heights and Buffalo Grove Police Departments.

Channel 4. Extra channel for stake-out, crime scene direction, and non-essential car-to-car traffic for Arlington Heights and Buffalo Grove Police Departments.*

NWCDS also provides an example of standardized language in a shared system: NWCDS established standardized four-digit identification numbers for the patrol units of each member department in which the first digit identifies the department and the second digit identifies the type of unit (regular patrol unit, second unit in a beat, traffic unit, etc.). This consistent numbering system prevents the confusion which would arise from different departments using duplicate identification numbers.

Two particularly important issues in formulating radio procedures are: which patrol units to dispatch and what priority to assign to the call.

- Patrol units. Generally, police departments prefer to have their patrol units respond to incidents within their jurisdictions. Dispatchers must heed this preference in choosing the unit to respond to an incident, but in urgent situations the primary consideration should be the same in a shared system as in a single jurisdiction communications system: the nearest available unit should respond. To facilitate prompt and accurate dispatching, many communications systems provide their operators with geocoded reference guides (either manual or computerized) which list the patrol district and beat covering specific street addresses and common buildings. An example of such a reference guide is in Exhibit 6.7.

*NWCDS, Operating Manual, OPS-1, p. 4. Channels 2 and 4 are "non-repeat" channels. Units can communicate directly with each other, and the radio operator at NWCDS cannot hear their transmissions. However, transmissions by the operator on Channels 1 and 3 can also be heard on Channels 2 and 4.

Exhibit 6.7

DISPATCH REFERENCE GUIDE

(Northwest Central Dispatch System)

NORTHWEST CENTRAL DISPATCH SYSTEM
Street-to-Beat/District Reference Guide

ELK GROVE VILLAGE

BOX#	STREET NAME	FROM/TO (address run info)	BEAT#	DIST#	MISC
10	Haar Lane	All	2140	10	
10	Haise Court	1487 - 1491	2140	10	
10	Haise Lane	1410 - 1507	2140	10	
9	Halo Drive	All	2132	9	
10	Hampshire Drive	1647 - 1794	2140	10	
7	Harmony Lane	201 - 270	2136	7-9	
8	Hartford Lane	924 - 1158	2136	8	MA
7	Hastings Lane	19 - 175	2138	7-10	
10	Hawk Lane	All	2140	10	
10	Helen Lane	All	2140	10	
8	Hemlock Drive	1201 - 1261	2136	8	
8	Hickory Lane	1059 - 1198	2136	8	
8	HIGGINS ROAD (RT 72)	000 - 1699 E	2134	8	
9	HIGGINS ROAD (RT 72)	1700 E - 2800 E	2132	9	
9	OLD HIGGINS ROAD	2731,2825,2835 E	CCSPD	9	
9	OLD HIGGINS ROAD	2751 E - 2777 E	CCSPD	9	
9	OLD HIGGINS ROAD	2801 E - 2869 E	CCSPD	9	
9	OLD HIGGINS ROAD	2901 E - 2971 E	CCSPD	9	
8	HIGGINS ROAD WEST	53 - 290, Between	ISP#3	8	
8	" " "	A.H. Rd & Forest Preserve	"	8	
10	Hodlmair Court	1484 - 1488	2140	10	
10	Hodlmair Lane	1397 - 1490	2140	10	

NOTES:
MA=Medical Alert -- See pink section for address and details.

12/13/82 vls

- Dispatch priority. The shared communications system will often be in situations where the number of calls for service exceeds the system's capacity to respond immediately to all calls. In some systems, priorities must be established among the types of calls. These will determine how fast a patrol unit should be expected to respond to each incident type during periods of peak demand. Exhibit 6.8 indicates the priorities that the South Bay Regional Public Communications Authority accords to various incident types. In other systems, patrol units are simply not dispatched to respond to lower priority calls and the callers are invited to phone in their report or visit their local police station.

Ideally, all radio procedures will be uniform in a shared communications system. However, departments of different capacities may need to handle calls for service slightly differently. For example, officers of the city police department may be able to expect a back-up unit within a couple of minutes while the county police officers may have to wait fifteen or twenty minutes. Or, some jurisdictions in a sharing arrangement may insist on dispatching to 100% of the incoming calls whereas other jurisdictions in the same arrangement want to dispatch a patrol unit, in the view of one police chief, "only after the third shot is fired." Dispatchers must take these differences into account in choosing the unit to respond and also in setting response priorities. Under these circumstances, the important thing is to discuss differences and agree on solutions.

6.3 Keeping Records

Operations of the communications center--and the sharing arrangement as a whole--depend on the establishment of an accurate and workable communications records system. Basic information should be collected on the duration, content, responses, and personnel involved in each telephone and radio transaction. Using records, dispatchers can monitor the status and location of patrol units, complaint board operators can transfer calls to dispatchers, and each new shift coming on duty can learn what has occurred during the previous shift. Thus, records are crucial not only for the communications system, but for the daily operations of the patrol force as well.

In this section, we (1) examine the options available to shared communications systems in operating the records system, (2) explore the applications of records systems for ensuring accountability, and (3) study how records can influence management decision making.

Exhibit 6.8

CALL PRIORITY CLASSIFICATIONS

(South Bay Regional Public Communications Authority)

Priority #1:	Urgent calls requiring immediate response.
Examples:	Crimes in Progress Accident with Injury Robbery and/or Burglary Alarms Any emergency involving imminent danger to life, limb, or property
Response Time:	Immediate
Priority #2:	Expedited calls requiring response without unnecessary delay.
Examples:	Family Disturbances Non-Injury Accidents Traffic Hazards
Response Time:	15 minutes or less
Priority #3:	Routine calls
Examples:	Late Disturbance Calls Theft and Burglary Reports Malicious Mischief Reports Insurance Reports Patrol Checks
Response Time:	30 minutes or less
Priority E:	This is a priority level that is assigned by the Complaint Operator and will be used in an emergency of a nature in excess of Priority 1.
Example:	999 (Officer Down - needs help).

6.3.1 Records System Operations

Most departments have had years of experience in operating a communications service, and have already designed a communications records system which operates smoothly and supports their basic information requirements. Two key decisions had to be made, either explicitly or implicitly, when establishing those systems: (1) What information should be stored? and (2) How should the information be stored?

The decision process used to establish a shared communications record system is essentially similar. However, the decisions about the types of information and records storage needed must take into account both the diverse needs of the participating departments and the new demands and constraints stemming from the increased workload and complexity of the shared system.

Information Requirements

For the most part, the records required for a shared communications system are similar to those maintained by individual departments. These should include as many of the following items as possible or appropriate:

Radio	Telephone
number of radio messages	number of call
time of message	time of call
duration of message	duration of call
dispatcher handling message	operator handling call
frequency used	telephone line used
mobile unit(s) involved	name of caller
type of message:	phone number and address of caller
status change	address of incident
dispatch: time of dispatch	description of incident
time of arrival at scene	
time of disposition of incident	
type of disposition of incident	

The involvement of two or more agencies in the communications system may require that additional items of information be recorded as well. For example, systems which rely on usage formulas for billing purposes may want to include information on the jurisdiction in which an incident occurs by recording the name of the town as well as the street address. In addition, a shared system should record the department of each patrol unit responding to

an incident. When planning the shared system, member departments should be sensitive to the increased data needs which may be brought about by the new arrangement and should incorporate these information items in the forms used by operators and dispatchers. It is important to standardize the information to be recorded in a shared system so as to minimize confusion and ensure completeness and accuracy. In the agency supplier arrangement, typically the supplier agency will collect the same information for the consumer agencies as required for its own needs, with additional items to indicate the jurisdiction in which incidents occur and the departments to which responding units belong. In the joint provision arrangement, the data to be collected should be agreed upon when the system is first established.

A less desirable option is the collection of different data for different departments. Such an approach is feasible for both the agency supplier model and the joint provision model. This option may cause confusion and inhibit cooperation, but may be necessary if member departments cannot agree.

Storage and Access

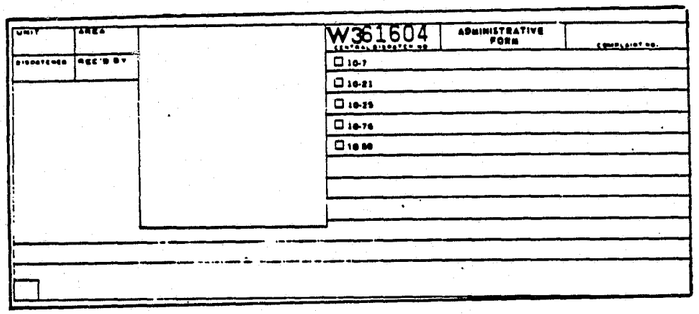
Accessibility is a particularly important consideration for records in a shared communications system because the people who use records are located in several different places, and also because each member department will need those records which apply to its own operations, covering the calls from its jurisdiction and the responses of its own officers. While police departments have traditionally relied on manual communications records systems, many departments and shared communications services have turned to computerized records. A manual system must be designed with some care to ensure that information will be available as it is needed, without excessive filing. For example, the Pasco, Washington Police Department uses a self-carboned form as a dispatch and incident report, filed according to chronology, incident type, and incident location. In a shared communications system, records such as these could be picked up each day and filed at the member departments, with the dispatch center maintaining only summary information.

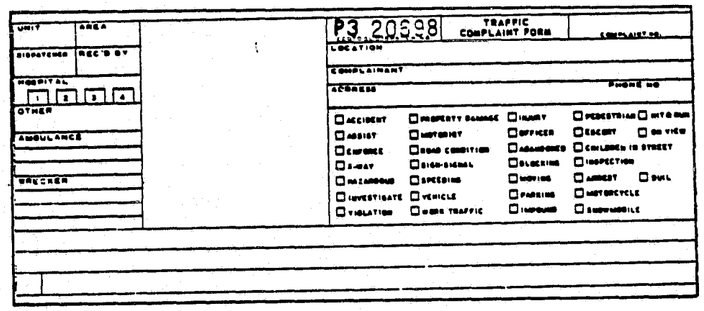
The Muskegon Central Police Dispatch provides an example of a basic manual monitoring system which has proved quite satisfactory for monitoring some 200 sworn personnel. The status cards used to record and retrieve the information are depicted in Exhibit 6.9. If a field unit calls in for

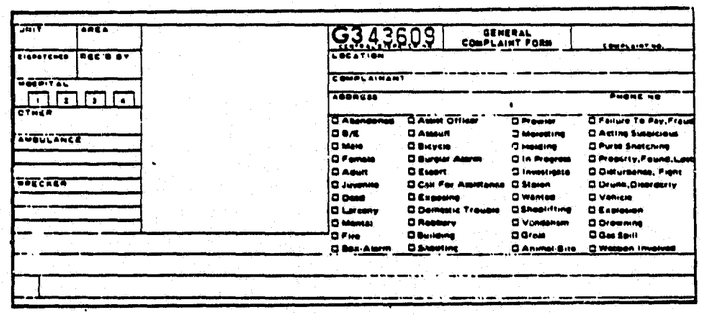
Exhibit 6.9

SAMPLE STATUS CARDS

(Muskegon Central Police Dispatch)







strictly administrative reasons (e.g., to report that it is leaving its patrol area), the dispatcher completes the administrative status card. When a 911 call for police service is received, the dispatcher completes either a traffic status card or general complaint card depending on the type of service requested, recording on it:

- type of assistance needed
- location where assistance is needed
- name of caller
- address of caller
- telephone number of caller

The dispatcher time stamps the traffic and complaint cards four times: (1) upon receipt of the complaint, (2) upon transmission of the message to the field unit, (3) when the unit reaches the scene, and (4) when the unit completes the assignment.

Over time, the use of manual recordkeeping can result in the accumulation of vast quantities of records, usually consuming many drawer files and a significant portion of the system's available storage space. There are many ways to reduce this burden while ensuring ready access to pertinent records, including:

- Use of Open-Shelf Filing. Drawer files are expensive and must be limited in height to approximately four feet to provide accessibility, which wastes a considerable amount of floor space. Shared communications systems which must maintain a large volume of records are now using open-shelf filing. In comparison with conventional drawer filing, open-drawer filing is 50% faster in both filing and retrieval, requires 62% less floor space, and is 70% less expensive.*
- Microfilming. Microfilming increases records storage capabilities and provides a means to maintain a workable volume of active records. Since the purchase of a microfilming camera is beyond the fiscal capacities of most shared communications systems, this service can be obtained by contracting with a private firm possessing the necessary equipment. However, since microfilm records will be periodically searched for information, the system should consider the purchase of a microfilm printer-reader. This will not only provide a visual display of microfilm documents but also can automatically print out a copy of the document.

*International Association of Chiefs of Police, Guidelines for the Establishment of a Joint Police Records and Communications System for the Sumter Police Department and the Sumter County Sheriff's Department South Carolina (Gaithersburg, Maryland, 1971), p. 72.

- Periodic Purging. Another way to avoid expensive record storage problems is to establish uniform criteria for record retention and purging. Provided that management information, crime analysis, and statistics have been aggregated from the hardcopy record on a routine basis, the following purge schedule has been suggested for all local law enforcement agencies: felony crime reports (7 years), misdemeanor reports (2 years), incident reports (2 years), arrest/booking reports (30 years), field interview cards (6 months), and traffic accident reports (3 years).*

While a manual recordkeeping system is practical for a relatively small shared communications system, a computerized system will provide easier access, quicker procedures, and more information for less time and storage space. A computerized monitoring system includes steps very similar to those in a manual monitoring system. Instead of recording information on paper and using a timeclock to record the times of events, operators and dispatchers enter information into a computer using a keyboard like a typewriter keyboard. A screen like a television screen displays a form with blanks for entering information, serving the same function as a paper form by reminding dispatchers and operators what information is required. The computer can be programmed to record the times of data entries.

A computerized records system can retrieve information according to various tags--date, type of incident, agency responding, incident location, etc. For example, Exhibit 6.10 shows sections of the "Monthly Transaction Data Report" of the South Bay Regional Public Communications Authority. In addition to regular printed reports, a computerized records system can provide information upon request. Member departments may gain direct access to records by maintaining their own terminals.

Recordkeeping is a sufficiently complex task without the additional difficulty of inconsistent practices among member departments in a shared system. For example, a typical joint provision arrangement might assign one frequency and one dispatcher to each department. If an officer on patrol is

*Public Systems Incorporated and the Institute for Police Studies, Final Report on the Feasibility of a Coordinated Records and Communications System for Region XI, pp. 5-8.

Exhibit 6.10

MONTHLY TRANSACTION DATA REPORT

(South Bay Regional Public Communications Authority)

	HERMOSA BEACH POLICE DEPARTMENT								
DAY OF MONTH	1	2	3	4	5	6	7	8	9
COMPLAINT									
COMPLAINTS ENTERED	26.	30.	37.	28.	43.	29.	37.	20.	26.
COMPLAINTS ADVISED	0.	2.	0.	0.	1.	3.	0.	0.	1.
COMPLAINTS CANCELLED	1.	5.	9.	4.	6.	7.	3.	0.	3.
DISPATCHER									
COMPLAINTS ENTERED	8.	3.	8.	6.	10.	8.	7.	10.	5.
COMPLAINTS ADVISED	1.	0.	0.	0.	1.	0.	2.	0.	0.
COMPLAINTS CANCELLED	1.	1.	2.	0.	3.	1.	1.	1.	2.
COMPLAINTS DISPATCHED	17.	19.	21.	26.	27.	33.	19.	18.	18.
OFFICER INITIATED	1.	1.	1.	0.	1.	0.	0.	0.	0.
TRAFFIC STOPS	5.	5.	5.	9.	11.	14.	10.	6.	11.
SUBJECT STOPS	1.	3.	2.	3.	2.	15.	2.	0.	3.
STATUS CHANGES	238.	239.	270.	297.	448.	380.	267.	279.	260.
DB INQUIRIES	4.	20.	7.	53.	46.	41.	28.	17.	34.
MOBILE TERMINAL									
COMPLAINTS DISPATCHED	32.	24.	30.	23.	49.	38.	45.	26.	33.
OFFICER INITIATED	9.	7.	9.	7.	18.	12.	11.	8.	7.
TRAFFIC STOPS	0.	0.	0.	0.	1.	0.	0.	0.	0.
SUBJECT STOPS	1.	0.	0.	0.	0.	0.	0.	1.	3.
STATUS CHANGES	50.	39.	40.	36.	67.	69.	39.	52.	66.
DB INQUIRIES	51.	26.	6.	44.	35.	49.	28.	114.	63.

	MANHATTAN BEACH POLICE DEPARTMENT								
DAY OF MONTH	1	2	3	4	5	6	7	8	
COMPLAINT									
COMPLAINTS ENTERED	51.	47.	52.	52.	83.	88.	46.	54.	51
COMPLAINTS ADVISED	0.	1.	0.	0.	1.	5.	2.	0.	1
COMPLAINTS CANCELLED	4.	7.	8.	7.	13.	19.	12.	2.	9
DISPATCHER									
COMPLAINTS ENTERED	9.	5.	8.	7.	11.	7.	9.	8.	8.
COMPLAINTS ADVISED	0.	0.	0.	2.	2.	3.	0.	1.	0.
COMPLAINTS CANCELLED	2.	0.	2.	1.	5.	0.	4.	3.	2.
COMPLAINTS DISPATCHED	37.	33.	31.	15.	48.	28.	10.	22.	41.
OFFICER INITIATED	0.	0.	1.	2.	0.	0.	0.	0.	0.
TRAFFIC STOPS	29.	25.	17.	30.	45.	26.	22.	19.	49.
SUBJECT STOPS	0.	1.	2.	2.	1.	1.	1.	3.	3.
STATUS CHANGES	500.	474.	441.	431.	599.	545.	425.	398.	516.
DB INQUIRIES	312.	71.	65.	75.	121.	69.	39.	71.	72.
MOBILE TERMINAL									
COMPLAINTS DISPATCHED	65.	50.	53.	90.	99.	96.	67.	76.	74.
OFFICER INITIATED	14.	11.	13.	13.	22.	18.	13.	15.	14.
TRAFFIC STOPS	5.	1.	1.	7.	3.	1.	1.	4.	1.
SUBJECT STOPS	0.	0.	0.	0.	0.	0.	0.	0.	0.
STATUS CHANGES	107.	102.	104.	195.	242.	188.	147.	169.	152.
DB INQUIRIES	168.	228.	73.	166.	114.	14.	526.	176.	154.

unable to contact his own dispatcher because his department's frequency is busy, he should be able to contact another department's dispatcher on a different frequency, and should be able to depend on that dispatcher to keep records of the communication which will meet the requirements of his department. Uniform data requirements and forms will greatly facilitate such mutual assistance by simplifying the dispatcher's job.

6.3.2 Accountability

Thorough records are indispensable in case of complaints about the handling of an incident. If complaints are unfounded, records will show that they are. If complaints are justified, records will show the errors which were made. The following examples illustrate the importance of records for accountability.

- An officer is unable to make radio contact with his dispatcher from the shopping center where he is holding a shoplifting suspect. He calls the dispatch center by phone, identifies himself and requests his dispatcher. The operator puts him on hold. He hangs up after a few minutes, calls back and again identifies himself, and requests his dispatcher. The complaint operator responds 'Say please', puts him on hold briefly and then he is connected to his dispatcher.

Tape recordings and time-coded computer log entries enabled supervisors to review the incident directly rather than relying on the memories of the people involved. The log entries revealed that extremely heavy phone traffic justified placing the officer on hold. The tape recording of the conversations between the officer and the operators enabled the supervisor to make a judgment about the nature of the operator's remark (the supervisor characterized it as "an innocent attempt at humor").

- A patrol officer dispatched to a burglary in progress at 1880 Armour Lane, finds that there was no such address, informs the dispatcher, and is sent to 1800 Armour Lane, the correct address.

When this officer submitted a complaint about this incident, a tape recording of the call for service revealed that the error was committed by the complaint operator. The operator had initially verified the correct address with the caller, but inadvertently entered the address incorrectly into the computer when transferring information to the dispatcher. The operator -- who was new to the job -- was counselled as to the seriousness of the error.

As these examples suggest, time-coded records (whether manual or computerized) and tape recordings of telephone and radio communications are crucial for maintaining accountability of the communications staff to the patrol forces. Records are also essential for maintaining accountability to the public. If, for example, a citizen complains that the police took a long time to answer a call for service, time-coded records showing the time of the call and the time of police arrival at the scene can show whether or not the complaint is well-founded.

6.3.3 Management DecisionMaking

The information needed for management and evaluation is essentially the same information which is collected in day-to-day operations. Once this information is compiled, it can be used to inform decisions about staffing patterns, equipment purchases, or procedural changes, and to justify these decisions in budget requests. For example, recording the time of each call received will reveal the busy and slow times each day so that complaint board operators can be assigned accordingly. Chapter 7 will discuss the uses of records for evaluation. The following example illustrates the utility of records for a management problem specific to a shared communications system:

- A large police department begins to provide dispatching services for a smaller neighboring police department. It is difficult to agree on a price for these services because the smaller department has no accurate records to reveal its workload. After a month of providing services, the larger agency is able to use its records of calls received to determine that the smaller agency's workload averages 10% of the larger agency's workload, and an agreement is reached on a price for the services.

Similarly, in a joint provision arrangement, member departments may be charged according to their use of the shared center.

