

# MASS TRANSIT MANAGEMENT:

A HANDBOOK FOR SMALL CITIES

SECOND EDITION, REVISED

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U.S. DEPARTMENT OF TRANSPORTATION  
URBAN MASS TRANSPORTATION ADMINISTRATION  
OFFICE OF THE SECRETARY

PART II









# **MASS TRANSIT MANAGEMENT:**

## **A HANDBOOK FOR SMALL CITIES**

Volume 2: Management and Control



**REVISED EDITION**

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## INTRODUCTION TO THE SECOND EDITION, REVISED

In most fields of transportation, management--rather than equipment, location, or operating rights--is the key to success. Urban mass transportation is no exception. Despite its importance, transit management has received surprisingly little attention, especially in terms of modern business practices. The aim of this handbook is to provide information for the management of mass transit, particularly for small-scale operations in smaller cities in the United States. For the purposes of this handbook, a small city is defined as one that operates 101 buses or fewer. This cutoff point for small transit systems is one used by the federal government. Because of the scale of transit enterprises involved, the handbook assumes that management faces two major constraints: (1) the amount of money available and (2) the degree of specialization possible with the limited manpower of a small enterprise.

Staff members at the Institute for Urban Transportation (IUT) in Bloomington, Indiana, investigated the practices of smaller transit systems in many parts of the United States to discover firsthand some of the methods and problems of such properties. The best methods used by these properties have been included in this handbook. In addition, a modern, systematic approach to the management of transit firms has been worked into the material as an improvement on the conventional practices of the transit industry. Extensive experience in providing local and statewide technical assistance in Indiana and conducting management performance audits of transit properties has provided IUT's staff with substantial insight into transit management.

The modern consumer-oriented approach to business is strongly emphasized in this handbook. The consumer-oriented approach is the major concept of business that has been pursued through the technique of marketing management by American business firms since the end of World War II. By adopting this powerful, strategic concept, this handbook is very much a marketing-oriented document. The justifications for this approach seem compelling because in general the transit industry admittedly suffers from a lack of marketing expertise and effort. Today, the transit industry still is primarily operations-oriented. However, in many parts of the United States transit properties of all sizes are becoming more marketing-oriented.

The handbook is divided into four sections. Part I: Goals, Support, and Finance (chapters 1-3) includes the important matters of establishing goals and objectives, understanding the consumer, gaining public support and public action for transit, institutionalizing transit as an integral part of the community, and financing transit. Part II: Management and Control (chapters 4 and 5) focuses on management itself and the control and information devices needed for effective management. Part III: Operations (chapters 6-10) covers important areas of day-to-day operation, coordinated as the product element in the marketing mix. Part IV: Marketing (chapters 11-14) deals with the marketing program and promotional activities.

Because this handbook is intended to serve as a reference work, not a textbook, care has been taken to produce chapters that are complete in and of themselves, which can be used independently. Some repetition is inevitable when using this technique, but every effort has been made to eliminate duplication as much as possible by cross-referencing and through providing a detailed table of contents. Appendixes are included with some chapters to give more detail on certain subjects without interrupting the flow of the text. A short but relevant bibliography is provided at the end of each chapter. A general bibliography is included at the end of the handbook.

Early in this handbook, the need to establish goals and objectives is stressed. Indeed, the concept of management by objectives (MBO) is treated in some detail. MBO recommendations are given for policy-making bodies as well as management. A detailed explanation of how to use MBO for transit management is provided.

The critical concept of consumer orientation through marketing is reflected throughout the handbook, but perhaps most strongly in Chapter 1 and Chapter 11. Chapter 1 is a discussion of the goals and objectives of a transit enterprise. It covers consumer behavior as it may be applied to mass transportation and a recommendation for the development of a general marketing-management strategy for transit management. In Chapter 11, the marketing program suggested for the small transit property is developed fully. The relationship of all parts of the transit enterprise is built around a marketing-oriented firm. The marketing mix--product, price, and promotion--is the concept that shapes managerial action in meeting consumer needs. MBO is the means by which results can be attained reasonably.