* * *

Chapter 6 has examined the key elements in operating a service sharing arrangement: choosing facilities and equipment, providing services, and keeping records. Careful implementation of recommended procedures in these areas should result in a shared communications system that is both effective and efficient. It should deliver high quality service at reasonable cost. The issue of whether the system actually does what it is supposed to do will be addressed in Chapter 7: Evaluating a Service Sharing Arrangement.

Chapter 7
EVALUATING A SERVICE SHARING ARRANGEMENT

Evaluation, research, measurement--these are all words that confuse some managers, and scare others. They conjure up images of white-coated scientists in sterile labs, statisticians attempting to solve complex mathematical equations, and auditors with eyeshades examining every expenditure for evidence of fraud and abuse. Demands for high levels of training, accuracy, and care in reporting results also tend to evoke fear and discourage managers from attempting to evaluate performance.

To be sure, some evaluations are difficult. Whenever a shared communications system attempts to prove that its services have caused a particular outcome or that its effects on police response time and other performance indicators are generalizable to other systems, the evaluation must be rigorously designed and carefully controlled. Techniques such as the use of independent and dependent variables, control groups, and random selection must be considered by evaluators in this situation. These evaluations require special skills, take time, and can be expensive.

However, evaluations of this magnitude are not always needed by a shared communications system. Routinely collected operating data can be manually processed to satisfy basic monitoring and evaluation requirements. This point deserves emphasis--the data needed to monitor and evaluate are the same data needed to operate the system, for example:

- number of telephone calls received;
- number of police, fire, and emergency medical units dispatched;
- average response time;
- number and types of incidents handled; and
- levels and objects of expenditure.

Unfortunately, in many shared communications systems, these data are collected, used for operations management, and then set aside. No attempt is made to analyze how much and what types of service are being provided to whom, and at what cost. A valuable opportunity to improve the system's effectiveness and efficiency is thereby lost.

The purpose of this chapter is to explore why shared communications systems should be evaluated and how it is done. Separate sections describe the major steps in any evaluation, and then apply those steps to evaluate the specific aspects of a service sharing arrangement enumerated in Exhibit 7.1: impact, process, and costs.

7.1 Why Evaluate?

Evaluation tells you and others if a shared communications system is doing what it was intended to do in the way it was intended to do it. Just claiming something works the way it was intended is not good enough for most people, particularly those who have to make policy and budget decisions for member jurisdictions. The system's worth must be demonstrated. No good intentions or skillful use of words can be submitted for accurate analysis or carefully drawn inferences.

The internal uses that a shared communications system can make of evaluation include:

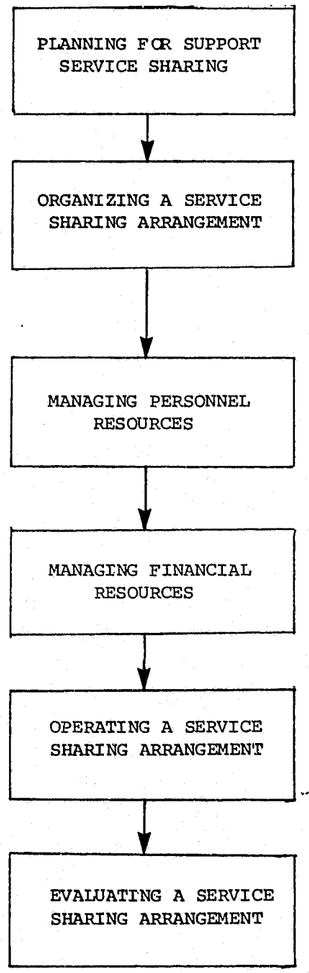
- to determine system impact;
- to improve practices and procedures;
- to allocate human and financial resources among different system activities and components;
- to determine if the system is meeting its objectives and the needs of its members; and
- to monitor program quality.

External organizations can also utilize evaluations of the shared communications system. Member jurisdictions, potential members, funding agencies, and citizen groups need data about the system's efficiency and effectiveness in order to decide whether:

- to continue or discontinue the system or their own membership;
- to establish similar systems elsewhere;
- to allocate scarce budget dollars to other public safety or general government activities; and
- to accept, reject, or modify an approach or assumption regarding communications technology or intergovernmental cooperation.

Exhibit 7.1

EVALUATING A SERVICE SHARING ARRANGEMENT



Chapter 2

- Developing Interest and Support
- Determining Type of Sharing Arrangement
- Deciding on Nature and Level of Service
- Establishing a Written Agreement
- Ratifying the Agreement

Chapter 3

- Building an Organization Structure
- Formulating a Decision Making Process

Chapter 4

- Employment Planning
- Recruiting
- Selecting
- Training and Development
- Compensation
- Performance Appraisal

Chapter 5

- Budgeting
- Financing
- Auditing

Chapter 6

- Choosing Facilities and Equipment
- Providing Services
- Keeping Records

Chapter 7

- Measuring System Impact
- Measuring System Process
- Measuring System Costs

7.2 Logic of Evaluation

There is a certain logic about evaluation, a series of steps that can be followed to evaluate a shared communications system or, for that matter, any other type of organization or sharing arrangement. The contexts and decisions may differ but the steps are virtually the same. These steps are depicted in Exhibit 7.2:

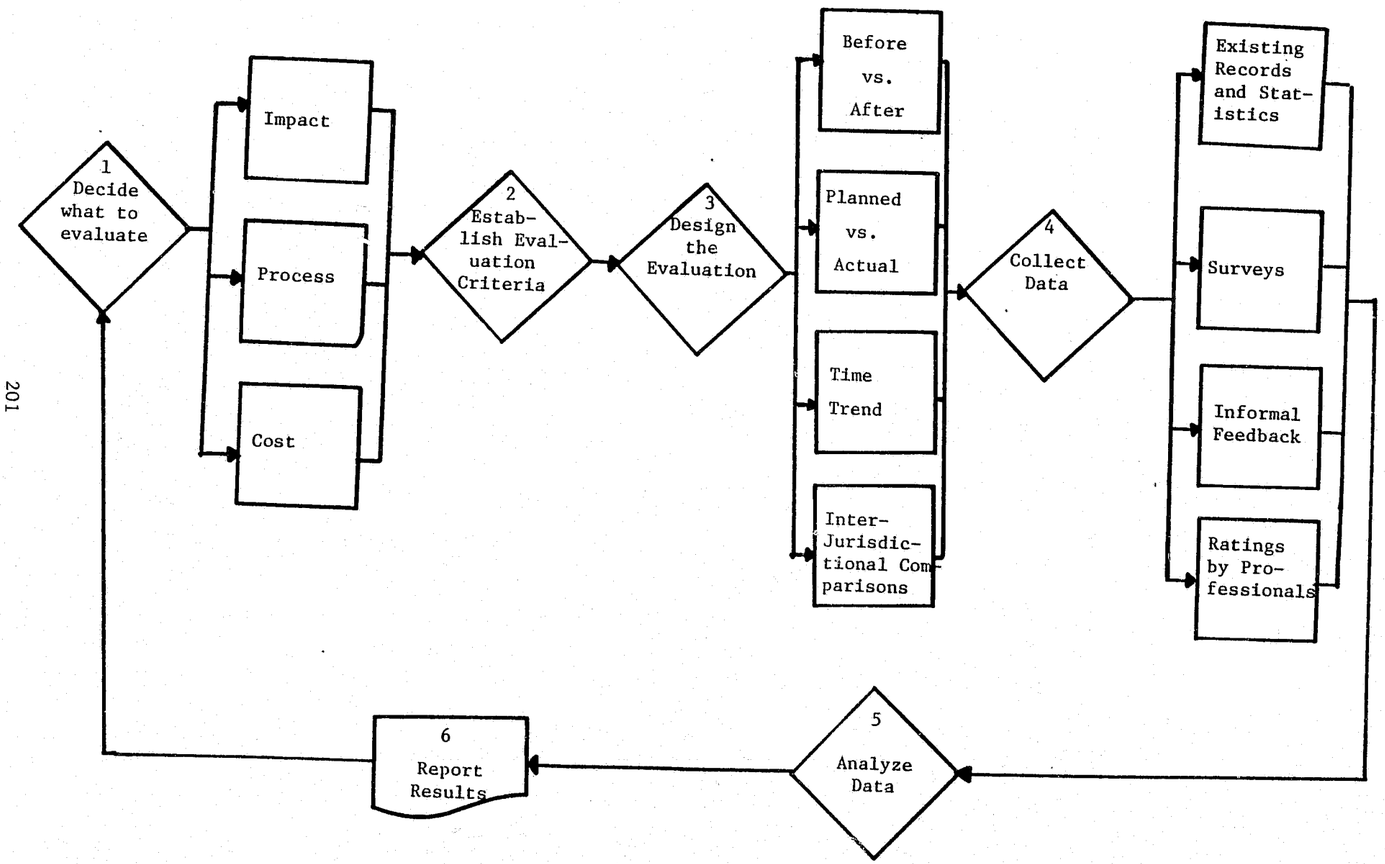
1. Decide what to evaluate
2. Establish evaluation criteria
3. Design the evaluation
4. Collect data
5. Analyze data
6. Report results

1. Decide what to evaluate. It is not always clear what should be evaluated. Some argue that evaluation should focus on the system's results, i.e., on the measurable impact it has on response time, citizen satisfaction, and other outcome measures. Advocates of this approach view a shared communications system as a "black box" in which what the system accomplishes is far more important than how the system accomplishes it. Others contend that evaluation must also examine the process by which the system produces its results; otherwise it is impossible to isolate which aspects of the service sharing arrangement helped or hindered the system in accomplishing its intended results. A process evaluation studies how the system is organized and how it delivers its service. Finally, in addition to a shared communication system's impacts and process, an evaluation can measure its cost. In an era of fiscal austerity, the cost of a shared communications system is a critical issue, especially since saving money is a principal reason for sharing services rather than operating them independently.

2. Establish evaluation criteria. Evaluation criteria are used to measure progress toward the system's objectives. They are the specific performance targets that must be met before the objective can be accomplished. The evaluator will frequently find that there is more than one evaluation criterion for measuring progress toward each impact, process, or cost objective, e.g.,:

Exhibit 7.2

LOGIC OF EVALUATION



- Impact Objective: By July 1, 1984, communications system response time will be reduced by 10%.

  Evaluation Criteria: Seconds of telephone ring duration

  Seconds of telephone talk time

  Seconds of radio system delay time

- Process Objective: By July 1, 1984, radio system security and reliability will be improved by 10%.

  Evaluation Criteria: Number of radio sites with emergency power facilities

  Number of sites alarmed for intrusion, fire, and equipment failures

  Number of individual police and fire headquarters equipped for radio operations in event of regional radio failure

- Cost Objective: By July 1, 1984, the cost per call for service handled will be reduced by 10%.

  Evaluation Criteria: Number of calls for service handled

  Total personnel and non-personnel costs

Evaluation criteria should be identified without initial concern about whether or how they can be measured. There are often ways to at least partially measure the more qualitative or subjective criteria by using ratings, rankings, and other procedures. For example, citizen satisfaction may appear impossible or difficult to measure but a simple telephone survey can usually supply the needed data. In addition, there is no right or wrong value for criteria. Fire deaths per 1,000 population can be compared with figures from other jurisdictions but no accepted standard exists. Evaluation criteria are intended only as quantifiable indicators upon which to base judgments; the criteria themselves do not provide any answers. Finally, the evaluator must recognize that while there are many criteria that can be established for a given objective, he or she must decide which criteria are most important and measurable. The remaining steps in the evaluation process can then focus on measuring just those criteria, thereby conserving time and money and directing the evaluation effort. For, as Mark Twain once contended, "Collecting data is like collecting garbage. You must know what you are going to do with the stuff before you collect it."

3. Design the evaluation. All evaluations are essentially some form of comparison. Whether comparing two communications systems or comparing the

actual accomplishments of a system with its performance objectives, comparison is a key to evaluation. A second key is the capacity to attribute apparent system effects, i.e., to identify those changes in the value of an evaluation criterion that can be reasonably attributed to the system's services. For example, a reduction in average response time to calls for service may not be attributable to anything the system did but rather to the fact that member jurisdictions are using faster vehicles on patrol and providing better field training to their officers. In all cases, therefore, the evaluator needs to search for external explanations for measured changes before crediting or blaming the sharing arrangement.

An evaluation design provides the framework for making comparisons and attributions. Many designs exist but relatively few of them fit the needs of state and local governments.* Four designs applicable to the evaluation of the processes, impacts, or costs of a shared communications system are: (a) before vs. after, (b) planned vs. actual, (c) time trend, and (d) inter-jurisdictional comparisons.

Before vs. After. This design consists of measuring one or more evaluation criteria at two points in time: immediately before the shared communications system was implemented and at some appropriate time after implementation. For example, the evaluation could examine the salary costs for dispatchers incurred by member jurisdictions before they joined the system with these same costs once the system became operational. This design is also pertinent to measuring evaluation criteria before and after a major change in an existing system such as the measurement of average response time before and after the introduction of computer-assisted dispatch. This design is the simplest, one of the least expensive, and among the most widely used of the four evaluation designs. Regrettably, it provides little evidence that the system itself made a difference rather than some extraneous event or circumstance, e.g., institution of other government programs with coincidental

*An excellent source of information about the wide range of available evaluation designs is: D.T. Campbell and J.C. Stanley, Experimental and Quasi-experimental Designs for Research (Chicago: Rand McNally, 1966). See also: H.P. Hatry, et al., Practical Program Evaluation for State and Local Government Officials (Washington, D.C.: The Urban Institute, 1973), pp. 39-70.

objectives, abnormal weather conditions or crime patterns, or actions taken by member departments in terms of personnel or equipment apart from the sharing arrangement. The use of this design requires an explicit and thorough search for these alternative explanations for measured changes before attributing them to the shared communications system.

Planned vs. Actual. This design compares the actual performance of the system for a given time period with its planned performance. In order to make use of this design, the evaluators must be able to identify realistic objectives for the system and then assess progress towards them by means of credible evaluation criteria. The main advantage of this design is that comparing planned and actual performance is a typical activity of sharing arrangements (though generally based on workload and population served rather than on service quality) and thus this design would not entail additional costs or staff training to implement. This design also supplies evidence of program efficiency and effectiveness and can help detect policies and procedures that need improvement. For example, if actual expenditures are consistently higher than planned, this finding may suggest that financial controls should be strengthened, accounting procedures changed, or personnel trained.

Time Trend. This design compares actual data on the evaluation criterion with projections for the criterion based on data from previous years. Changes caused by the system are identified as the differences between present-day conditions as they actually are and as they were estimated to be by the projections if the shared communications system had not been established or improved. For example, the average response time could be tabulated for the four years prior to the institution of the shared system and then projected two years into the future. The actual response times of the system during these same two years could then be compared to the projected response times in order to determine if the sharing arrangement made a difference. This design differs from the planned vs. actual design in that it does not require the establishment of performance targets, but relies

entirely on actual performance measures. In using this design, the evaluator should collect data for at least four previous years in order to establish a statistically valid trend, and also make sure that there were no significant changes in the way the data were gathered or recorded during the past performance intervals. This design is more expensive than the previous designs because it requires technical expertise to undertake the statistical projections and the collection of data over several years.

Inter-Jurisdictional Comparisons. This design compares data from jurisdictions participating in the shared communications system with data from other jurisdictions where the system is not operating. Comparisons could be made in terms of dispatching costs, average response times, and other evaluation criteria. If the independent jurisdictions demonstrate similar gains on significant criteria, it is possible that factors other than the sharing arrangement produced the difference. One major problem with this design is identifying suitable comparison jurisdictions since they should have the same demographic, geographical, and economic characteristics as the jurisdictions in the shared communications system. Another problem is the special effort needed to collect information on the evaluation criteria from the comparison jurisdictions since there may be restrictions or extra costs associated with such an inter-jurisdictional information exchange.

Probably the most extensive use should be made of the planned vs. actual design based on setting targets for individual evaluation criteria. This should be done because such comparisons should be an integral part of system management and not merely done for evaluation purposes. In addition, the before vs. after, time trend, and inter-jurisdictional comparison designs should be used in combination. That is, the evaluation would examine before vs. after values for selected criteria, undertake projections for criteria where prior year data were available, and search for similar jurisdictions with which to compare member jurisdictions. The findings of all of these would be considered jointly in drawing conclusions about system efficiency or effectiveness. Finally, minimal use should be made of the before vs. after design alone. Its inability to distinguish between changes in the value of evaluation criteria produced by the system and changes produced by extraneous factors is a powerful argument against using this design alone, except as a last resort.

4. Collect the data. Data collection consumes the greatest amount of time and effort. The data to be collected is determined by reviewing the two previous steps in the logic of evaluation: the system's evaluation criteria and performance objectives suggest what data can best indicate the efficiency and effectiveness of the system while the evaluation design mandates the time periods and for what specific groups data are required. In collecting the data, every effort should be made to ensure that the data are reasonably accurate and complete and, since evaluation relies on comparisons collected at different times and possibly for different jurisdictions, data should be comparable. For discussion purposes, five sources of data have been identified: (a) existing records and statistics, (b) surveys, (c) observation, (d) informal feedback, and (e) ratings by professionals.

Existing Records and Statistics. As mentioned previously, the most productive source of data for evaluating a shared communications system is existing records and statistics. For example, an evaluation involving a shared communications system requires records on calls for service, number and types of incidents handled, budgeted and actual expenditures, and possibly police department records on the number of arrests and prosecutor records on subsequent disposition of those cases. These records and statistics can be drawn from a single shared communications system or from comparable systems or independent jurisdictions. People who handle the records on a day-to-day basis are most familiar with them and can probably locate and extract the data quickly provided that they receive both clear, concise directions and proper authorization. (This last consideration underscores the need for top-level support of the evaluation by system management and participating jurisdictions.) It will still be important for the evaluator to spot check the accuracy of the data in order to detect clerical errors (transposed digits, recording the wrong figure, etc.) and to determine whether the data are guesses or estimates rather than "hard" data provided by the system's management information system.

Surveys. Another data source is the perceptions of member jurisdictions, system staff, and the citizenry. Interview and questionnaire surveys can probe how they feel about the system and the quality of service they have received from it. A survey may involve mailing questionnaires to respondents, leaving questionnaires at respondents' homes or offices and retrieving

them at a later date, interviewing respondents in person, or interviewing them over the phone. Surveys provide feedback on the respondents' perceptions, desires, needs, preferences, and experiences unavailable from other sources. An innovative survey approach is to send postcards to a random sample of citizens who have called the shared communications system for police or fire assistance asking for their reactions to the way in which their calls were handled and the speed with which units reached them. With proper sampling, survey data can be aggregated for all respondents or for specific population segments, e.g. comparing the feelings of line police officers about the system with those of average citizens. On the other hand, surveys consume substantial amounts of time and money, require special technical resources to design and administer, and are limited by each respondent's memory and willingness to cooperate.

Observation. This method requires that one or more observers devote their attention to the behavior of an individual or group within a natural setting and for a prescribed time period. In shared communications systems, it is used most often to appraise the telephone and dispatch skills of communications operators. The observer may be the system's manager, a center or shift supervisor, or employee hired specifically to evaluate on-the-job performance. An instrument used to record this kind of information would likely be formatted as a questionnaire or tally sheet listing the proper operator procedures and behaviors and allowing space for the observer to record impressions of how well each operator performed. Provided that the observer is given detailed instructions on who or what to observe as well as when and how long to observe, this method can be a highly credible source of data. However, it does require careful observer training, investment of substantial amounts of time in the observing process (the observer may have to sit through coffee breaks as well as job performance), and allowance for the likelihood that observation will prompt those being observed to behave in atypical ways in order to impress the observer.

Informal Feedback. Often unfairly labelled as the "grapevine" or "rumor mill," informal feedback is information about system performance that is transmitted irregularly and received informally. Its main use is to supplement information received from other sources since informal feedback is too unreliable to be used alone. One source of informal feedback is citizen

complaints, often in the form of unsolicited letters. While these letters are often used as "horror stories" at meetings of system managers or boards of directors, they have an inconsistent influence on system procedures or policies because only dissatisfied clients use this avenue of communication and, in any event, few jurisdictions handle them systematically. However, in Kansas City, Missouri, complaint data are summarized monthly for the operating departments and city manager in order to provide a rough barometer of public opinion toward specific services. Another source of informal feedback is regular attendance by system personnel at meetings of local service clubs and professional associations that can supply a forum for surfacing perceived problems. While such input can be as unrepresentative of true community feelings as complaint letters, the observer at these meetings can discern useful information through careful questioning and listening.

Ratings by Professionals. In some situations, ratings by professionals may be appropriate for evaluating a shared communications system. Such "expert opinion" relies on the education and experience of a government analyst or private consultant to consider a wide range of quantitative and qualitative data in order to arrive at an overall judgment about the system's performance or the value of a specific evaluation criterion. Ratings by professionals may be especially useful on the technical side of the enterprise: observing intake and dispatch procedures, appraising the equipment, or auditing the system's financial or personnel systems. It is important that the professional have solid credentials, experience with other shared communications systems, access to system managers and employees, and a detailed contract that specifies tasks, schedule, and rate of compensation.

In deciding which data source to use, shared communications systems should keep in mind the principle of "triangulation of data." This means that more than one data source should be used to measure each evaluation criterion whenever possible. The results from one source can be used to doublecheck the results from other sources, thus adding more confidence and credibility to the overall evaluation results.

For most systems, the bulk of their evaluation data will be derived from existing records and statistics and from informal feedback. Both sources are readily available for evaluations since they exist as part of the information that system managers use in everyday decision making. Because of

their relatively high cost, surveys and ratings by professionals should be used sparingly. Their most appropriate application is in situations where citizen feedback is needed or the credibility that independent judgment would bring to the evaluation is essential.

5. Analyze data. The third step in the logic of evaluation, select an evaluation design, demonstrated that a key to evaluation is comparison. The emphasis in analyzing the data will be on organizing them so that comparisons can be made.

The comparison to be made in the planned vs. actual design is between the planned values and the actual measured values for the evaluation criterion. A common and effective way to make this comparison is to express the relationships as a percentage. Percentages for all of the criteria for an objective can be displayed in either a simple table or in a bar chart. As illustrated in Exhibit 7.3, the table would have vertical columns for a brief description of the criteria, the planned value, the actual measured value, and the percentage of accomplishment (planned value divided by the actual value). Also shown in Exhibit 7.3, the bar graph would display only the percentage of accomplishment for each evaluation criterion. Data arrayed in this fashion enable the evaluator to draw rapid, accurate conclusions about system performance and to pinpoint areas of immediate concern.

In the time trend design, the comparison is between the trend shown for the actual values for the evaluation criterion prior to system initiation or improvement and the actual and projected values for the criterion after implementation. The criteria values should be displayed on a graph to simplify analysis. Figure 7.4 suggests that time should be displayed on the horizontal (X) axis and the criteria measurement scale on the vertical (Y) axis. Actual measured values for the criterion should be plotted for several time periods prior to program implementation and at least one time period after implementation. A vertical dashed line or other indicator should be drawn on the graph to mark the time of system initiation or change. The evaluator looks for (1) a significant change in the trend of the graph line for the actual values that coincides with the start of, or change in, the system being evaluated, and/or (2) a significant difference between the projected and actual values. The shared communications system depicted in Exhibit 7.4 incurred significantly higher actual costs per call for service

Exhibit 7.3

PLANNED VS. ACTUAL COMPARISONS

TABLE

Criteria	Planned	Actual	Percent Accomplished
Cost per call for service	$4.80	$5.00	96%
No. of communications operators hired	10	10	100%
Average delay time	15 sec	17.2 sec	87%
Average communications system response time	70 sec	79.1 sec	88%

BAR GRAPH

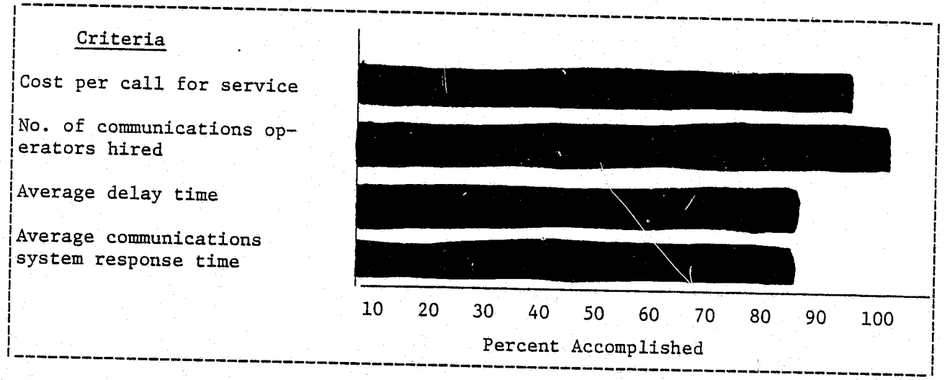
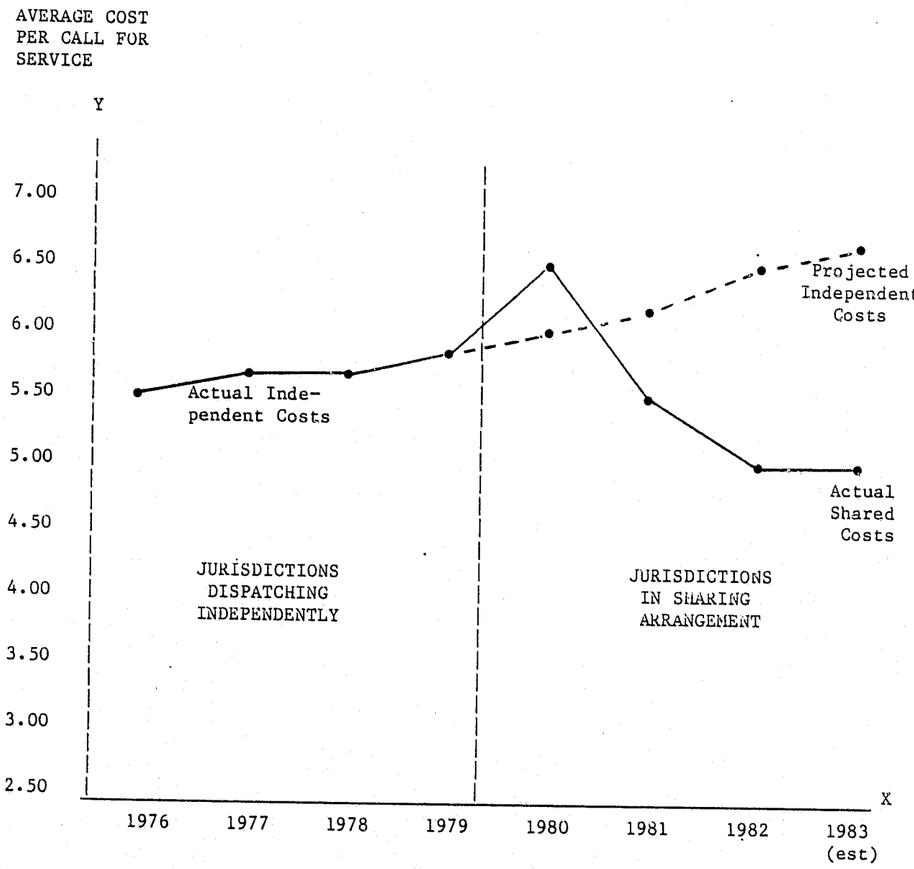


Exhibit 7.4

TIME TREND ANALYSIS OF COST PER CALL FOR SERVICE

(1982 dollars)



immediately after its 1979 establishment (mostly start-up costs for relocation and training) but steadily lower costs in succeeding years, when compared to pre-1979 costs and projected 1979-83 costs for independent dispatching. Costs incurred in each year were transformed into their 1982 dollar equivalents to remove the effects of inflation from the analysis.

The comparison in the before vs. after program design is between the actual value of the evaluation criterion measured immediately before a system is initiated or a major change introduced and the actual value measured at some later time. This is the simplest comparison and can be made by comparing the raw values for the criterion, or by using a bar chart showing two bars, one for before the system and the other for after the system was initiated or changed. The difference between the two values can be considered the program impact, provided that other plausible explanations for the difference can be eliminated. An example of a before vs. after system analysis is presented in Exhibit 7.5, which is drawn from a study of central dispatching conducted by the IIT Research Institute for the villages of Arlington Heights, Elk Grove, and Mount Prospect, Illinois.* It suggests that central dispatching produced significant reductions in radio system delay times and in communication system response times, except during a few shifts.

A graph or table are probably the best methods for analyzing the inter-jurisdictional comparison design. The value of the evaluation criterion in the jurisdictions served by the shared system could be compared with that same value in independent jurisdictions outside the system. The graph in Exhibit 7.6 uses a solid line to show the cost per call for service for jurisdictions in the shared communications system and a dotted line for the cost in similar jurisdictions that are independent. It indicates that all jurisdictions had almost identical costs prior to 1979 when the sharing arrangement began, but that since then the costs of the system have averaged lower than the costs of independent dispatching.

6. Report results. On the basis of the evaluation criteria studied, the relative success or failure of various aspects of the sharing arrangement must be determined. Each objective should be considered in turn, and the

---

*B. Ebstein et al., Final Report: Central Dispatching System Design, Test and Implementation (Chicago: IIT Research Institute, 1973).

Exhibit 7.5

BEFORE VS. AFTER COMPARISONS

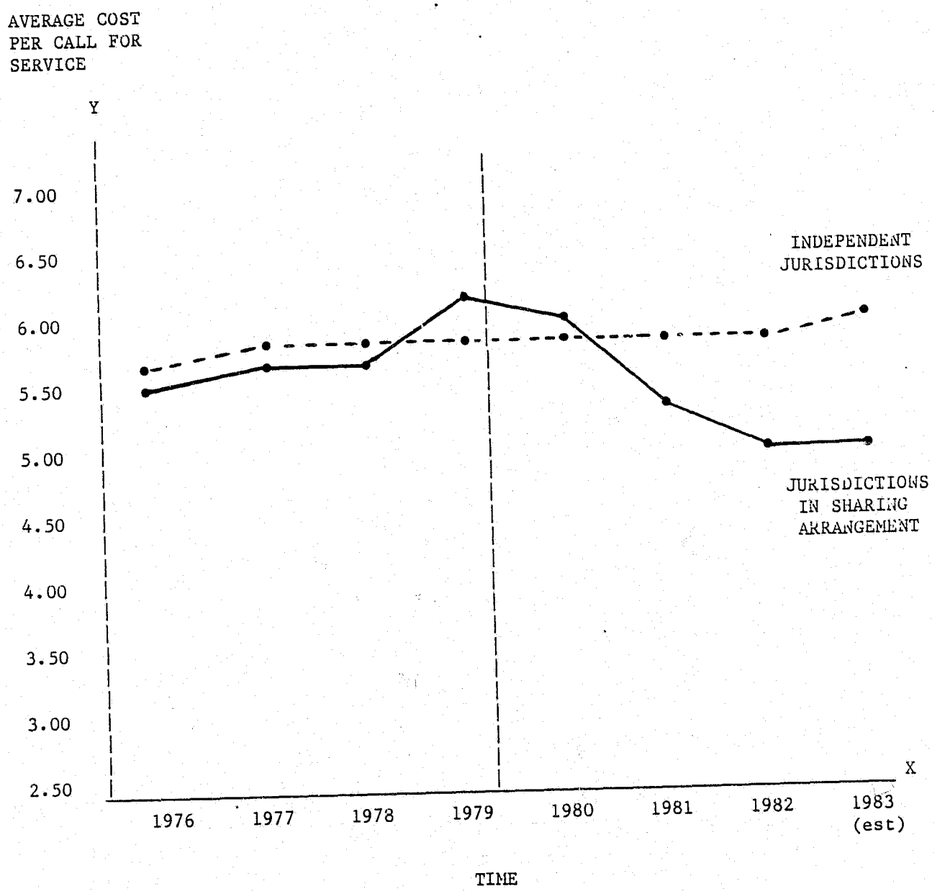
DEPARTMENT	SHIFT	RADIO SYSTEM AVERAGE DELAY TIME		COMMUNICATION SYSTEM RESPONSE TIME	
		Before (sec)	After	Before (sec)	After
A	(1)12-8AM	7.9	5.6	62.8	77.7
	(2) 8-4PM	18.1	7.6	87.4	49.0
	(3)4-12AM	12.3	15.1	65.8	61.2
B	(1)12-8AM	2.8	5.3	45.4	65.6
	(2) 8-4PM	21.0	7.9	94.3	54.9
	(3)4-12AM	27.2	14.5	85.7	67.5
C	(1)12-8AM	3.2	4.5	54.0	70.9
	(2) 8-4PM	3.2	8.6	70.7	51.0
	(3)4-12AM	5.0	15.7	74.5	63.7

NOTE: 1. Radio System Average Delay Time: average time which a message spends waiting to be transmitted, i.e. the average time duration from the instant that a radio user first conceives of the message to the instant he begins transmission of the message on the radio channel.

2. Communication System Response Time: average time from the beginning of the ring of an incoming telephone call until the dispatch radio message is sent.

Exhibit 7.6

INTER-JURISDICTIONAL ANALYSIS OF COST PER CALL
(1982 dollars)



relevant criteria measurements examined. Multiple criteria for a given objective are more reliable than a single criterion in providing indications as to whether the objective has been realized.

Data analysis may suggest conclusions and clearly show relationships but the final decision on relative success or failure of the system is still a matter of judgment. In most cases, the apparent success must be weighed against the costs incurred and what might have been accomplished had the sharing arrangement never existed. Moreover, analysis is not a substitute for decision making. Regardless of the amount of quantitative data, the numbers alone will not make decisions about the system's process, impact, or costs. They must be supplemented by the needs, expectations, and opinions of the persons who manage the system and the member jurisdictions which make it possible.

The report itself should be in writing in order to reduce the possibility that misunderstandings will develop over the content and interpretation of evaluation findings. Errors and poor methodology might not be evident unless results are written. An oral presentation is a recommended supplement to, and not a substitute for, a clearly written, brief evaluation report. The report should address six basic issues:

- What was evaluated?
- Why was the evaluation conducted?
- What was evaluated?
- How was the evaluation conducted?
- What are the results?
- What actions should be taken?

Based on these issues, a sample outline for a report is presented in Exhibit 7.7. The outline lends itself to preparing one consolidated report or several separate smaller reports (or memoranda) for various target audiences. An overriding concern in report preparation is to keep the report as brief as possible in order to enhance the prospects that top decision makers will read and utilize it. Formal or annual reports can be 100 pages or more but most reports around a specific evaluation criterion or issue can and should be considerably shorter.

In summary, Steps 1-6 in the logic of evaluation apply to every aspect of a shared communications system: the impacts it produces for member

Exhibit 7.7

SAMPLE EVALUATION REPORT OUTLINE

I. Executive Summary—of primary interest to elected officials, legislators, chief executive officers, and administrators. Approximately 2–5 pages.
   A. Problem Statement—a brief statement of the problems addressed by the program.
      1. What are the problems that the program is intended to deal with?
      2. What is the impact of these problems on the community? Is the impact economic, social, or both? How severe is the impact? How urgent?
      3. Who is affected by these problems? How many people are affected? Is there a geographic or demographic focus?
   B. Program Description (for evaluation, or the analysis of an ongoing program).
      1. What are the program goals, objectives, and evaluation criteria?
      2. How does the present program attempt to alleviate the problems outlined above?
   C. Methodology—brief description of how the study was conducted.
   D. Recommendations and Conclusions.
      1. For evaluation—What are the positive accomplishments and apparent shortcomings of the program? What measures might improve present program operations?
      2. For analysis—Summarize the one to three alternatives that the analyst believes show the greatest promise. List those major action items necessary to implement the various alternatives and estimate the implementation time frame.
II. Management Report—a 10 to 20 page report written for chief executives or assistants, department or division administrators or assistants, and task force or project leaders who are responsible for the program.
   A. Methodology
      1. Program Evaluation
         a. Enumerate program goals, objectives, and evaluation criteria.
         b. Discuss the evaluation design chosen and the rationale for selection.
         c. Enumerate data sources (records reviewed, persons interviewed, etc.).
         d. Present data summaries in tabular or graph form.
      2. Program Analysis
         a. Enumerate program goals, objectives, and criteria.
         b. Describe all of the alternatives considered in the analysis. Include a summary of advantages and disadvantages for each and an indication of the final disposition of each (included as a final recommendation, rejected as infeasible, dropped for lack of information, considered a secondary alternative, etc.).
         c. Describe approaches used to estimate costs, effectiveness, and implementation feasibility.
         d. Present data summaries in tabular or graph form.
   B. Recommendations and Conclusions—Listing of each recommendation and conclusion and discussion of the rationale behind it. If the list is extensive, the analyst should highlight only the more important items.
   C. Implementation—A discussion of considerations concerning the implementation of recommendations and alternatives. The nature of implementation activities, of course, will depend upon management decisions made in response to the study. The possible make-up of an implementation team should be discussed, and the need for a significant role for the analyst during implementation should be stressed. This section will underline the necessity for teamwork and cooperation between program evaluation and analysis personnel, and also contribute to the decision maker's inclination to implement some course of action based on the feeling that the staff is geared up and ready to go.
III. Technical Report—Written for analytical personnel from other agencies or jurisdictions.
   A. Data—Raw data collected and technical notes documenting assumptions used in making calculations.
   B. Data Sources—Documentation on where various data items were obtained.
   C. Methodology (optional)—Documentation of all calculations used in projections, estimations, evaluation criteria measurements.

Source: Public Technology, Program Evaluation and Analysis (Washington, DC: U.S. Department of Housing and Urban Development, 1978), p.47.

jurisdictions, processes it uses to deliver its services, and the costs it incurs. No matter which aspect is evaluated, the analyst must still identify evaluation criteria, choose an evaluation design and data collection strategy, analyze the data, and report the results. In fact, with respect to evaluation design, any of the four designs mentioned can be used, e.g.:

Aspect	Evaluation Criterion	Design
Impact	Average response time to calls for emergency service	Planned vs. Actual or Before vs. After or Time Trend or Inter-Jurisdictional Comparison
Process	Number of dispatchers per 1,000 population	
Cost	Cost per call for service handled	

Differences begin to occur in selecting a data collection strategy since certain strategies such as existing records apply to every aspect whereas observation or ratings by professionals are more applicable to process. The greatest differences, however, are in the criteria used to evaluate each aspect. Impact, process, and cost criteria are unique.

Thus, there is a need to go beyond the overall logic of evaluation and to examine special considerations in measuring the impacts, processes, and costs of a shared communications system. The remainder of Chapter 7 is devoted to just such an examination.

7.3 Special Considerations in Evaluating System Impacts

Impact is the effect that the shared communications system has on the provision of emergency services in member jurisdictions. In planning and organizing the system, its founding members had certain expectations of what the system would do for them. Many of these expectations may have been explicitly incorporated into the agency supplier contract or joint powers agreement. Some may have been implicit when the system was established but have since been identified in the planning process. Now the issue becomes: To what extent have these expectations been realized?

An earlier discussion on evaluation design foreshadowed the major problem in measuring impact: the inability to distinguish between impacts

caused by the shared communications system and impacts due to extraneous events and circumstances. The broader the intended impact, and the further removed it is from the system's operations, the harder it becomes to attribute all or part of it to the sharing agreement. An increasingly greater number of external factors become equally plausible explanations for why the impact occurred.

This problem is demonstrated in examining the types of impacts illustrated in Exhibit 7.8. Service quality is the easiest to measure because it relates most closely to system operations and to factors over which the system has the most control and most responsibility. Values for evaluation criteria in the area of service quality can be estimated from existing records and statistics. Client satisfaction, in comparison to service quality, is not only more difficult to measure but also harder to attribute to the system since there are more competing explanations for perceived impacts. Whether a respondent to a survey feels good or bad about emergency services can result from the politeness of the communications operator or the speed with which the patrol car arrived at the scene, in which case the satisfaction or dissatisfaction can be largely attributed to the system. Alternatively, the satisfaction or dissatisfaction may be due to feelings about personal security, neighborhood conditions, or an isolated incident--none of which can be completely attributed to the sharing arrangement and all of which complicate the analysis of system performance. But by far the most difficult impact indicators to connect with the shared communications system are social indicators such as those illustrated in Exhibit 7.9. Rising or falling crime and fire rates are caused by a multitude of socioeconomic factors, in addition to variations in data collection and reporting. How much, if any, of the variation in a social indicator is due to even the largest sharing arrangement is a perplexing question, even under the most controlled, experimental conditions.

To get around the problem of attribution, some jurisdictions are experimenting with a special type of impact evaluation called "effectiveness status monitoring."* This monitoring differs from the usual concept of program evaluation. While program evaluation attempts to identify what

---

*H.P. Hatry et al., Practical Program Evaluation for State and Local Government Officials, pp. 12-13.

Exhibit 7.8

ATTRIBUTION CAPABILITIES OF VARIOUS IMPACT INDICATORS FOR SHARING ARRANGEMENTS

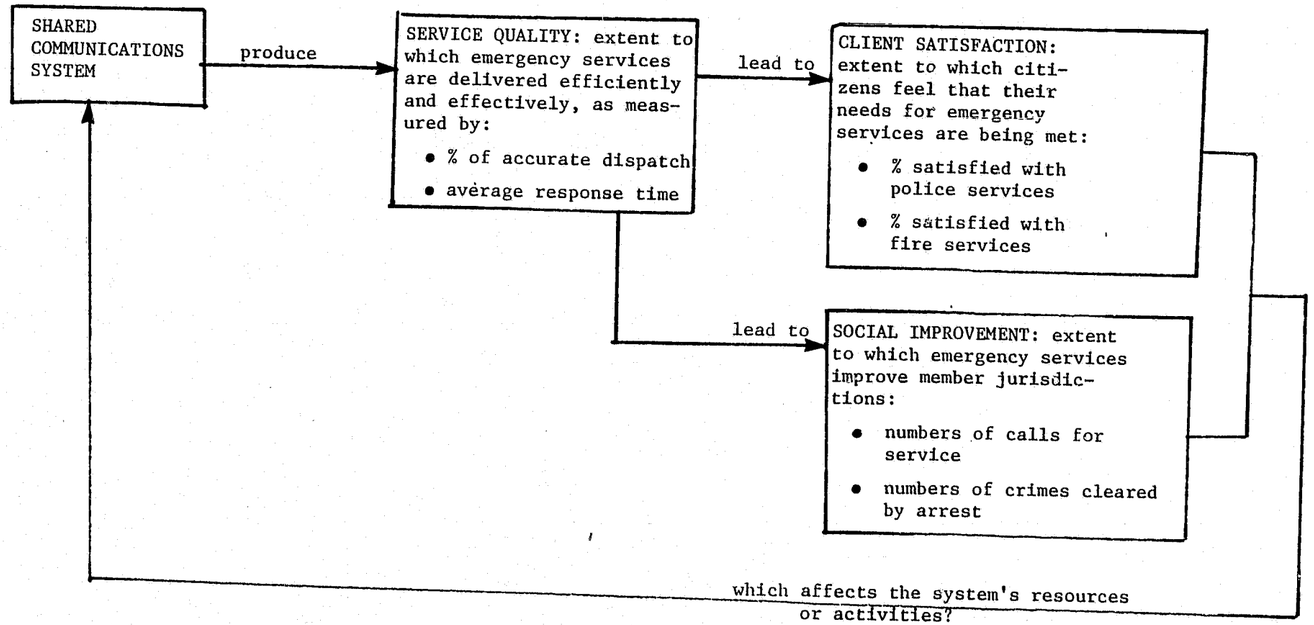


Exhibit 7.9

ILLUSTRATIVE SOCIAL INDICATORS IN LAW ENFORCEMENT AND FIRE PREVENTION

A. LAW ENFORCEMENT

Goal: To reduce the amount and effects of crime and in general to maintain an atmosphere of personal security from criminal behavior. (To some persons the punishment of criminals may be an important objective in itself as well a means to deter further crimes.)