Throughout this handbook, careful attention has been paid to the consumer and to gearing management thought and the service provided by the transit firm to meet the desires and needs of consumers. Service quality is a key factor--not a minimum of service at the lowest possible

cost, concocted mainly to meet the needs of the transit firm, but service that meets consumer needs and desires at a cost carefully calculated and controlled. This seems a wise course for transit managers; publicly owned transit firms--of which the number is increasing rapidly--generally focus on service as their main reason for operation. Even privately owned transit firms cannot hope to generate long-run profits without providing good service to their clientele.

In addition to covering broad strategic concepts of management and matters of systematic, day-to-day operation, this handbook deals with critical factors including public support, finance, and various forms of public ownership. A fair proportion of the contents, therefore, is directed not only toward transit managers, but also toward public-spirited citizens and public officials who wish to inaugurate or improve transit services through public action.

This handbook should be considered a draft, as was the first edition. It combines the tried-and-true methods--where these appeared to be the best possible practices--with innovation, in the application of modern business techniques to transit. Thus, this handbook ventures onto untested ground. In a world of managerial as well as technical innovation, it would be surprising indeed if no major changes in modern business thinking and in transit occur in the course of 3 to 5 years. What is contained here may be subject to fairly rapid obsolescence.

We sincerely hope that by using this handbook managers of existing smaller transit properties will find many good ideas and suggestions that they may adopt easily. For the transit operation starting from scratch, this handbook provides as complete and usable a program as currently is available in published form. To be completely realistic, existing transit properties will be able to adopt the complete strategy and the major concepts suggested here only with some difficulty, because of vested interests, agreements, and other factors difficult or impossible to modify in a short time.



## PART II

### MANAGEMENT AND CONTROL

The consumer-oriented concept of management depends upon skilled management, armed with the necessary information to take wise action. Therefore, Chapter 4 focuses on the functions and problems of transit management and the important issue of information needed for managerial control of an enterprise. As far as management is concerned, guidelines are provided to help managers of smaller properties avoid some of the pitfalls that can make a small enterprise more difficult to operate than a large one. Guidelines also are provided for the selection of management talent. In both cases, the guidelines are based on standard, modern business management concepts, adapted to fit the small-scale transit management situation.

Chapter 5 provides a detailed treatment of inexpensive, yet complete methods of gathering statistical data that management must have to run an enterprise effectively. In systems dominated by the marketing concept, the information element is highly important because each element of the firm is tied to the others through a network of information. Some of this is basic accounting information, but, of course, other types of data are needed to help management in reaching decisions. For the small enterprise, the information systems developed are low in cost and easy to handle with few highly skilled personnel. This chapter also covers section 15 reporting requirements necessary for those receiving section 5 aid from UMTA.



## CHAPTER 4

### THE TRANSIT MANAGEMENT PROGRAM: FUNCTIONS, MANAGEMENT BY OBJECTIVES, AND ORGANIZATION AND PLANNING

#### Introduction

This chapter sets out the basic principles of management needed to guide a transit enterprise. It takes its theme for overall strategy from the principles laid out in Chapter 1. As always, the most modern concepts of business management are introduced and adapted to mass transportation.

The chapter starts with a review of the environment in which transit management exists. The concept of management by objectives (MBO) is then introduced and fully developed for the transit setting. The concepts of managerial planning and organization are then discussed, and suggestions are made for organizational forms that may be useful for transit. At the end of the chapter there are suggestions for ways to find managerial personnel.

#### The Environment of Transit

Accepting the fact that transit management cannot affect certain factors to improve transit, what are the principal elements that are under management's control? This control is important in determining what managerial form will be adopted, as well as in determining the best organization for a transit firm.

The management of a transit firm, regardless of size, operates within several environments. One is the national environment; another is the state and local environment. Finally, there is the internal environment of the transit firm itself (see Figure 4.1).