1. Annual number of offenses for each major class of crime (or reduction from the base in the number of crimes).
2. Crime rates, as for example, the number per 1,000 inhabitants per year, for each major class of crime.
3. Crime rate index that includes all offenses of a particular type (e.g., "crimes of violence" or "crimes against property"), perhaps weighted as to seriousness of each class of offense.
4. Number and percent of populace committing "criminal" acts during the year. (This is a less common way to express the magnitude of the crime problem; it is criminal oriented rather than "crime oriented.")
5. Annual value of property lost (adjusted for price-level changes). This value might also be expressed as a percent of the total property value in the community.
6. An index of overall community "feeling of security" from crime, perhaps based on public opinion polls and/or opinions of experts.
7. Percent of reported crimes cleared by arrest and "assignment of guilt" by a court.
8. Average time between occurrence of a crime and the apprehension of the criminal.[2]
9. Number of apparently justified complaints of police excesses by private citizens, perhaps as adjudged by the police review board.
10. Number of persons subsequently found to be innocent who were punished and/or simply arrested.

B. FIRE PREVENTION AND FIREFIGHTING

Goal: To reduce the number of fires and loss due to fires.

1. Annual number of fires of various magnitudes (to be defined).
2. Fire rates, for example, number per 10,000 inhabitants per year.
3. Annual dollar value of property loss due to fire (adjusted for price level changes).
4. Annual dollar value of property lost due to fire per $1 million of total property value in the locality.
5. Annual number of persons killed or injured to various degrees of seriousness due to fires.
6. Reduction in number of fires, in injuries, in lives lost, and in dollars of property loss from the base. (These are primarily different forms of criteria 1, 3, and 5 and can be substituted for them.) This reduction might in part be obtained by, for example, drawing inferences from the number of fire code violations (by type) found.[3]
7. Average time required to put out fires from the time they were first observed, for various classes of fires.

Source: Harry P. Hatry, "Criteria for Evaluation in Planning State and Local Programs," A Study submitted by Committee on Government Operations, U.S. Senate (July 21, 1967), pp. 23-24.

CONTINUED

3 OF 4

effects can be attributed to a specific program or system, annual status monitoring concentrates on indicating general program-related changes. It does not indicate what part specific government activities have played in arriving at the desired levels, nor does it separate program effects from non-program efforts (e.g., by private groups). For example, a jurisdiction could group all activities which might conceivably have an impact on response time to calls for service, e.g. shared communications system, computer-assisted dispatch, provision of more patrol cars and fire engines, and improved road conditions. Then, if response time improves and no other plausible explanations can be found, the jurisdiction claims credit for the reduction but does not attempt to apportion the credit among the activities.

Such monitoring may also be an appropriate way for a shared communications system to start developing a program evaluation capability by providing the type of data base needed for successful evaluation. Also, because it is less detailed and does not require substantial resources, effectiveness status monitoring can provide system management and public officials with the type of data needed for system-wide evaluation.

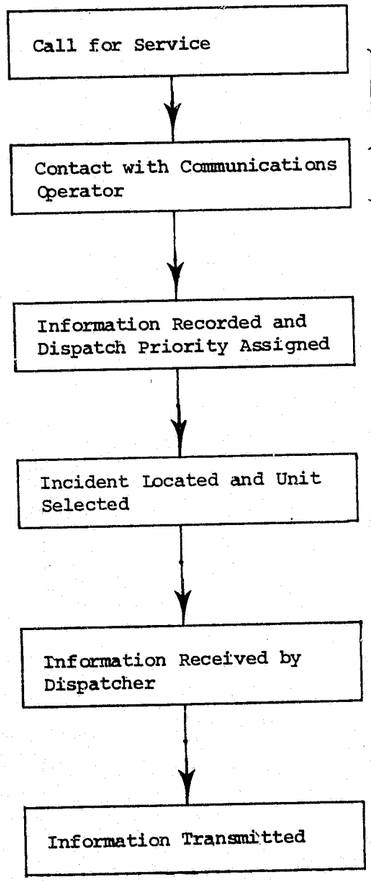
However, due to the attribution problem, most impact evaluations of shared communications systems are confined to studies of service quality. In particular, evaluations focus on reductions in average response time, i.e., the time from the beginning of the ring of an incoming telephone call until the dispatch message is sent.* Actually, response time is the sum of a series of time intervals or delays, as depicted in Exhibit 7.10. The exhibit also suggests minimum and maximum allowable elapsed times for each interval drawn from the experiences of several sharing arrangements. By identifying the operations associated with the critical or longest delays, a sharing arrangement can pinpoint the need for modifications.**

*This is more narrowly defined as "communications system" response time. Total response time would also include travel time for the dispatched unit to arrive at the incident scene.

**Much of this discussion has been adapted from: Public Technology Inc., Improving Productivity Using Work Measurement, pp. 103-106.

Exhibit 7.10

TIME INTERVALS IN CALCULATING AVERAGE RESPONSE TIME



	Time Estimates* (seconds) Least Likely	Highest Allowable
T1: Contact Time	0	60
T2: Telephone Conversation Time	12	300
T3: Information Recording Time	12	36
T4: Dispatcher Queue Delay	0	3600
T5: Dispatcher Service Time	6	60

*Source for time estimates was a Rand Institute study of response time for the Boston Police Department reported in 1977 by the National Science Foundation.

The first time interval, T1, is the time between initiation of a call for service (generally by telephone) and successful contact with a communications operator or complaint taker. The elapsed time for T1 depends on the rate of incoming calls, the rate at which incoming calls can be effectively serviced, and the number of operators and telephone receiving lines. In larger systems, incoming calls are distributed among the operators by means of an automatic call distribution device. If all operators are busy, incoming calls are stacked (queued), and as operators become available, calls are answered in the order they come in. It is possible to monitor the number of calls waiting and the average delay. A system can assign more communications operators as the incoming call rate increases so as to keep T1 below an acceptable limit.

The second time interval, T2, is the time required to record information from the caller on an incident card or other record. The communications operator not only must obtain information on the type of incident and name and address of the caller but also decide if the incident requires the dispatch of a police or fire unit and what priority to assign to the response. If it is determined that the call does not require a unit dispatch, the operator may transfer the call to a back-up operator who specializes in non-emergency matters. Operator training, simplified incident cards, computerized communications consoles, and specific dispatch priorities are methods of reducing excessive elapsed times at T2.

T3 is the time delay involved in identifying the location where the incident occurred so that an appropriate patrol or fire unit can be dispatched and the incident card conveyed to the appropriate dispatcher (if the dispatcher is someone else). One method for reducing this delay is to broadcast immediately the incident type and location of high priority calls to all units in the field. If available, the unit responsible for the incident's location can then respond, or a unit from a contiguous zone can respond if the primary unit is unavailable (similar to the "zone defense" in basketball). Other time reduction methods include specializing communications operators by jurisdiction, and having a geo-code file for computer-assisted dispatch which assigns the unit once the location is entered into the computer.

As incident cards are received by a dispatcher, they are stacked (also known as a dispatcher queue) to await assignment to a police or fire unit. The delay that an incident experiences in the queue is designated T4. If the queue results from calls arriving faster than the dispatcher can handle them, additional dispatchers can be assigned during busier hours. However, a much more serious cause of delay at this interval is because all available units are busy servicing other calls. If unit unavailability prompts unacceptably long delays, consideration should be given to expanding the dispatch zones and putting multiple units in each zone, encouraging inter-zone cooperation, holding units in reserve for high-priority calls, or even refusing to send patrol units to certain types of low-priority calls at times when most units are busy.

T5 is dispatch service time. It is the time required to broadcast the incident location and type to the appropriate unit. Dispatcher training and practice, incident codes, and geo-codes can reduce dispatch service time.

7.4 Special Considerations in Measuring System Process

A process evaluation studies the ways in which the system organizes and delivers its services. If an impact evaluation helps to answer the question "What did the system accomplish?" a process evaluation deals with "How did the system accomplish it?" A process evaluation looks at the system's internal workings and may uncover problems whose resolution may eventually improve the system's impacts or reduce its costs. A process evaluation can address not only operational matters such as communications and dispatch procedures but also budgeting, personnel administration, purchasing, and other components of system management.

Two kinds of evaluation criteria are typically measured in a process evaluation: workload and productivity.

- Workload: indicate amount of work actually done, e.g., number of calls for service handled, number of dispatchers hired, number of phone lines installed, number of units dispatched. A workload indicator can also denote the accomplishment of individual activities, e.g., whether a needed piece of equipment was installed or improved. Exhibit 7.11 is an analysis of selected workload objectives and evaluation criteria from the South Bay Regional Public Communications Authority.

Exhibit 7.11

SAMPLE PROCESS OBJECTIVES AND EVALUATION CRITERIA
(South Bay Regional Public Communications Authority)

OBJECTIVES	EVALUATION CRITERIA
1. Improve physical security of communications facilities	1.1 installation of access control system 1.2 provision of back-up radio coverage in case of power outage
2. Reduce ambient noise in dispatch facilities	2.1 separate police and fire communications from other operations 2.2 use of headset operations rather than speakers at dispatch console
3. Record all traffic on radio channels and emergency telephone lines	3.1 installation of individual tape channels at each complaint, dispatch, and supervisor console 3.2 installation of individual tape channel on each radio channel
4. Improve interdepartment radio communications among member departments	4.1 installation of common police tactical frequency 4.2 installation of common fire tactical frequency
5. Improve radio system security	5.1 installation of emergency power facilities at regional radio sites 5.2 installation of alarms at both sites for intrusion, fire, and equipment failures
6. Provide hot lines to local police and fire headquarters	6.1 provision of direct ring-down telephone service 6.2 installation of additional extensions on hot line 6.3 installation of voice paging system to announce fire dispatches

- Productivity: establish a relationship between resources used (expressed in dollar or manpower terms) and results obtained, e.g., calls for service per dispatcher, average dollar cost per dispatcher or service call handled.

Existing records and statistics provide information about the values of either type of criteria. The system's operations manager can provide operational data (compiled manually or computer-assisted). For management issues, the general manager or appropriate staff person is the most likely data source. In terms of evaluation designs, any of the four discussed previously could be applied in a process evaluation:

- Planned vs. Actual: comparing actual calls for service with planned calls;
- Before vs. After: comparing the average cost per dispatcher incurred by jurisdictions operating independently before the sharing arrangement with the average dispatcher cost after the arrangement commenced operations.
- Time Trend: comparing the projected total of calls handled per dispatcher assuming no sharing arrangement with the actual total per dispatcher employed by the shared communications system; and
- Inter-Jurisdictional Comparison: comparing the number and types of computer hardware and software installed by the shared communications system with the same equipment installed by independent jurisdictions or other sharing arrangements.

Observation is another common source of process evaluation data. Supervisors or independent professionals often observe the dispatching process in order to improve efficiency and assess the performance of communications operators and dispatchers. For example, operators may be rated on their telephone courtesy, i.e., the extent to which they use good manners and politeness in dealing with callers. Special attention is paid to the operators' facial expressions, bearing and actions, voice, and words. Possibly, a more objective use of observation is to evaluate the content of the operators' conversations. The observer tracks the progress of the telephone conversation from initial pick-up to termination, focuses on key elements, and rates the performance on each element. A sample observation form, based on the recommended telephone methods of the Northwest Central Dispatch System, is in Exhibit 7.12.

Exhibit 7.12

SAMPLE OBSERVATION FORM

Operator:_____ Employee ID#:_____

Observer:_____ Employee ID#:_____

Date of Observation:_____ Date of Report:_____

Evaluation Criterion	Rating (Circle 1 number)				
	Excellent		Average		Poor
1. Answer promptly (within three rings)	5	4	3	2	1
2. Identify yourself and your department	5	4	3	2	1
3. Speak directly into mouthpiece	5	4	3	2	1
4. Observe telephone courtesy	5	4	3	2	1
5. Take charge of the conversation	5	4	3	2	1
6. Take all information and write on complaint card	5	4	3	2	1
7. Explain waits	5	4	3	2	1
8. Avoid jargon or slang	5	4	3	2	1
9. Use the caller's name	5	4	3	2	1
10. Direct calls to proper agency	5	4	3	2	1
11. Advise supervisor when you leave phone position	5	4	3	2	1
12. Effective termination	5	4	3	2	1

Overall Comments:

7.5 Special Considerations in Measuring System Costs

Given the fiscal crisis confronting local governments across the United States, the issue of how much it costs to establish and operate a shared communications system is a pivotal concern. A comparison of the costs of sharing communications services versus operating them independently is an important element in the evaluation of a sharing arrangement. For, in economic terms, a shared communications system will be favored if it permits member jurisdictions to obtain either:

- the same communication system service at lower cost; or
- improved service at the same cost or at an increase in cost less than would have been incurred had jurisdictions continued to operate independently.

Determining what independent jurisdictions actually pay for communications is relatively simple because there are usually ample historical data on which to base an estimate. However, it is more difficult to estimate what these jurisdictions would have to pay for the same level of dispatching service if it were provided on a shared basis because they have very little historical data or cost accounting experience on which to base an estimate. The purpose of this section is to provide general considerations in measuring the costs of a shared system and in comparing those costs with independent dispatching. It is not a cost accounting primer since sufficient guidance on such techniques is available in the literature.*

7.5.1 Types of Cost

The costs of a communications system can be categorized as direct or indirect. A direct cost is an expense that can be assigned specifically to the communications system, e.g., wages and benefits of dispatchers, telephone and radio costs. An indirect cost is just as necessary for the functioning of the system but is not specifically and clearly assignable to the system because the system and other units incur the cost jointly, e.g., costs of lighting and heating a building in which the communications center and other municipal offices are housed.

---

*For example, see: Municipal Finance Officers Association of the United States and Canada, An Accounting Handbook for Small Cities and Other Governmental Units; National Institute of Justice, Measuring the Costs of Police Services by Kent John Chabotar (Washington, D.C.: U.S. Government Printing Office, 1982).

While the distinction between direct and indirect costs seems self-evident, situations are often encountered in practice which complicate the assignment of a specific cost to one category or the other. For example, consider the capital and annual operating costs of the building housing the sharing arrangement. In some arrangements, building costs are direct whereas in other arrangements these same costs are indirect. It all depends on how easily and credibly the cost can be allocated to the sharing arrangement. Building costs are likely to be direct in a sharing arrangement with its own communications center since only the arrangement occupies the space and its lighting, heating, maintenance, and other costs are readily isolated and measured. However, in the case of an agency supplier communications system in which the police headquarters of the supplying jurisdiction houses the communications center and a variety of other police services, it is not as easy to decide what percentage of the headquarters' lighting and heating expense is due to the sharing arrangement and what percentage is due to other activities. Another common problem is in categorizing administrative overhead costs as direct or indirect since this will also vary with the type of communications system. A system which does its own hiring, pays its own bills, and operates its own equipment can probably declare these costs as direct. Another system that relies on the personnel and finance departments of one of its member jurisdictions to perform these functions will treat the costs as indirect since the costs of these central departments must be shared by every municipal unit using their services, including the communications system.

In estimating the full costs of a communications system, the general rule is to measure its direct costs first. From job sheets, time cards, accounting journals and ledgers, and other source documents, the analyst can compile the personnel and nonpersonnel costs that can be assigned directly to the communications system. Next, the analyst totals the cost of the support units (personnel, budgeting, maintenance, etc.) and fixed assets (building, equipment, etc.) that the communications system uses in common with other departments. Finally, the analyst assigns to the communications system a fair proportion of these indirect costs based on the extent to which the system prompted those costs to be incurred. The assignment of indirect costs can be based on the system's percentage of total direct costs, total labor hours or dollars consumed, or any other allocation base that results in an equitable allocation of indirect costs. For example, if a municipality has

total direct costs of $100,000 and total indirect costs of $50,000, the indirect cost rate is 50% of the direct cost of any service within the municipality. Thus, if its communications system has direct costs of $20,000, the system's indirect costs are $10,000 and its full cost $30,000. Exhibit 7.13 illustrates how the full cost of a communications system might be estimated.

The exhibit shows that the communications system incurred $400,000 in total annual costs. Of this total amount, $300,000 was in direct costs and another $100,000 in indirect costs. In analyzing these data, it is important to note that:

- Costs for purchased equipment and building space do not represent their original purchase price. A key principle in cost analysis is that cost should reflect use. Since equipment and buildings are used for more than one year, their original costs should be apportioned (or "depreciated") among all the years in which they will be used. Equipment has an estimated useful life of 5-10 years whereas buildings can be expected to last 50 years. Thus, the original cost of a $1 million communications center is divided by its 50 years of estimated useful life to derive an annual building cost of $20,000.
- Labor hours were used to allocate a percentage of the city's total indirect costs to the communications system. Other allocation bases could have been used. Labor dollars is preferred by many accounting experts since this basis considers both the amount of time worked and the cost of that time.

7.5.2 Unit Costs

Once total costs are measured, it is possible to determine unit costs for the services offered by the communications system. A unit cost is derived by dividing the total cost by one or more measures of system input or output. Unit costs are excellent measures of system productivity and allow cost comparisons among systems of different sizes provided that their accounting systems are similar. For example:

Total Cost	÷ Input/Output Measure	= Unit Cost
$400,000	50,000 calls for service	$8.00 per call
$400,000	100,000 seconds saved in response time	$4.00 per second saved
$400,000	8,760 hours in operation	$45.66 per hour

Exhibit 7.13

HYPOTHETICAL CALCULATION OF THE ANNUAL FULL COST OF A COMMUNICATIONS SYSTEM

Procedure		Cost Accumulation	
1. Accumulate direct personnel costs			
a. Salaries:	1 General Manager	$ 25,000	
	13 Dispatchers	150,000	
	1 Administrative Aide	14,000	
	1 Secretary	11,000	$200,000
b. Fringe Benefits			
	Insurance		
	Pension/Social Security		
	Uniform		
	Other	35,000	$235,000
2. Accumulate direct nonpersonnel costs			
a. Purchased Equipment			
	Base station and transmitters		
	Communications consoles		
	Tape recorders		
	Status board and card slots		
	Portable and mobile radios		
	Office equipment	30,000	
b. Leased Equipment			
	Telephones		
	Emergency trunk lines	14,000	
c. Space (including maintenance)		20,000	
d. Supplies		1,000	65,000
3. Add a proportionate share of indirect costs			
Communications system consumes 10% of all labor hours in city government. Total city cost for management, budgeting, purchasing, and other support functions is $1 million of which 10% is allocated to the communications system as an indirect cost.			100,000
4. Total annual cost			$400,000

A good example of a cost evaluation using unit cost data can be found in the "Master Plan for Emergency Telecommunications Systems" developed by CES Telecommunications for the Northwest Central Dispatch System. Part of the plan studied the feasibility of integrating fire dispatching into the existing police dispatching at NWCDS. It included four jurisdictions that were already members of NWCDS (three of which had separate dispatch for police and fire while the fourth had centralized dispatch operations) and a fifth jurisdiction considering membership (with centralized dispatch operations).

Exhibit 7.14 presents information on fire dispatch cost activity for calendar years 1978 (actual) and 1979 (estimated). More specifically, it examines (1) resident population, (2) total fire dispatch labor cost, (3) number of runs, defined as a vehicle movement in response to an initial alarm, (4) cost/run, (5) cost/1,000 population, and (6) number of runs per day.

In this study, both runs and population were related to cost as effectiveness-cost measures. There is significant variation in both measures. The cost/1,000 population ranges from a low of $225 in 1979 to a high of $3,464. The cost/run ranges from a low of $3.54 in 1979 to a high of $32.57. The jurisdiction with the highest unit costs on both measures (EGVFD) had high labor costs and comparatively low population and runs.

7.5.3 Intergovernmental Cost Comparisons

It is often tempting for managers and analysts to conduct inter-jurisdictional cost comparisons with total and unit cost data. A police chief in a jurisdiction considering joining a sharing arrangement may want to know how the projected costs of the arrangement compare with the actual costs his department has incurred for communications. The manager of a shared communications system is frequently curious about how his costs compare to costs incurred by other systems. Unfortunately, these analyses can be very misleading unless it is recognized that differences in reporting costs may not be due to differences in management efficiencies or service quality but to differences in the jurisdictions being compared or the accounting methods used to compile costs. For example, there may be different:

- definitions of what constitutes "full" cost;

Exh 7.

UNIT COST ANALYSIS

(Northwest Central Dispatch System)

Department	Resident Population	Year	Dispatch Cost	Runs	Cost/Run	Cost/1000	Runs/1000	Runs/Day
AHFD	72,000	78	$ 64,465	4,514	$ 14.28	$ 895	63	12.37
		79	69,261	4,514	15.34	962	63	12.37
BGFD	16,000	78	2,096	900	2.33	131	56	2.47
		79	3,600	1,017	3.54	225	64	2.79
EGVFD	27,000	78	77,430	2,818	27.48	2,868	104	7.72
		79	93,527	2,872	32.57	3,464	106	7.87
MPFD	62,000	78	45,000	3,701	12.16	726	60	10.14
		79	52,046	3,701	14.06	840	60	10.14
TOTAL	177,000	78	$ 188,991	11,933	$ 15.84	$1,068	67*	32.69
		79	$ 218,434	12,104	$ 18.05	$1,234	68*	33.16
RMFD	20,000	78	$ 8,153	1,866	$ 4.37	$ 408	93	5.11
		79	$ 8,225	2,151	$ 3.82	$ 411	10	5.89
GRAND TOTAL	197,000	78	$ 197,144	13,799	$ 14.29	$1,001	70*	37.81
		79	$ 226,659	14,255	$ 15.90	$1,151	72*	39.05

- dispatch or communications procedures;
- cost of living in region served;
- laws and regulations governing sharing arrangements; and
- services rendered to member jurisdictions.

Therefore, careful study and analysis of the jurisdictions or systems being compared is necessary to ensure that they are indeed comparable.

* * *

Chapter 7 has presented general guidelines and considerations for evaluating a shared communications system. It has suggested a basic "logic of evaluation" applicable to all the aspects of a system being evaluated in order to ascertain their effectiveness and efficiency. It has also argued that there are special considerations to be made when the evaluator is interested in measuring a system's impact, processes, or costs.

Next, Chapter 8 departs from shared communications and attempts to apply the major principles of service sharing to other police services, including records, detention, and training. Chapter 8 is not intended to provide as comprehensive a treatment to these other services as has been accorded to communications. Nevertheless, it does suggest the most important opportunities and problems involved in operating other sharing arrangements.

Chapter 8

CONSIDERING OTHER SERVICE SHARING ARRANGEMENTS

Sharing support services can provide an opportunity to reduce costs, improve existing services, and develop new services. Many different services can be shared, and law enforcement agencies across the country have benefitted from a variety of sharing arrangements:

- In California, a shared automated warrant promotes the safety of field officers in eight counties.
- In Alabama, a regional training academy offers courses in response to the educational concerns of its members.
- In Florida, law enforcement agencies in one county obtained in-depth police applicant testing by sharing a personal selection service.
- In Ohio, the Miami Valley Regional Crime Laboratory was organized to serve forty local agencies which were dissatisfied with the services provided by the state laboratory.
- In Massachusetts, police agencies formed a joint purchase group to negotiate a substantial discount on the purchase of police vehicles.
- In Washington, local police lock-ups failed to meet state standards, and a shared detention center was established to meet the confinement needs of agencies countywide.

In addition, police departments which find sharing one support service beneficial will often explore the possibility of sharing other support services. For example, the towns which organized the Northwest Central Dispatch System for cooperative communications also participate in the North West Municipal Conference which provides joint personnel selection. This chapter examines support services, other than communications, which police departments frequently share:

(1) Records and data processing;
(2) Training;
(3) Personnel selection;
(4) Equipment and facilities;
(5) Crime laboratories; and
(6) Detention facilities.

Sharing arrangements for these "standard" services can permit police departments to acquire advanced technologies or special capabilities within each

service type. For example, sharing enabled some of the respondents in our survey to enhance their standard services by computerizing recordkeeping, adding psychological screening to recruit selection tests, obtaining helicopters or other specialized crime detection equipment, and constructing computerized evidence rooms. Despite the specialized nature of these services, each of the shared systems was established by applying the same general principles described throughout this document.

This chapter begins with a brief summary of the steps for establishing a shared system which are discussed in chapters 2 through 7 of this document. The next section examines each of the six support services individually. The treatment of each service includes: (1) a description of the service; (2) a comparison of advantages and disadvantages of sharing the service; and (3) a chart of special considerations for sharing the particular service.

8.1 The Sharing Process

As stated in the beginning of this Issues and Practices Document, the same general considerations and procedures apply to developing any sharing arrangement, from communications to detention facilities. Communications was selected as a focus for two reasons. First, communications is critical to the provision of direct police services--it is the primary means for control of patrol units and public access to police services. Secondly, shared communication services illustrate the entire range of implementation issues faced in service sharing arrangements--issues of local crime, legal authority, political opposition, technology, management, staffing, organization, and evaluation. The development of shared arrangements for other support services tends to be a more flexible process, and these arrangements generally face fewer implementation issues than shared communications systems. For instance, a regional police academy will not require a technical feasibility study, and a shared building will not necessitate personnel training, service procedures, nor a recordkeeping system. However, only the level of effort required to implement a shared system will differ for each support service; the basic steps for developing and operating the arrangements remain constant for all.

(1) Planning a shared system requires a thorough investigation and careful design to ensure that the arrangement meets the needs and expectations of its members.

(2) Organizing involves establishing an institutional structure and a decision making process which will facilitate operations, maximize local control, and minimize interagency conflict.

(3) Managing includes the efficient acquisition and productive utilization of the system's human and financial resources.

(4) Operating a shared system means obtaining the proper facilities and equipment, professionally handling the demand for services, and keeping accurate records.

(5) Evaluating means collecting the proper information and examining that information in order to monitor and improve the system.

As discussed in the following sections, virtually every police support service can be provided through a shared arrangement, resulting in lower costs to member agencies and increased opportunity for improved services and facilities.

8.2 Records and Data Processing

> The officer pulls over the blue Mercedes on a traffic violation and radios the station for outstanding warrants on the driver. The records clerk checks the index cards on warrants and finds nothing. The officer issues the driver a citation and sends him on his way. Unfortunately, the department's manual records did not contain the outstanding federal warrant on the driver.

Recordkeeping is an essential police support service. Police management depends on administrative records as well as other information to forecast future workload, labor allocation, and resource needs. Police investigation uses past history records, suspect files, and other tactical information. Police field services must rely on the accuracy of warrant files. The ability to retrieve and organize information accurately and quickly can be vitally important to the effectiveness of police work. A well-defined police records system contains five types of information necessary to meet basic operational and management needs:

1) dispatch information to increase the efficiency of assigning units and provide a record of police response time;

2) event information to compile crime statistics, such as UCR;

3) case information to index offenders, victims, events, to follow up the investigation including court action, and to provide management information needs;

4) reporting and access to other data systems to provide information for operations or statistical analyses; and

5) patrol and investigative support data not available from external systems, such as local property data.*

For over a decade, the criminal justice system has been experiencing an "information explosion." Information management has become central to processing cases and coordinating law enforcement efforts at all levels of the justice system--from criminal investigations to case disposition to compilation of national statistics. Automated recordkeeping has played a significant role in expanding, facilitating, and improving the recordkeeping function. For example, in 1968, ten states had automated state criminal justice information systems and by 1972, forty-seven states had some computerized state level records.**

Despite the increasing importance and volume of police records in most departments, many police agencies still rely on index cards, ledgers, and manila folders to maintain their records. Indeed, most of the survey respondents interviewed in all support service areas primarily relied on manual recordkeeping systems. Manual systems impede the fast retrieval needed by field and investigative officers and decrease the analytic capabilities of management. For example, a manual warrant check can take several minutes, while an automated scan takes seconds. By computer, a police manager can contrast many different patterns of resource allocations and assess their impact on the department's budget, whereas time constraints on collecting, organizing, abstracting, and calculating from paper records might effectively limit the examination to just a few options. In this respect, computerizing administrative functions such as personnel information, fiscal and accounting records, can be highly advantageous.

To some extent, agencies' computerized record needs are best met on a federal or state level. For example, the National Crime Information Center

*U.S. Department of Justice, Law Enforcement Assistance Administration, Criminal Justice System, by the National Advisory Commission on Criminal Justice Standards and Goals (Washington, D.C.: U.S. Government Printing Office, 1973).

**Ibid.

(NCIC) provides data on wanted felons and the identification numbers of stolen weapons, vehicles, and serial numbered property. At the state level, computerized criminal history (CCH) files contain the identification, location, characteristics and description of known offenders. These systems reduce duplication of effort and costs while increasing the data base available to police. However, some of the local level data needs described above require in-depth information not available on the federal and state systems. Sharing data processing can fulfill local automation needs and offer additional benefits.

While individual departments can obtain hardware to gain access to federal and state criminal justice data banks, or purchase microcomputers for their internal data needs, these systems may be unaffordable and even underutilized for many smaller departments. In fact, our survey results indicated that the agencies which had automated records were either large metropolitan departments or shared systems. However, by combining records systems on a regional basis, departments can obtain the speed and accessibility of an automated system at lower cost. Specifically, these systems allow agencies to:

- Increase accuracy and efficiency of the recordkeeping function while decreasing duplication of effort. For example, Project CLEAR in the Cincinnati area provided a single computerized recordkeeping system for 38 agencies.*
- Access computerized records at a reduced cost by joining agency purchasing power. For example, Bi-State Metro Computer is a private firm which does some law enforcement data processing (20% of its workload). Fourteen police agencies in Illinois and Iowa jointly contracted this firm to provide their data processing needs.

In addition, regional services offer the unique advantage of an expanded information base, allowing departments to:

- Increase police safety by combining records for an entire region. For example, the Police Information System (PIN) is a warrant system operated by the Alameda County Sheriff on a contract basis. The purpose of the system is to enhance the safety of field officers by providing fast and accurate information regarding warrants countywide.

*U.S. Department of Justice, Law Enforcement Assistance Administration, "Project Clear--County Law Enforcement Applied Regionally--Final Report to LEAA," Washington, D.C., no date.

- Track criminal activities within a region. For example, CORPUS in Alameda County supplies information on adult and juvenile criminal histories and bookings. This type of regional information prevents transient criminals from avoiding detection by crossing jurisdictional borders.

In addition, sharing a countywide basis may permit direct interface of all local criminal justice component systems--police, courts and corrections. A county-level system can often reconcile the differing boundaries of these three entities.

Many of the benefits available from sharing records were realized by a shared system in Connecticut. The New Haven Police Department provides automated recordkeeping to eighteen surrounding towns. The arrangement was initiated for several reasons: New Haven wanted to defray their costs, the towns wanted automation and access to New Haven's data, and the state wanted a shared system so only one telephone line would be needed for the area (as opposed to 19 separate dedicated telephone lines). Consumers are charged a fee based on usage--the number of records maintained. The largest consumer pays $4,000 a year. The system provides regional data and is interfaced with state data. Members are particularly pleased with the ability to obtain an immediate check on outstanding warrants and priors in the entire area. They also realize that without the sharing arrangement only New Haven would be automated. One respondent to the survey who was particularly enthusiastic stated, "It's the best law enforcement tool there is! The system contains all complaints from barking dogs to murder. There is also a complete listing of aliases and we can survey crime in the entire area. It is unreal!"

The disadvantages cited by survey respondents are generally associated with any computer system and are not unique to shared systems:

- line officer reluctance to readily accept and rely upon automated records;
- delays occurring when the computer is "down;" and
- adjustment to any lag time between input and receipt of printouts.

Interestingly enough, several respondents noted that while officers vehemently opposed the computer system when it was instituted, they rapidly came to depend on it and even refuse to go to manual back-up records when the system is down.

While the accessibility of computers is increasing, the survey also identified shared arrangements on manual recordkeeping systems. These systems were organized by the sheriff and the police department for the county seat. Shared recordkeeping was based on an agency supplier model, where the consumer either paid for the services or provided a different support service for the supplier (barter). Several important purposes can be served by these arrangements:

- Lower costs can be achieved by fully utilizing resources and eliminating duplicative costs.
- Reducing duplication of effort is possible by maintaining single copies of documents both agencies need.
- Monitoring area crime is facilitated by sharing records on both the sheriff's county operations and police operations for the county's largest city.
- Increasing interdepartmental coordination is promoted by combining criminal histories and warrants for officers and crime statistics for managers.

Shared manual recordkeeping systems are usually developed where the sheriff and police also share a building. Where the agencies are housed in different buildings, problems arise because the consumer agency must telephone for information or go over to the records center to pick up and deliver records.

Special Considerations for Sharing Recordkeeping and Data Processing

Planning

- Planning must include decisions on the extent to which recordkeeping will be computerized and criteria for periodic purging of files.
- An optimal geographical membership must be selected but this is much more flexible than with communications. However, an agency supplier model is used to share manual records between two overlapping jurisdictions of relatively equal size.
- Technical expertise is essential for planning informational needs, developing software, and selecting hardware.

Organizing

- A mechanism which allows for consumer agency input (e.g., governing board) is important for agency supplier arrangements. Consumers need to have a voice in determining the type of information to be maintained and the format of statistical reports which are generated.

Managing Personnel and Financial Resources

- Automated systems will typically hire technical staff with the requisite skills; however, dispatchers are typically trained to operate the system and provide field officers with the information requested.

Operating

- Operational aspects of sharing records must be carefully coordinated with police communications, field and tactical operations, and agency management.

Obtaining Facilities and Equipment

- Equipment needs should be assessed by an expert.
- Facility location is flexible.

Evaluating

- Sharing arrangement can be evaluated on the basis of level of use, record accuracy, ease and speed of retrieval or cost savings.

Further Sources of Information

- The Criminal Justice System* is a good reference on the uses and needs of criminal justice information systems.

*U.S. Department of Justice, Law Enforcement Assistance Administration, Criminal Justice System.

8.3 Police Training

The rural town has experienced a rash of suspicious fires over a period of several months. The public is angry about the property damage and worried about future fires. The police department has no experience or training in arson investigation. While the police chief would like to gain some departmental expertise, he cannot afford the time or cost of sending an officer to the state capitol for a seminar on arson.

The issue of required training for police is a fairly recent phenomenon; serious interest in the area has only accelerated over the past thirty years. There are two types of training for police: basic training for recruits; and in-service training for officers, including both refresher courses and advanced specialized instruction.

Since the late 1960s, states have been establishing minimum training requirements for recruits. In 1973, the National Advisory Committee on Criminal Justice Standards and Goals recommended a minimum of 10 weeks of basic training. States in our survey required 8-12 weeks of basic training at an approved institution. At a minimum, training for recruits must meet state-mandated minimum training standards, and should address the four primary functions of police service: non-crime situations (e.g., first aid); crime prevention; emergency crime fighting; and administration (e.g., ethics and professionalism). Because departments must now meet state minimum training requirements for recruits, many states alleviate the financial burden of recruit training by reimbursing departments for the tuition and sometimes furnishing travel and living expenses as well. In addition, some states provide free training at a state academy.

In contrast to recruit training, state standards for in-service training are minimal or non-existent. By and large, in-service training is left to the discretion of individual departments, although states may require recertification of certain skills such as firearm proficiency, CPR, and/or first aid.

The mandatory training standards found in state statutes are often supplemented with a legislative mechanism to ensure the quality of training programs, such as establishing a state training board. However, the actual system of training recruits, as established by statute, varies widely across states. For example, autonomous training boards mandated by statute may

actually operate a state academy; they may certify, but not operate, academies; or they may operate and certify academies. In New Mexico, a board-certified academy may in turn certify one-time local training for recruits. Another variation, for example, is found in Minnesota, where officers need to obtain an associate degree, pass a state-certified test, and then successfully complete local department training.

While some states have established state-level academies which provide all basic and in-service training needs, a number of states do not have law enforcement academies and local departments must provide their own program to meet state requirements. This can create problems for smaller departments. Where attendance at a state-certified program is required, small agencies often cannot provide sufficient services to obtain certification for their own training program. Even where program certification is not required, individual agency training efforts are frequently fractionalized and sporadic. On the other hand, even in states which have state-level academies or other established programs (often at local universities), police agencies' use of these facilities may be constrained by several factors:

- insufficient capacity at the state level to handle all local training needs;
- prohibitive travel and boarding costs for agencies located far from the training center;
- dissatisfaction with course offerings; and
- insufficient manpower reserves to allow officers the "leave time" to attend training sessions.

Many police departments have found that shared regional academies offer the optimal solution to these problems. In states with no state-level facilities, the primary advantage of shared regional training is improved service. A regional training academy can meet state standards (including certification), by providing members with a comprehensive training program. Thus, individual agencies can avoid the expense and difficulty of obtaining their own training certification, while gaining access to a better training program. In states with existing academies, regional training may still be a preferable option primarily to increase accessibility to training. This can be particularly important where existing academies consistently waitlist

recruits or are unable to accommodate agency demand for in-service training.

Shared regional academies can also offer several other important advantages:

(1) Increased in-service training to small agencies. Unlike individual or state training programs, shared systems may meet the needs of small agencies for in-service training. For example, in one regional system the instructor will go to the police department if at least ten officers will attend.* Several metropolitan police departments offer free advanced seminars to smaller surrounding agencies.

(2) Focus on local or regional problems. Shared systems can better address police concerns which are local in nature and develop courses suggested by members. For example, one system in Alabama has emphasized regional problems through training on family crisis intervention and auto safety.**

(3) Cost effectiveness. Shared systems can provide training at a lower cost than individual department training programs. For example, in suburban Los Angeles, agencies found sharing saved overtime pay for department instruction, and increased both uniformity and the quality of training.***

(4) Decreased travel time and costs. Shared regional training centers may be more advantageously located for members than state-level academies. For example, some survey respondents noted that attendance at the state-level academy required significant travel and boarding costs, whereas the officers could commute to the regional center on a daily basis.

(5) Promotion of uniformity. Unlike local training programs, shared systems can maximize uniformity across neighboring jurisdictions. For example, one survey respondent reported that uniform training of state police and local police significantly eased hostilities between the two.

---

*George T. Felkenes, "A Regional Training Approach," Police Chief (August, 1974), pp. 39-41.

**Ibid.

***Lyle Knowles and Richard Propster, "Regional Training for Reserve Police Officers," California Law Enforcement, pp. 96-99.

(6) Alleviate manpower concerns. Shared systems can also accommodate the scheduling problems of members better than most state academies. Many small departments in our survey reported that although the state academies offered in-service training, they did not attend because of manpower shortages. However, members of a shared training system can adjust course scheduling to minimize manpower shortages. Courses may be scheduled for "slow" times, on a half-day basis, and so forth.

These advantages are particularly important to smaller agencies which need in-service training. The only disadvantage of regional sharing reported by members was that recruits were not trained on individual town ordinances and department procedures.

Where training demand is insufficient to support a regional academy, an agency supplier system may meet the in-service training needs of smaller departments. Such a system usually arises when a large metropolitan agency with its own in-service training opens classes to nearby departments. In some cases, the supplier offers the instruction gratuitously, in others a fee per student is charged. While an agency supplier system enhances the training opportunities of small agencies, some survey respondents complained that the supplier's departmental procedures often dominated the course presentations.

A final type of cooperative interdepartmental training, which is related to sharing, is educational exchange programs. Under these programs, departments exchange officers for a given period of time. For example, one system exchanges line officers for one week to increase training despite manpower shortages.* Another program exchanges middle management for six months.** The goals of these programs include the exchange of new ideas and procedures, increase interdepartmental communications and understanding, and to expose officers to different environments (e.g., small town police get metropolitan experience).

*G.B. Adams, "Law Enforcement Interdepartmental Education Exchange Program," Police Chief 6 (April, 1973), pp. 22-23.

**William J. Baer, Police Personnel Exchange Programs: The Bay Area Experience (Washington, D.C.: The Police Foundation, 1976).

Special Considerations for Sharing Personnel Training

Planning

- Shared training systems are typically either a joint powers arrangement on a regional basis or agency supplier in a metropolitan area.

Organizing

- If the regional training center establishes a board of directors, it should be composed not only of line officials but also departmental representatives expert in training and organizational development.
- Center staff who assess training needs and effectiveness should not be the same persons who conduct the training in order to avoid conflicts of interest.

Managing Personnel and Financial Resources

- Shared training academies and selection services typically maintain a very small core staff of full- or part-time personnel for administration. Instructors and evaluators are drawn from a pool of local expertise--member departments, universities, federal agencies, etc.
- A shared training system usually receives tuition payments from the state for recruits and from members for in-service training.

Operating

- Careful assessment of consumer needs is important for selecting and scheduling courses and establishing a curriculum.

Obtaining Facilities

- Training facilities should either be centrally located for day classes (which reduce boarding costs), or have adequate facilities for resident students.

Evaluating

- Members will want to assess whether the program is meeting local needs and whether it is cost effective. Measures of training effectiveness can include not only the extent to which training improved knowledge, attitudes, or skills but also whether training enhanced on-the-job performance.

Further Sources of Information

- The Manual for the Design and Implementation of Training* provides comprehensive information on developing a training program.
- U.S. Department of Justice, Law Enforcement Assistance Administration, National Manpower Survey of the Criminal Justice System, Vol. V, Criminal Justice Education and Training, by the National Planning Association (Washington, D.C.: U.S. Government Printing Office, 1976).

*U.S. Department of Justice, Law Enforcement Assistance Administration, Manual for The Design and Implementation of Training, by Richard Grassie, James Burrows, Suzanne White, and Ray Waymire (Integrated Criminal Apprehension Program, 1978).

- U.S. Department of Justice, Law Enforcement Assistance Administration, Project STAR, Role Performance in the Criminal Justice System, Vol. I, Summary, by the American Justice Institute (Sacramento, California: American Justice Institute, 1974). See also the ten associated Project STAR reports on specific topics.

8.4 Personnel Selection

A young applicant to the police department is taking his fifth entry examination for admission as a recruit; he has previously failed to gain entry in four neighboring communities. Each of the five towns has individually paid screening costs for this single applicant.

The selection of recruits raises issues germane to departments of all sizes. Agencies in close proximity may unknowingly duplicate selection costs by individually screening, examining, and investigating applicants who have been rejected by a neighboring department. Smaller agencies lack the resources to thoroughly assess any candidates. Both of these problems can be solved by sharing a screening service. The experiences of two shared systems illustrate this point.

A number of police departments in northwestern Chicago suburbs were concerned about both the cost and effectiveness of examining police candidates, realizing that individual departments were paying $34 to $52 per testing cycle to screen some of the same people. The police and fire commissioners from seven towns undertook a study to explore the possibility of cooperative service provision. The study showed that the towns could reduce excessive costs and duplication of effort while retaining local control by establishing a joint powers system to provide selection service. This system, the Northwest Municipal Conference, tests candidates and submits a list of eligible candidates and their test results to each member agency. Applications are sent only to the member(s) indicated by the candidate (i.e., there is no "master" list). The testing process is both comprehensive and unique:

(1) orientation night covers the details of the testing and selection processes, as well as a film on expected traumas for a new officer and his or her family;

(2) a physical agility test (developed to conform to member agencies' job requirements and approved by the members);

(3) two written examinations (as some members prefer one exam over the other, this provides members with a choice of test results upon which to rely);

(4) background investigation on all finalist candidates;

(5) polygraph and in-depth psychological examinations; and

(6) oral interviews by departments.

The total cost of the first police testing cycle in May 1978 was $7,470 for all seven departments combined. Based on their average cost of $38 per applicant for individual department testing, members estimated their combined savings to be at least $20,000.*

In Pinellas County, Florida, a shared countywide selection service has worked to solve screening problems, particularly for small agencies. This system allows for members to refer applicants and to specify special requirements or requests (e.g., waive agility test for 60-year-old clerical candidate). In order to fund the system, members obtained legislation which earmarks $1 from every county traffic ticket for its operation. The testing includes written exams, oral exams, physical tests, criminal checks, credit checks, reference verification, medical exam, and a psychological exam. The benefit for the small departments is significant. Respondents in our survey stated before the service was available they could not afford to conduct a thorough applicant review. One agency said, "We used to just make a few phone calls; now we get a report an inch thick." Another advantage cited by a small agency was that the system permits easy identification of police officers applying from out-of-state, and officers who came to Florida to retire, but now want to come out of retirement. These officers may be given preference in hiring since they can be certified easily by the Florida State Police, and departments thereby avoid recruit training.

So long as departments participate in establishing selection requirements and retain ultimate control over candidate selection, there appear to be no disadvantages associated with sharing this function.

---

*William G. Grams and William H. Muhlenfeld, "Police Recruitment is a Joint Effort in Chicago Suburbs," Illinois Police Officer, Vol. 9, No. 4 (Winter 1978), pp. 25-33.

Special Considerations
for Sharing Personnel Selection

Planning

- Shared selection systems are predominantly based on joint powers agreements.

Organizing

- A governing board is recommended to ensure adequate and continuing member input on issues concerning selection criteria.

Managing Personnel and Financial Resources

- Selection arrangements may be paid on a fee per candidate basis.
- Only part-time staffing is needed for the periodic testing cycles. For this reason, it may be helpful to hire consultants to run and evaluate each cycle or to use member departments' training officers.

Operating

- Because full-time personnel are not needed, it is important to regularly check members' recruit needs in order to schedule testing cycles.

Obtaining Facilities

- To reduce costs, movable physical testing equipment may be purchased and the testing location may rotate among member agencies. In this way, no permanent facilities are required. Another option is to locate the system at a nearby training academy.

Evaluating

- Evaluation should measure cost savings and assess the quality and performance of officers hired in accordance with the testing recommendations.

Sources of Further Information

- Police Selection and Career Assessment* is a good resource for developing methods of evaluating applicants and assessing the potential for present officers for promotion.

---

*U.S. Department of Justice, Law Enforcement Assistance Administration, National Institute of Justice, Police Selection and Career Assessment, by Marvin D. Dunnette and Stephan J. Motowidlo (Washington, D.C.: U.S. Government Printing Office, 1976).

8.5 Facilities and Equipment

The police department has four squad cars which are all at least six years old. Mechanical failures are a frequent occurrence and have interrupted police operations on several occasions. The chief has submitted cost proposals for replacement of the vehicles, but the city council is suffering from "sticker shock" and refuses to appropriate the funds.

While the law enforcement function is becoming increasingly dependent on technical equipment, local budgetary constraints force departments to forego needed equipment or to use antiquated machinery. While effective policing is largely dependent on the quality and number of personnel, adequate facilities and equipment are essential to enable the staff to carry out their policing functions. For example, officers' lives can depend on the reliability of their cars, weapons, and radios. Similarly, the public safety can turn on the availability of emergency equipment such as "the jaws of life" or bomb detection dogs. Facilities for storing and acquiring evidence such as polygraphs are important to criminal prosecutions.

Facilities and equipment comprise an extremely comprehensive support service area, encompassing such diverse support activities as the purchase of police weapons and maintenance of the police headquarters. The one common feature of most law enforcement facilities and equipment is cost: these items are expensive, often involving considerable capital expenditures on the part of police agencies. For example, major equipment purchases for such items as police vehicles, helicopters, or underwater recovery equipment costs thousands of dollars, while the cost of construction for a new police headquarters building may well exceed a million dollars. Expenditures of this magnitude are not insignificant for larger departments; for smaller departments, they may be totally unaffordable. Sharing arrangements for the provision, purchase, or development of certain facilities and equipment thus offer a unique and attractive option for most police agencies.

Shared equipment and facilities can be divided into two categories. The facilities category includes stationary equipment, and covers such items as buildings, evidence rooms, and polygraphs, while the equipment category is composed of moveable equipment such as helicopters, riot gear, and special detection dogs. Unlike other shared support services, departments may share

facilities and equipment in three ways: joint powers and agency supplier arrangements, and a third option called a joint purchasing group. This third form of arrangement is used exclusively for equipment commonly purchased by police departments, such as vehicles and radios. These groups have adopted the industrial technique of bulk purchases through joint purchasing arrangements. By combining the buying power of several departments, higher discounts can be obtained.

The primary advantage of sharing equipment and facilities is, of course, cost savings. Through shared arrangements member departments may obtain the benefits of certain facilities and equipment at a fraction of their total cost. For example, provision of helicopter service in San Bernardino, California costs $480,000 a year--a price few single departments can afford. However, by sharing the helicopter the individual costs are reduced: the second largest consumer pays $54,000 a year and one smaller member pays only $6,000. Supplier agency sharing of facilities and equipment offers similar benefits: smaller departments can afford to use the service because their individual costs are low, while supplier departments use the cost contributions of participating agencies to cover their fixed operating costs or invest in more advanced technology and equipment. Joint purchase arrangements allow members to negotiate lower prices on necessary equipment; because members of a group purchase then have identical equipment, additional cost savings may be realized through group repair and service contracts which reduce maintenance costs.

Another major advantage of cooperative provision of facilities and equipment is the potential access to new and better equipment and facilities. This advantage is available because the combined funds of several agencies, or the savings realized from a joint purchase arrangement, may allow members to invest in better equipment. For example, a shared evidence room produced startling organizational benefits in Bernalillo County, New Mexico. Law enforcement agencies there had been plagued by lost evidence due to poor organization and limited storage capabilities. Substantial amounts of time were wasted searching for evidence. A modern evidence room supplied by the Albuquerque Police Department ended the evidence problems for nine member agencies. Increased efficiency and computer capability reduced the average time needed to locate evidence from one hour to three minutes. Advanced

technology was obtained in the form of an automated retrieval system, refrigerated compartments, moisture-proof rooms, storage for flammable items, and vaults. A second example is provided in the Pottstown, Pennsylvania area, where a shared system allowed the supplier agency to purchase a fully automated breathalyzer to replace the old manually operated one. The new machine provides an evidentiary advantage in court by eliminating the necessity of establishing the operator as an expert. Furthermore, the high reliability of the machine means the results are more likely to be accepted by the court.

Shared facilities and equipment may also improve the quality of agencies' direct services by increasing the scope of direct services an agency can provide. Special detection dogs can promote investigations and avert disasters, while the availability of riot gear facilitates comprehensive police service during public disturbances. The new capabilities afforded by helicopter service or the availability of underwater recovery equipment can substantially enhance agencies' patrol and investigation services. (It should be noted that although access to new technology is desirable, agencies should be aware that expert vendors sometimes sell equipment which is too complex or sophisticated to operate without advanced technical training.)

Participants in sharing arrangements for facilities and equipment may encounter two major disadvantages:

- inability of the facility or equipment to accommodate the level of demand placed upon it; and
- rising costs.

First, the capacity of a shared facility must be balanced against the demand for service, since an overburdened system will result in dissatisfaction among its members. When equipment or facilities are frequently unavailable, consumers may find it difficult to justify the financial burden of participation, and may leave the shared arrangement. To counteract this problem, it is often helpful if members can agree on a priority system for the service. For instance, if a mobile crime lab receives two calls simultaneously, the call involving the most perishable evidence or the most serious crime might be serviced first.

Traditionally, large agencies have provided use of facilities and equipment as a free service to smaller agencies. Our telephone survey reflects a growing dissatisfaction by overburdened suppliers, and a shift to contract provision. While smaller consumers may complain at having to pay,

often the equipment or facilities are used only sporadically, and a cost based on actual use may turn out to be minimal. Moreover, the service they receive under contractual arrangements may be of higher quality, as the supplier may be able to provide advanced technology and increased availability. The Bernalillo County, New Mexico evidence room system has met no opposition to its proposed charge of $1.25 per item. For contractual provision, a transition to an actual use cost basis for an operating system is feasible, and such a formula is recommended for developing systems. In addition, it is recommended that other costs involved in shared facilities and equipment, such as insurance, training, maintenance and replacement costs, be explicitly considered and incorporated in costing formulas as appropriate.

By and large, developing a sharing arrangement for facilities and equipment is easier than sharing communications. However, as shown in the table below, agencies should carefully consider several important differences.

Special Considerations
for Sharing Facilities and Equipment

Planning

- Geographical jurisdiction sets practical limits on the membership of shared buildings. If two agencies want to share a building, their jurisdictions must overlap geographically. For that reason, the most common membership for a shared building consists of the county sheriff and a police department (usually located in the county seat). Additional sharing is possible with the state police or highway patrol. Intermunicipal sharing of buildings is usually infeasible, as one member would be housed outside of its jurisdiction. In addition, where any equipment or facility is basically stationary, as with a firing range, travel time and costs will effectively limit membership.
- Balancing of work capacity and costs per member will be the primary determinants of membership size for an equipment sharing arrangement. Enough members are needed to minimize the costs to individual consumers, but not so many as to overload the equipment. Arrangements for sharing certain types of equipment are capable of incremental expansion to accommodate new members (e.g., riot gear); however, other types of equipment, once filled to capacity, are not easily expanded due to the substantial initial investment required (e.g., helicopter).
- The geographical configuration of membership also must be carefully evaluated where the equipment is movable. Members should be sure the equipment will be able to meet their needs in terms of response time, accessibility, additional costs of moving the equipment, and projected frequency of use.

- Joint purchase membership offers infinite variation. The only limiting factor is that more than one agency is required. A large membership is often preferable because of the fluidity it affords: with more members participating, it is more likely that several can be found who want to join in a given purchase. Moreover, with a greater number of members, a larger purchase can be made and subsequently a higher discount obtained.
- Each individual piece of equipment or facility often has a host of associated legal considerations. Members of a shared system must comply with federal, state, local, judicial and/or departmental standards. For example, a helicopter system will have to meet federal regulations promulgated by the Civil Aeronautic Board. In addition, state and local laws require operating licenses, mechanical inspections, pilot certification, flight liability insurance, and so forth. Judicial limitations may exist for air surveillance techniques, negligent operation of aircraft, nuisance or noise levels, and so on. In contrast, a shared building may only have to meet local zoning restrictions, obtain a building permit, and pass a state building inspection. In short, shared systems must meet the same legal prerequisites as individual agencies providing the same service.

Managing Personnel and Financial Resources

- Selection requirements for staff will vary widely depending on the type of equipment or facility shared. In some cases, special expertise may be needed, such as a helicopter pilot; in other cases, members may simply train their own officers to operate the equipment.
- The type of staff required will also vary; for example, a shared building will need a maintenance crew either especially hired to work full-time in the building or contracted from a private cleaning service.
- Many states require licensed polygraph examiners which should be considered in staffing a shared polygraph.
- With respect to joint purchasing, members share costs and pay individually rather than paying from a centrally maintained treasury.

Operating

- Operating a shared system for facilities or equipment will also vary widely according to what is shared. For example, joint provision of major facilities will often require formal operating supervision, while a joint purchase may simply involve coordination among one member from each department.
- Members should carefully assess their insurance needs, to protect both the property shared and injury to users.

Evaluating

- Members must concern themselves with evaluating costs, availability of the items upon demand, workload processed, and effectiveness on direct service provision.

Further Sources of Information

- Police* discusses issues involved in evaluating and purchasing certain types of police equipment.

8.6 Crime Laboratory

The state crime laboratory is located 120 miles from the police agency and does not provide technicians for evidence collection at major crime scenes. The officers collect their own evidence and drive it up to the state laboratory. It often takes more than a month to receive the analysis results. Then, even if the results are vital to a criminal prosecution, the state laboratory cannot afford to provide the expert witnesses needed at the trial.

Effective investigation of many crimes, such as homicide, arson, and rape, may often depend on laboratory services to discover clues, reconstruct events, develop suspects, and relate suspects to specific acts. In drug-related offenses, chemical analysis is used to verify the criminal activity occurred. To meet these needs, ideally, a laboratory should offer three basic services:

(1) Evidence collection at major crime scenes to ensure samples are of adequate size, not contaminated, properly stored, and chain of custody procedures are observed;

(2) Analysis of evidence to correctly identify substances; and

(3) Court testimony at trial to verify skills and methods of analysis and help the court interpret the meaning of the analysis through expert testimony.

Despite the need and demand for laboratory services, most states do not have an adequate laboratory system. For example, as late as 1979, one state did not have any laboratories; fifteen states had only one; and seven had only two.** The scarcity of laboratories is primarily due to expensive equipment

*U.S. Department of Justice, Law Enforcement Assistance Administration, Police, by the National Advisory Commission on Criminal Justice Standards and Goals (Washington, D.C.: U.S. Government Printing Office, 1973).

**Michael S. Serrill, "Forensic Sciences: Overburdened, Underutilized," Police Magazine (January 1979), pp. 22-30.

and the tremendous cost of providing skilled staff. Moreover, the availability of laboratories has been further aggravated as large laboratories have been forced to restrict their services because they have reached a saturation point. State laboratories restrict service to analysis only; large urban laboratories have cut their service areas and instituted fees; and with the federal budget cuts, the FBI and ATF laboratories have notified local police agencies that they will no longer handle evidence from crimes which are primarily local in nature.

At the same time the supply of laboratory services has decreased, demand has risen. This can be attributed to a number of factors:

- increased drug-related crimes which often require analysis;
- U.S. Supreme Court decisions limiting the use of confessional evidence and thereby turning police emphasis to physical evidence;
- judicially-mandated standards for handling analysis and the use of physical evidence; and
- police recognition of the persuasiveness of scientific evidence in court.*

Sharing a laboratory is a viable solution for police departments faced with service problems relating to availability, proximity, timeliness, and quality. The experience of agencies in northern Illinois illustrates the use of sharing as a successful option to alleviate service pressures. In 1965, the Chicago Crime Laboratory provided free services for 140 jurisdictions, but by 1968, rising demand, crime rates, drug arrests, and court appearances forced the laboratory to limit its services to Cook County. This action left northern localities with the options of using the state laboratory system which did not provide crime scene service, or organizing a regional laboratory of their own. The towns in Lake County decided to organize, finance, and govern a cooperative laboratory--the first shared regional laboratory in the United States. Financing obstacles were overcome by establishing the Northern Illinois Police Crime Laboratory on a nonprofit, tax-exempt basis, so they could receive private donations to help fund the effort. The facility offers crime scene evaluation and searches, chemical analysis, court

*U.S. Department of Justice, Law Enforcement Assistance Administration, Crime Laboratory Proficiency Testing Research Program, by Joseph Peterson, Ellen Fabricant, Kenneth Field (Washington, D.C.: U.S. Government Printing Office, October 1978).

testimony, seminars and classes on evidence, and a task force to perform to perform major crime scene work.* Since 1968, other cooperative regional crime laboratories have been successfully organized. In addition to traditional services, the survey results showed these systems also performed evidence collection training. A good example is provided by the Miami Valley Regional Crime Laboratory in Dayton, Ohio. In addition to full laboratory services, this laboratory provides evidence training for officers of member departments. Classes are limited to three officers and consist of intensive in-house instruction, followed by street work, and concluded with more in-house training. In addition, trained officers receive materials and supplies for evidence collection--an important benefit for departments which cannot afford to purchase proper supplies.

The advantages of sharing a crime laboratory are significant:

(1) Low cost service is provided through sharing expenditures as opposed to maintaining an individual agency laboratory. The cost of a $20,000 gas chromatograph is affordable for most departments--if divided among 40 departments.

(2) Improved service is realized by sharing, in that departments no longer need to rely on overburdened state laboratories nor be satisfied with their own limited capabilities (typically only photographic processing).

(3) Increased effectiveness can be obtained where an independent laboratory is established, by providing an objective image to the public, criminal defense bar, and juries.

On the other hand, there are limitations to sharing a laboratory. When state services are available, they are generally free of charge, whereas a shared laboratory must be financially sustained by its members. A 1978 study conducted by the Forensic Sciences Foundation found that about 0.5% of police budgets were spent for laboratory work.** A shared system would most likely increase this level of expenditure. As with any police laboratory, shared laboratories may also suffer from high staff turnover rates. The high level of training necessary to develop certain experts (e.g., a serology expert may require 3-5 years of training), coupled with traditionally low law enforcement salaries, makes some technical staff prime targets for pirating

*M.F. Bonamart, "A Regional Crime Lab for Northern Illinois," Police Chief, 36 (May, 1969), pp. 18-21.

**Michael S. Serrill, "Forensic Sciences: Overburdened, Underutilized," pp. 22-30.

by other government agencies and private industry.* However, with one exception, survey respondents cited no disadvantages associated with sharing; in contrast to respondents using state laboratories who complained of long turn-around time, failure to set priorities, travel time, and lack of testimony service.

Developing a shared crime laboratory parallels the development of a shared communications facility. One primary difference will be convincing opponents to abandon a free service by explaining the merits of paying for improved service. Laboratory systems also differ in that expansion can more easily be accommodated. For example, the Rochester state police laboratory was enlarged in 1961 to operate countywide, and 10 years later was expanded to a regional basis to serve an 8-county area. As shown in the table below, establishing a crime laboratory also avoids such problems as equipment incompatibility, need for comprehensive staff training, unifying diverse operating procedures, and so forth.

Special Considerations for Sharing a Crime Laboratory

Planning

- Workload projections must be made both to meet consumer demand and to determine the type and quantity of specialized labor and equipment to meet the demand.
- The operational safety standards of OSHA and appropriate state agency must be researched. For example, chemical storage, acid showers, and adequate ventilation are often overlooked. Retrofitting these items into an existing facility is extremely expensive and can be avoided through proper planning.

Organizing

- A solid organizational structure is important due to the technical nature of the service and the need for public perception of objectivity. One system has found that the use of a governing board composed of county coroners serves both of these purposes--the board is non-political and can address technical activities, analyses, and departmentation.
- Management of the crime laboratory should be entrusted to someone with both technical expertise and administrative ability because of the high volume of paperwork.

*Ibid.

Managing Personnel and Financial Resources

- Laboratory staff must be hired with requisite skills to insure compliance with technical standards in their respective fields, e.g. ballistics, serology, toxicology.
- Turnover of existing staff will be a major problem unless compensation is competitive with private industry.
- Charges for services are typically assessed pursuant to a formula (e.g., % usage and % of population) or on an hourly rate.

Operating

- An important operating objective will be to maintain quality controls to meet legal evidentiary requirements, to prioritize caseload, and to ensure rapid turnaround.
- Legal evidentiary requirements, for example, can be met by insuring proper storage and maintaining chain of custody.
- Caseload can be prioritized effectively by convening periodic meetings of member jurisdictions to assess projected caseloads and assigned analysis priorities.

Obtaining Facilities and Equipment

- Incompatibility of existing individual agency equipment (if any) is rarely a problem; however, when obtaining new equipment, careful assessment must be made of needs, workload, and cost.
- A central location may be advantageous both for the delivery of samples to the laboratory and to send lab technicians into the field.

Evaluating

- The success of a shared laboratory can be measured in terms of consumer satisfaction, and results in court (e.g., accuracy of analysis, strength of expert testimony).

Further Sources of Information

- Crime Laboratory Proficiency Testing Research Program* is an interesting examination of the accuracy of testing and the effectiveness of the nation's laboratory system.

8.7 Detention Facilities

The county jail is nearly 130 years old, the floors are sagging and the first floor ceiling is caving in. The building is both dangerous to prisoners and costly to maintain. The structure has been condemned thirty times by grand juries. Despite the sad condition of the jail, the county simply cannot afford improved facilities.

This dilemma is faced by an alarming number of law enforcement agencies nationwide. Faced with increasing demand for all types of detention facilities--for police lock-ups to hold arrestees (usually 48-hour detention), and county jails or detention centers to detain defendants before trial and house convicted offenders--agencies are caught between a dire need for adequate facilities and the inability to fund the effort. The costs of constructing and operating detention facilities are substantial. For example, the first Rural Regional Detention Center in the United States, with a capacity for 65 detainees, cost $325,000 to build in 1971.* More recently, survey respondents nationwide reported minimum operating costs of $16-$28 a day per prisoner. For years many agencies have used antiquated structures to avoid the cost of updating their facilities. For instance, in the early 1970s, LEAA reported that 25% of local detention facilities were over fifty years old and 6% were over one hundred years old.** Over one-third of the survey respondents reported the major impetus for sharing was that their own detention facilities had been condemned.

Within the past decade, state legislatures and courts have begun to mandate minimum standards for local detention facilities. These standards typically require sanitation features such as running water and flush toilets, twenty-four hour surveillance of prisoners, safety precautions such as sprinkler systems, and required segregation of different types of detainees such as juveniles and adults. The inability to meet state standards has forced the closing of many jails and lock-ups, thus increasing the pressures on marginally adequate facilities. The problem of antiquated and inadequate detention facilities is also exacerbated by rising arrest rates and public opposition to increasing custodial costs.

There are a number of significant advantages to sharing detention facilities. The most common benefits cited by survey respondents include:

*U.S. Department of Justice, Law Enforcement Assistance Administration, National Institute of Justice, Crime Laboratory Proficiency Testing Research Program.

*"County Achievement Award: Liberty County, Georgia's Regional Detention Center Lightens Burden on Area Jails," The American County (June 1971), pp. 9-11.

**U.S. Department of Justice, Law Enforcement Assistance Administration. Corrections, by the National Advisory Commission on Criminal Justice Standards and Goals (Washington, D.C.: U.S. Government Printing Office, 1973).

- Improved Service. Most respondents found sharing costs permitted them to rehabilitate a structure or build a new facility that they could not have afforded on their own.
- Cost Effectiveness. Respondents often felt sharing a detention facility saved money; that is, that they only pay for the services they need--typically a daily rate per prisoner. If they had their own facility, they would incur fixed maintenance costs even when their cells were empty.
- Increased Capabilities. When sharing can be implemented on a large scale, the opportunity for increasing capabilities is substantial. For example, a centrally located regional detention center in Georgia holds pretrial defendants for five counties and houses convicted offenders for eight additional counties. Prior to sharing the members all used severely inadequate facilities. The key features of the detention center include:

  --Segregation of felons, misdemeanants, juveniles, women, and isolation quarters, which serve to increase the center's capabilities. The facility also separates convicted and accused prisoners. This type of separation meets state standards and reduces security problems.

  --Hospital facilities are provided for timely medical attention, and a padded cell is available for disturbed prisoners. The provision of prompt medical services is particularly important for detention centers. A five-year study of deaths in police custody found almost half of the fatalities occur within the first twenty-four hours after incarceration. Frequent causes of death while in police custody included: alcohol withdrawal syndrome, usually within the first three days; drug overdose, alcohol poisoning, alcohol-related falls, usually within the first few hours; and suicides, usually within the first day.*

  --Auxiliary facilities are provided for rehabilitation of prisoners sentenced to serve in a county jail (typically sentences less than one year) and for training law enforcement officials. Moreover, office space was constructed for the county sheriff and city police of the locality in which the facility is located. A similar facility in South Carolina combined lock-up facilities and the courthouse in a new structure.

*"Jail and Prison Deaths: A 5-Year Statewide Survey of 223 Deaths in Police Custody, North Carolina, 1972-1976," by Page Hudson, M.D. and John Butts, M.D., Office of the Chief Medical Examiner, North Carolina and University of North Carolina, Chapel Hill.

The disadvantages of sharing a lock-up are usually not serious. Transportation time to take prisoners to the lock-up is the primary disadvantage. This drawback can be minimized by a centrally located facility. Survey respondents were less likely to object to transport time when the lock-up was located in or near the courthouse, because most prisoners would have to be taken there eventually in any case. Another problem is inadequate capacity. A few respondents were dissatisfied because the supplier sometimes had to turn away police with prisoners. The saturation problem can be avoided, however, by accurate planning for multi-agency use.

Developing a shared lock-up facility is similar in many respects to sharing communications, but in general, the process is simpler. Shared lock-up systems tend to be more readily accepted by police, government, and the community. The details of service are also less complex than for communications. Special considerations for the development of a shared lock-up arrangement are presented below.

Special Considerations for Sharing Detention Facilities

Planning

- Shared detention facilities are predominantly agency supplier arrangements. When resources are very limited, mutual contracts are sometimes used, e.g., one agency houses male prisoners and the other houses females and juveniles.
- Newly constructed facilities tend to be established on a regional basis, which increases available financing, and they are established under a joint powers arrangement.

Organizing

- Management of the shared detention facility is performed by the sheriff in an agency supplier arrangement or by a specially appointed jail manager in joint provision arrangements.

Managing Personnel and Financial Resources

- Detention facilities are increasingly employing civilian detention officers. Civilians should receive formal training in jail management.

- Suppliers typically charge consumers a daily rate per prisoner. In the survey daily rates ranged from $16 to $34. One system in Arkansas is funded solely through traffic fines.

Operating

- In the context of detention, it is important to address booking procedures and procedures for handling difficult prisoners.

Obtaining Facilities

- The physical facilities are central to this service provision and should be carefully planned with respect to effective security, adequate medical facilities, and other state standards.
- Consultation with an architect specializing in prison design is recommended.

Evaluating

- Management will be interested in measuring both consumer satisfaction (e.g., space availability, costs) and prisoner security (e.g., deaths, injuries, escapes).

Further Sources of Information

- The Manual of Standards for Adult Correctional Institutions* and Corrections** may provide a useful starting point to identify legal prerequisites and political obstacles.

8.8 Summary

As this chapter and Exhibit 8.1 demonstrate, support service sharing can be extended to a variety of police services, ranging from communications and recordkeeping to training and laboratories to equipment and detention facilities. Motivated by necessity, a desire to improve services, and the appeal of cost savings, many law enforcement agencies across the country have

*Standards: Manual of Standards for Adult Correctional Institutions, by the Commission on Accreditation for Corrections, 1977.

**Corrections, by the National Advisory Commission on Criminal Justice Standards and Goals, 1973.

Exhibit 8.1

THE ADVANTAGES AND LIMITATIONS OF SHARING SEVEN SUPPORT SERVICES

Support Service	Advantages	Disadvantages
Communications	• increased technical capabilities • comprehensive service provision • increased public safety • reduced costs or increased cost effectiveness • improved direct services	• officer resistance • complex organizational and management structure • rising costs and workload
Records and Data Processing	• increased police safety • increased accuracy and efficiency • gain automation at reduced costs • track criminal activities	• officer resistance • computer induced delays
Police Training	• increased in-service training • focus on local training needs • promote uniform training	• lack of training on individual town ordinances and department procedures
Personnel Selection	• cost-effective recruit selection • improved testing capabilities	• none
Facilities and Equipment	• cost savings • access to new and better equipment and facilities • improved direct services	• overburdened equipment and facilities • rising costs
Crime Laboratory	• low cost for service obtained • increased types of service and faster turnaround • increased effectiveness of physical evidence in court	• members are charged a fee • staff turnover
Detention Facilities	• increased capacity • cost effectiveness • improved safety • enhanced facilities	• transportation time • overburdened capacity

sucessfully shared support services. The systems described in this document clearly illustrate that careful planning and a cooperative spirit are the key to realizing the benefits of sharing. Many shared arrangements have failed when members did not anticipate obstacles or were divided by local jealousies and "turf" battles. Given the current government budgetary constraints and the responsibility of public agencies to provide the best service possible at a reasonable cost, sharing support services offers a sound opportunity to police departments in the 1980s.

APPENDICES

APPENDIX A

STATES WITH STATE PLANNING AGENCY

STATES WITH STATE PLANNING AGENCIES*

ALABAMA

Alabama Law Enforcement Planning Agency
2863 Fairlane Drive, Executive Park
Building F, Suite 49
Montgomery, Alabama 36116

ALASKA

Department of Public Safety
Pouch N
Juneau, Alaska 99811

ARIZONA

Office of Economic Planning
and Development
Criminal Justice Unit
Executive Tower, Room 405
1700 W. Washington
Phoenix, Arizona 85007

ARKANSAS

Arkansas Crime Commission
Department of Finance and
Administration
P.O. Box 2485
Little Rock, Arkansas 72203

CALIFORNIA

Office of Criminal Justice Planning
9719 Lincoln Village Drive, Suite 602
Sacramento, California 95827

COLORADO

Department of Local Affairs
Division of Criminal Justice Affairs
1313 Sherman Street, Room 419
Denver, Colorado 80203

CONNECTICUT

Connecticut Justice Commission
Division of Justice Planning
Office of Policy Management
75 Elm Street
Hartford, Connecticut 06106

Source: This list was developed and published by the National Criminal Justice Association in November 1982, and updated in April 1983.

*Due to funding reductions, the SPA function in some states is no longer handled by a separate agency and is housed, as indicated, in the Governor's office or under another agency.

STATES WITH STATE PLANNING AGENCIES

DELAWARE

Delaware Criminal Justice Planning Commission
Carvel State Office Building, 4th Floor
820 North French Street
Wilmington, Delaware 19801

DISTRICT OF COLUMBIA

Office of Criminal Justice Plans
and Analysis
420 7th Street, N.W., 2nd Floor
Washington, D.C. 20004

FLORIDA

Bureau of Criminal Justice Assistance
2571 Executive Center Circle East
Tallahassee, Florida 32301

GEORGIA

Criminal Justice Coordinating Council
Balcony Level
East Tower
205 Butler Street, S.E.
Atlanta, Georgia 30334

HAWAII

State Law Enforcement Planning Agency
250 S. King Street, Room 412
Honolulu, Hawaii 96813

IDAHO

Police Services Division
Department of Law Enforcement
6081 Clinton Street
Boise, Idaho 83704

ILLINOIS

Illinois Criminal Justice
Information Authority
120 South Riverside Plaza
Room 1016
Chicago, Illinois 60606

INDIANA

Indiana Criminal Justice Planning Agency
215 N. Senate, Graphic Arts Building
First Floor
Indianapolis, Indiana 46202

STATES WITH STATE PLANNING AGENCIES

IOWA

Iowa Crime Commission
Lucas State Office Building
Des Moines, Iowa 50319

KANSAS

Systems and Procedures Section
Division of Accounts and Reports
Department of Administration
State Office Building
Topeka, Kansas 66612

KENTUCKY

Department of Justice
State Office Building, 5th Floor
Frankfort, Kentucky 40601

LOUISIANA

Louisiana Commission on Law Enforcement
and Administration of Criminal Justice
1885 Wooddale Boulevard, Room 610
Baton Rouge, Louisiana 70806

MAINE

Maine Criminal Justice Planning and
Assistance Agency
State House Station No. 88
Augusta, Maine 04333

MARYLAND

Maryland Criminal Justice
Coordinating Council
One Investment Place, Suite 700
Towson, Maryland 21204

MASSACHUSETTS

Committee on Criminal Justice
100 Cambridge Street, 21st Floor
Boston, Massachusetts 02202

MICHIGAN

Office of Criminal Justice
Lewis Case Building, Second Floor
Lansing, Michigan 48909

STATES WITH STATE PLANNING AGENCIES

MINNESOTA

Criminal Justice Programs
Department of Energy, Planning
and Development
Room 100 Hanover Building
480 Cedar Street
St. Paul, Minnesota 55101

MISSISSIPPI

Criminal Justice Planning Division
Office of the Governor
P.O. Box 139
Jackson, Mississippi 39205

MISSOURI

Department of Public Safety
621 East Capitol
P.O. Box 749
Jefferson City, Missouri 65102

MONTANA

Board of Crime Control
303 North Roberts
Scott Hart Building, 4th Floor
Helena, Montana 59620

NEBRASKA

Nebraska Commission on Law Enforcement
and Criminal Justice
301 Centennial Mall South
P.O. Box 94946
Lincoln, Nebraska 68509

NEVADA

Department of Motor Vehicles
State Capitol
Carson City, Nevada 89710

NEW HAMPSHIRE

New Hampshire Crime Commission
11 Depot Street
Concord, New Hampshire 03301

NEW JERSEY

Division of Criminal Justice
Department of Law and Public Safety
25 Market Street
CN-085
Trenton, New Jersey 08625

STATES WITH STATE PLANNING AGENCIES

NEW MEXICO

Corrections Department
113 Washington Avenue
Santa Fe, New Mexico 87501

NEW YORK

State of New York
Division of Criminal Justice
Services
Executive Park Tower
Stuyvesant Plaza
Albany, New York 12203

NORTH CAROLINA

Governor's Crime Commission
P.O. Box 27687
Raleigh, North Carolina 27611

NORTH DAKOTA

Criminal Justice Training and
Statistics Division
Attorney General's Office
State Capitol Building
Bismarck, North Dakota 58505

OHIO

Office of Criminal Justice
Services
P.O. Box 1001
Columbus, Ohio 43216

OKLAHOMA

Criminal Justice Service Division
Department of Economic and Community
Affairs
Lincoln Plaza Building, Suite 285
4545 N. Lincoln Boulevard
Oklahoma City, Oklahoma 73105

OREGON

Oregon Crime Watch
Board of Police Standards and
Training
325 13th Street, N.E., Suite 404
Salem, Oregon 97310

STATES WITH STATE PLANNING AGENCIES

PENNSYLVANIA

Pennsylvania Commission on Crime
and Delinquency
P.O. Box 1167
Federal Square Station
Harrisburg, Pennsylvania 17108

RHODE ISLAND

Rhode Island Governor's Justice
Commission
222 Quaker Lane, Suite 100
West Warwick, Rhode Island 02893

SOUTH CAROLINA

Division of Public Safety Programs
Edgar A. Brown State Office Building
1205 Pendleton Street
Columbia, South Carolina 29201

SOUTH DAKOTA

Division of Law Enforcement Assistance
South Dakota Department of Public Safety
118 West Capitol
Pierre, South Dakota 57501

TENNESSEE

Tennessee State Planning Office
505 Dedrick Street
Suite 1800
Nashville, Tennessee 37219

TEXAS

Governor's Office, Criminal
Justice Division
P.O. Box 12428, Capitol Station
Austin, Texas 78711

UTAH

Utah Council on Criminal
Justice Administration
4501 South 2700 West
Salt Lake City, Utah 84119

VERMONT

Vermont Commission on the Administration
of Justice
5th Floor Pavillion Office Building
109 State Street
Montpelier, Vermont 05602

STATES WITH STATE PLANNING AGENCIES

VIRGINIA

Department of Criminal Justice
Services
805 E. Broad Street
Richmond, Virginia 23219

WASHINGTON

Criminal Justice Section
Division of Accounting and
Fiscal Services
Office of Financial Management
AL-01
Olympia, Washington 98504

WEST VIRGINIA

Office of Economic and
Community Development
Criminal Justice and Highway
Safety Unit
5790-A MacCorkle Avenue, S.E.
Charleston, West Virginia 25304

WISCONSIN

Wisconsin Council on Criminal
Justice
30 West Mifflin
10th Floor, Suite 1000
Madison, Wisconsin 53702

WYOMING

Attorney General's Planning Committee
on Criminal Justice Administration
720 West 18th Street
Cheyenne, Wyoming 8200

APPENDIX B

SOURCES OF FURTHER INFORMATION

SOURCES OF FURTHER INFORMATION

1. Association of Centralized Communications Directors, Planning Guide for Consolidated Communications Centers, by the Telecommunications Management Committee (Wheaton, Illinois: Association of Centralized Communications Directors).

2. California Council on Criminal Justice, Feasibility of a Coordinated Records and Communications System for Region XI (San Jose, California: Public Systems Incorporated, 1971).

3. Connecticut Justice Commission, Connecticut Law Enforcement Communications: A Radio Network Plan, by John McDonnell and Elliot Silverstein (Cambridge, Massachusetts: Abt Associates Inc., 1977).

4. Eastman, George D. and Samuel G. Chapman, Short of Merger: Countywide Police Resource Pooling (Lexington, Massachusetts: D.C. Heath and Company, 1976).

5. Norrgard, David L., Regional Law Enforcement: A Study of Intergovernmental Cooperation and Coordination (Chicago, Illinois: Public Administration Service).

6. Pock, Max A., Consolidating Police Functions in Metropolitan Areas (Ann Arbor, Michigan: The University of Michigan Law School, 1962).

7. U.S. Department of Housing and Urban Development, Office of Policy Development and Research, Interlocal Service Delivery: A Practical Guide to Intergovernmental Agreements/Contracts for Local Officials, by National Association of Counties Research Foundation (Washington, D.C.: U.S. Government Printing Office, 1977).

8. U.S. Department of Justice, National Institute of Law Enforcement and Criminal Justice, An Exemplary Project: Central Police Dispatch, by John J. McDonnell (Washington, D.C.: U.S. Government Printing Office).

9. U.S. Department of Justice, National Institute of Law Enforcement and Criminal Justice, Illinois Police Communications Study, Phase Two, by Associated Public-Safety Communications Officers, Inc. (New Smyrna Beach, Florida, 1969).

10. U.S. Department of Justice, National Institute of Justice, Selected Bibliography: Police Consolidation, by Margaret Emig and Marjorie Kravitz (Washington, D.C.: U.S. Government Printing Office, 1980).

APPENDIX C

MODEL STATE STATUTE

A MODEL STATUTE AUTHORIZING INTERSTATE SHARING*

[Title should conform to state requirements.]

(Be it enacted, etc.)

Section 1. Purpose. It is the purpose of this act to permit local governmental units to make the most efficient use of their powers by enabling them to cooperate with other localities on a basis of mutual advantage and thereby to provide services and facilities in a manner and pursuant to forms of governmental organization that will accord best with geographic, economic, population and other factors influencing the needs and development of local communities.

Section 2. Short Title. This act may be cited as the Interlocal Cooperation Act.

Section 3. Public Agency Defined. (a) For the purposes of this act, the term "public agency" shall mean any political subdivision [insert enumeration, if desired] of this state; any agency of the state government or of the United States; and any political subdivision of another state.

(b) The term "state" shall mean a state of the United States and the District of Columbia.

Section 4. Interlocal Agreements. (a) Any power or powers, privileges or authority exercised or capable of exercise by a public agency of this state may be exercised and enjoyed jointly with any other public agency of this state, and jointly with any public agency of any other state or of the United States to the extent that the laws of such other state or of the United States permit such joint exercise or enjoyment. Any agency of the state government when acting jointly with any public agency may exercise and enjoy all of the powers, privileges and authority conferred by this act upon a public agency.

(b) Any two or more public agencies may enter into agreements with one another for joint or cooperative action pursuant to the provisions of this act. Appropriate action by ordinance, resolution or otherwise pursuant to law of the governing bodies of the participating public agencies shall be necessary before any such agreement may enter into force.

(c) Any such agreement shall specify the following:

1. Its duration.

2. The precise organization, composition and nature of any separate legal or administrative entity created thereby together with the powers delegated thereto, provided such entity may be legally created.

3. Its purpose or purposes.

4. The manner of financing the joint or cooperative undertaking and of establishing and maintaining a budget therefor.

5. The permissable method or methods to be employed in accomplishing the partial or complete termination of the agreement and for disposing of property upon such partial or complete termination.

6. Any other necessary and proper matters.

(d) In the event that the agreement does not establish a separate legal entity to conduct the joint or cooperative undertaking, the agreement shall, in addition to items 1, 3, 4, 5 and 6 enumerated in subdivision (c) hereof, contain the following:

(continues)

*The Council of State Governments, Suggested State Legislation on Interlocal Cooperation (Lexington, Kentucky: The Council of State Governments, 1957).

1. Provision for an administrator or a joint board responsible for administering the joint or cooperative undertaking. In the case of a joint board public agencies party to the agreement shall be represented.

2. The manner of acquiring, holding and disposing of real and personal property used in the joint or cooperative undertaking.

(e) No agreement made pursuant to this act shall relieve any public agency of any obligation or responsibility imposed upon it by law except that to the extent of actual and timely performance thereof by a joint board or other legal or administrative entity created by an agreement made hereunder, said performance may be offered in satisfaction of the obligation or responsibility.

(f) Every agreement made hereunder shall, prior to and as a condition precedent to its entry into force, be submitted to the attorney general who shall determine whether the agreement is in proper form and compatible with the laws of this state. The attorney general shall approve any agreement submitted to him hereunder unless he shall find that it does not meet the conditions set forth herein and shall detail in writing addressed to the governing bodies of the public agencies concerned the specific respects in which the proposed agreement fails to meet the requirements of law. Failure to disapprove an agreement submitted hereunder within [....] days of its submission shall constitute approval thereof.

[(g) Financing of joint projects by agreements shall be as provided by law.]

Section 5. Filing, Status, and Actions. Prior to its entry into force, an agreement made pursuant to this act shall be filed with [the keeper of local public records] and with the [secretary of state]. In the event that an agreement entered into pursuant to this act is between or among one or more public agencies of this state and one or more public agencies of another state or of the United States, said agreement shall have the status of an interstate compact, but in any case or controversy involving performance or interpretation thereof or liability thereunder, the public agencies party thereto shall be real parties in interest and the state may maintain an action to recoup or otherwise make itself whole for any damages or liability which it may incur by reason of being joined as a party therein. Such action shall be maintainable against any public agency or agencies whose default, failure of performance, or other conduct caused or contributed to the incurring of damage or liability by the state.

Section 6. Additional Approval in Certain Cases. In the event that an agreement made pursuant to this act shall deal in whole or in part with the provision of services or facilities with regard to which an officer or agency of the state government has constitutional or statutory powers of control, the agreement shall, as a condition precedent to its entry into force, be submitted to the state officer or agency having such power of control and shall be approved or disapproved by him or it as to all matters within his or its jurisdiction in the same manner and subject to the same requirements governing the action of the attorney general pursuant to Section 4(f) of this act. This requirement of submission and approval shall be in addition to and not in substitution for the requirement of submission to and approval by the attorney general.

Section 7. Appropriations, Furnishing of Property, Personnel and Service. Any public agency entering into an agreement pursuant to this act may appropriate funds and may sell, lease, give, or otherwise supply the administrative joint board or other legal or administrative entity created to operate the joint or cooperative undertaking by providing such personnel or services therefor as may be within its legal power to furnish.

Section 8. [Insert severability clause, if desired.]

Section 9. [Insert effective date.]

APPENDIX D

INTERSTATE COMMUNICATIONS SHARING

INTERSTATE COMMUNICATIONS SHARING

As shown in Exhibit 1, there are three alternative legal bases for establishing a shared communications system with members from more than one state. Two types of statutes authorize multistate sharing: (1) interstate joint powers authorization and (2) an interstate compact. A third type of law, (3) incorporation under a Not-for-Profit law, provides a legal basis for the system but does not authorize sharing per se.

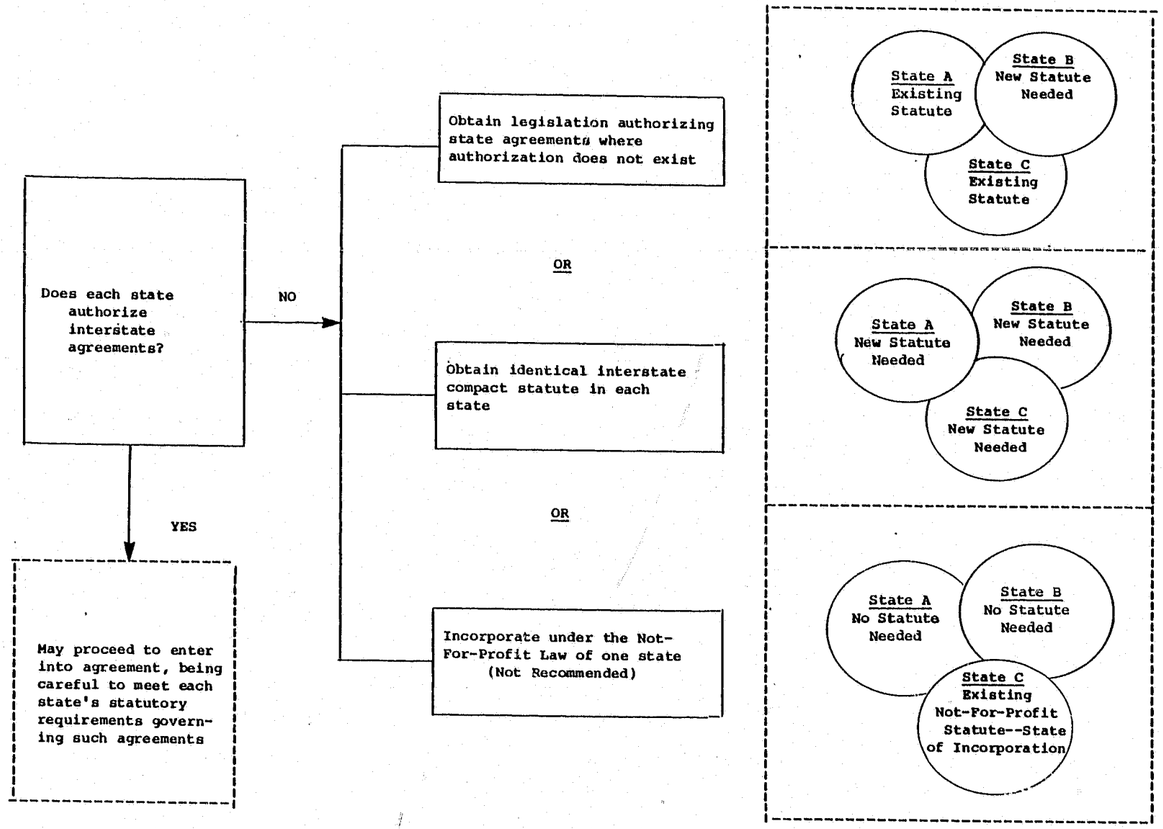
(1) Authorization for Interstate Sharing. As noted previously, two or more governmental entities cannot cooperatively exercise their powers without express state authorization. This means agencies from two (or more) states can establish a shared system only if the law in both (all) states expressly authorizes interstate sharing. Increasingly, interstate sharing is being authorized for contiguous jurisdictions. The same state law which permits jurisdictions within the state to share may also authorize interstate sharing. When one member is in a state which does not provide for interstate sharing, there are two options: (1) seek new authorizing legislation in that state, or (2) establish the system on a different legal basis.

(2) Interstate Compacts. Where all members' states do not authorize interstate sharing, an alternative approach is an interstate compact. An interstate compact is a statute which establishes a single shared system between specifically designated participants. The primary disadvantage to the interstate compact approach is that each state legislature must enact the exact same version of the compact. Because the compact only affects one portion of the state, the compact will not interest most of the legislature and passage tends to be slow. However, once an interstate compact has been enacted in each state it is advantageous because no further authorization is necessary and it is uniform across states. Moreover, the compact is relatively stable--unlike the statutes authorizing interstate sharing or not-for-profit organizations, the interstate compact is not often reviewed or amended by the legislature.

(3) Incorporation Under a Not-for-Profit Law. A third method of handling interstate sharing is to incorporate the facility under the Not-for-Profit Law of one of the states. Incorporation is a legal process by which members can create an independent and separate organization. A not-for-profit

Exhibit 1

INTERSTATE COMMUNICATIONS SHARING



corporation differs from other business corporations in two ways. First, it is usually a private venture designed to perform educational, charitable, or community service functions. Secondly, while it can charge prices for its services and reinvest any surplus in the corporation, it cannot distribute surplus funds (profits) to its members.

One advantage of incorporation is that the members are not financially responsible for the liabilities of the corporation; for example, if the corporation is sued, the members cannot be forced to pay the court judgment. Of greater importance is the fact that through incorporation members do not need legislative authorization in each state to establish an interstate joint communications system. Once the corporation is established under the Not-for-Profit Law of one state, it is free to do business in other states.

The disadvantages of not-for-profit incorporation are potentially severe. The newly created corporation would be a non-governmental agency, which could cause problems with initial funding: the jurisdictions participating in the system may have no legal basis for making appropriations, grants, or assessments to a non-governmental agency. Communications center staff would be affected as they would no longer be governmental employees, which could raise issues of wages and benefits. Aside from contracting for service from the new corporation, it is not clear to what extent the consuming agencies can participate in the operation and management of the corporation. Finally, a not-for-profit corporation is subject to any changes in the Not-for-Profit Law, as well as changes in administrative rules and regulations governing not-for-profit corporations. The effect of such changes on a police communications corporation is not foreseeable.* For these reasons, not-for-profit incorporation is not recommended.

---

*U.S. Department of Justice, National Institute of Law Enforcement and Criminal Justice, Illinois Police Communications Study, Phase Two, by Associated Public-Safety Communications Officers, Inc. (New Smyrna Beach, Florida, December 1969), see generally, pp. 6-8; Appendix pp. iii - v.

APPENDIX E

SAMPLE ANNOTATED CONTRACT

SAMPLE ANNOTATED CONTRACT*

NATURE OF THE AGREEMENT: The contract should identify the parties involved and their legal relationship, describe the nature of the service and explain the need for entering into the agreement. Any definition of terms should be in this opening section of the agreement.

WORK TO BE PERFORMED: All contracts should state, as specifically as possible, the level of service to be provided or the nature of the work to be performed. . . . [T]he contract should include a detailed statement of the activities to be undertaken, equipment to be used, standards to be met, and other service-related matters. . . .

LIMITATIONS: The contract should spell out precisely any limitations or restrictions imposed by either party on delivery of the service; for example, the extent to which contracting parties share liability for damages or injuries to persons or property. When contract performance is conditional upon receipt of a grant subsidy, the party supplying the money can be protected by a clause relieving that party from further payment, performance, or liability for damages should the grant or subsidy fail to materialize. Such a clause also relieves a producer from service delivery obligations.

SERVICE CHARGES: The contract should specify the items covered in the total cost. It should specify, if applicable, salaries, depreciation on machinery and equipment, travel expense, overhead, office supplies, clerical work, fringe benefits to employees, capital expenditures, and the like. The cost development worksheet should be kept with the contract file. The recipient government contracting for a service will be responsible for payment. Service charges may be based on factors such as a flat rate (hourly, monthly, or yearly), percentage of assessed valuation, actual "out-of-pocket" expenditure, size of population served, unit/cost measures, or a combination of these and other factors.

ADMINISTRATION: The contract should clearly identify the agency or agencies performing the service and the office responsible for its administration. There should be specific mention of the office representing each party to whom notices and communications are to be sent. The contract should also stipulate that the provider government retains control over and maintains service records of its officers and agency employees.

FISCAL PROCEDURES: The contract should require the maintenance of accurate records, the issuance of financial reports, and the stipulation of how, when, and to whom payments are to be made. Each government should be required to make appropriate books and records available for inspection and audit by the officers and agents of the other government. Provisions requiring periodic review and adjustment of rates or charges should be included. . . .

*The information contained in this exhibit on contracts is based primarily on research of the National Association of Counties Research Foundation, plus information from three main sources: Handbook for Interlocal Agreements and Contracts (Advisory Commission on Intergovernmental Relations), and Intergovernmental Cooperation in Illinois, as printed in U.S. Department of Housing and Urban Development, Office of Policy Development and Research, Interlocal Service Delivery: A Practical Guide to Intergovernmental Agreements/Contracts for Local Officials, by National Association of Counties Research Foundation (Washington, D.C.: U.S. Government Printing Office, 1977), p.4.

(continues)

(concluded)

PERSONNEL RIGHTS: Contractual provisions should be included to address the status, civil-service rights, privileges and immunities, and fringe benefits of . . . employees. . . . The staffing procedures for employees . . . may be included in this provision.

PROPERTY MANAGEMENT: The contract should spell out property arrangements. For example, a county sheriff may contract to provide patrol services to a jurisdiction that owns several patrol cars. Responsibility for maintenance of facilities and equipment must be clearly assigned to the county or the contracting jurisdiction. Property disposition at the end of the contract should also be determined.

DURATION, TERMINATION, AND AMENDMENT. The interlocal contract should state the duration of the agreement, the circumstances under which participants may withdraw, and procedures for amending the contract. Contracts may also be written for an indefinite period, to be ended only when one government notifies the other that it wants to withdraw from the agreement. All contracts should require written notification for withdrawal and indicate time parameters. There should be a brief description of arbitration or other ways, short of litigation, for resolving questions of contract interpretation. Termination of an agreement may result from the failure of one party to make payment or to meet contract obligations. Procedures for periodic contract amendment are needed to keep an agreement up to date with changing cost factors and service levels.

MONITORING AND EVALUATION: Provisions should be made for continuous monitoring and evaluation of the contract by both the recipient and provider units of government. Such activities could be included as part of the contract or conducted on an informal basis. Continuous monitoring and evaluation by both the provider and recipient lessen the chance for misinterpretation of the contract and provide a means of immediately addressing any differences that may arise.

APPENDIX F

MODEL JOINT POWERS AGREEMENT*

*This agreement was developed and published by the Association of Centralized Communications Directors and appears in Planning Guide for Consolidated Communications Centers, by the Telecommunications Management Committee, (Wheaton, Illinois: Association of Centralized Communications Directors).

AN AGREEMENT TO PROVIDE

JOINT PUBLIC SAFETY TELECOMMUNICATIONS SERVICE

This agreement is made and entered into this ____ day of _____, _____, by the (legally named participants).

1. Parties. The (named governmental units) mentioned in this Agreement are units of government organized and existing under the authority of the statutes of the state of _____ (chapter and section). Each unit of government (or fire protection district, ambulance service, rescue unit, etc.) mentioned in this Agreement shall be designated by name (e.g., City of _____ _____) if independently referred to or referred to by the collective name of (consolidated communications system name) to indicate reference to collective action by all signatory parties to this Agreement.

2. Purpose. The purpose of this Agreement is to unite the parties in a cooperative (or consolidated) arrangement to provide communications services for (police, fire, ambulance, as applicable) and other emergency functions within the areas serviced by the signators to this Agreement or within that area agreed to be served by the signators.

3. Name. For convenient reference, the name by which this arrangement shall be known is (name of the communications venture), and this Agreement may hereinafter and in other legal documents be referred to as the (name of venture) Agreement.

4. Legal Basis. This Agreement is executed pursuant to the provisions of (the applicable state statute) which provides and authorizes joint exercise by two or more units of local government of any power common to them. It is the intention of the parties to exercise to the fullest extent possible, as permitted by law, the authority granted to them by those statutory provisions.

5. Term of Agreement. This Agreement shall be in effect for the signators for a period of (number of years). Thereafter it shall automatically be renewed with no affirmative action by the parties for successive annual periods commencing (month) of each year until notice of termination is given as provided elsewhere in this Agreement. Those other signators to the (name of the Agreement) shall be bound by the time limits as specifically set forth in this paragraph unless otherwise agreed to in writing.

6. By-Laws. (Name of Venture) shall be subject to and shall be governed by certain By-Laws, a copy of which is attached hereto as Exhibit "A" and by this reference made a part of this Agreement, together with any amendments which may be made to said By-Laws in the manner and means therein set forth.

7. Participatory Obligations. Each signator to this Agreement (and such future signators as may be approved by these signators and subject to the By-Laws) is a member of (name of venture) and is entitled to the rights and privileges and is subject to the obligations of membership, all as provided by in said By-Laws.

8. Termination. Any party to this Agreement may cease to be a party hereto and may withdraw from participation in (name of venture) in the manner and means as set forth in the By-Laws.

9. Powers of the System. (Name of venture) shall have the power in its own name, to make and enter into contracts, to employ agents and employees, to acquire, hold, and dispose of property, real and personal, and to incur debts, liabilities or obligations necessary for the accomplishment of its purposes, but no such contract, employment, purchase, debt, liability, or obligation shall be binding upon or obligate any member except as authorized by the attached By-Laws. (Name of Venture) shall not have the power to eminent domain or the power to levy taxes. (Name of Venture) is established with the intention that it is a "not for profit" organization.

10. Amendment. This Agreement may not be amended, except by written Agreement and resolution of all of the then parties to it, provided, however, the By-Laws attached hereto as Exhibit "A" may be amended from time to time by the method and means provided herein.

11. Enforcement. Each member shall have the right to enforce this Agreement against any other member. If suit is necessary therefor, a defaulting member shall pay reasonable attorney's fees to (name of venture) as adjudicated by the court.

12. Authorization. Prior to the individual execution of this Agreement, each signatory member shall deliver to the other a certified copy of a suitable ordinance or resolution authorizing and directing the execution of this Agreement.

13. Severability. If any part of this Agreement is adjudged invalid, such adjudication shall not affect the validity of the Agreement as a whole or of any other part.

IN WITNESS WHEREOF, the parties, pursuant to authority granted by resolution or ordinance adopted by each of them, have caused this Agreement to be executed by setting forth their signatures below. This document may be signed in duplicate originals.

_____

Attest:

APPENDIX G

SAMPLE PERFORMANCE APPRAISAL FORM

File Copy _____

Employee Copy _____

SOUTH BAY REGIONAL PUBLIC COMMUNICATIONS AUTHORITY
Communications Operator Performance Evaluation

EMPLOYEE NAME _____ I.D. NUMBER _____

JOB CLASSIFICATION _____ PRESENT SALARY _____

START DATE _____ DUE DATE _____

TIME PERIOD EVALUATED _____

EVALUATION _____ Annual _____ Probationary _____ Promotional

ATTENDANCE RECORD

This employee has been absent due to illness on _____ occasions, for a total of _____ hours. _____ minutes.

This employee has been absent due to other reasons on _____ occasions, for a total of _____ hours. _____ minutes.

This employee has been tardy on _____ occasions, for a total of _____ hours, _____ minutes.

APPRAISAL CRITERIA

OUTSTANDING — Performance consistently above normal standards, characterized by insight, initiative and accomplishment. Frequently anticipates needs; shows consistently good judgement. Rating earned by employees who demonstrate exceptional performance and merit special recognition.

GOOD — Performance above normal standards. Not every employee necessarily qualifies.

SATISFACTORY — Consistently meets expectations. Most employees perform at this level.

MARGINAL — Performance does not usually meet normal standards. Specific deficiencies must be noted under comments. Selection indicates the rater's belief that employee will improve.

UNSATISFACTORY — Performance is not acceptable. Requires explanation. Employee demonstrates inability or unwillingness to improve or meet standards. Can be cause for dismissal.

UNSATISFACTORY	MARGINAL	SATISFACTORY	GOOD	OUTSTANDING			
					SECTION I (General Work Habits)		
					a. Absenteeism	:	reasonableness; timing
					b. Appearance	:	acceptable attire; grooming
					c. Codes	:	knowledge; application
					d. Confidence	:	independence of action
					e. Efficiency	:	accuracy/speed of data entry
					f. Equipment	:	use/care; includes work area
					g. Polish	:	interaction with public/city personnel
					h. Professionalism	:	tact; discretion; confidentiality
					i. Punctuality	:	on-time work reporting
					j. Reliability	:	follows directions, work rules
					k. Responsibility	:	accepts effectively
					l. Stress	:	manages work under pressure
					m. Teamwork	:	interaction with others
					SECTION II (Telephone Call Processing)		
					a. Codes	:	priorities, actions, early entry
					b. Control	:	dominance of conversation
					c. Product	:	composition/text of call
					d. Questioning	:	screening, efficiency
					SECTION III (Radio Dispatching)		
					a. Changes	:	maintenance of equipment status
					b. Traffic	:	comprehension; control
					c. Voice	:	clarity; diction; forcefulness

OVERALL PERFORMANCE EVALUATION

☐ OUTSTANDING	Performance is exceptional and always exceeds requirements of the job.
☐ GOOD	Performance exceeds requirements of job in many respects.
☐ SATISFACTORY	Performance usually meets requirements of the job.
☐ MARGINAL	Performance does not meet normal standards.
☐ UNSATISFACTORY	Performance is unacceptable and does not meet requirements of the job.

COMPLETE THIS SECTION FOR ALL EMPLOYEES:

PERFORMANCE STRENGTHS:

PERFORMANCE WEAKNESSES:

AREA(S) FOR FUTURE IMPROVEMENT:

SUPERVISOR'S COMMENTS:

EMPLOYEE'S COMMENTS:

DIVISION/SECTION CHIEF'S COMMENTS, IF ANY:

CERTIFICATION SECTION

CERTIFICATION BY SUPERVISOR:
I hereby certify that this evaluation constitutes my best judgement of the performance of this employee and is based on my personal observation for a period of _____ (months/years).

SUPERVISORS'S SIGNATURE DATE

CERTIFICATION BY EMPLOYEE:
I hereby certify that this evaluation has been reviewed with me and I clearly understand that my signature does not imply agreement or disagreement with the conclusion of the supervisor.

EMPLOYEE'S SIGNATURE DATE

CERTIFICATION BY DIVISION/SECTION CHIEF:
I hereby certify that I have reviewed this evaluation as completed by the above-named supervisor.

DIVISION/SECTION CHIEF'S SIGNATURE DATE

CERTIFICATION BY EXECUTIVE DIRECTOR:
I hereby certify that I have reviewed this evaluation as completed by the above-named supervisor.

EXECUTIVE DIRECTOR'S SIGNATURE DATE

END