#### National Environment

The national environment of transit is shaped largely by federal laws, policy, and regulations that affect

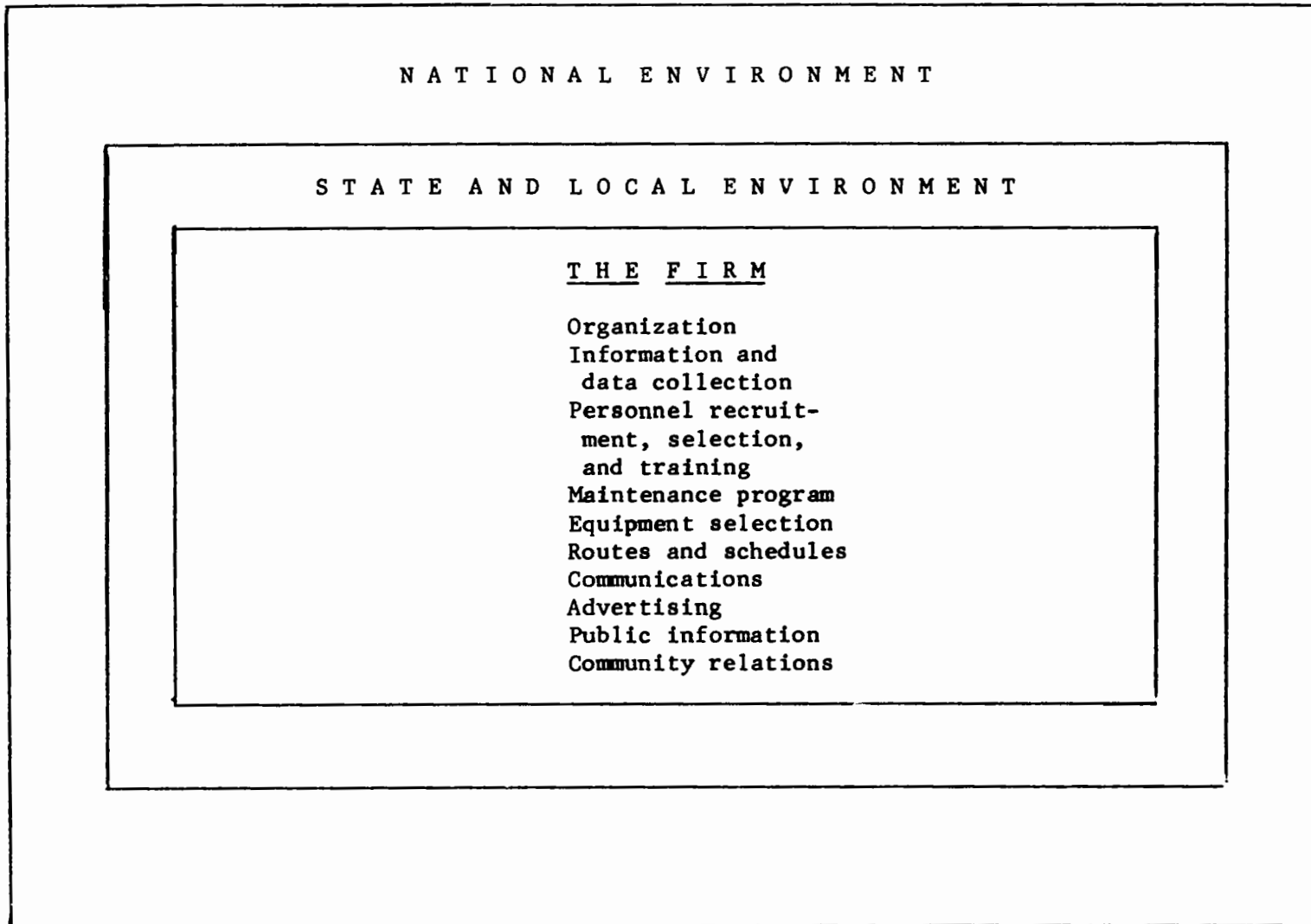


FIGURE 4.1 The environment of transit management.



transit. The tone of the general economy also may have an impact on the environment of transit. A healthy economy generates more tax revenue to be used in support of federal transit programs; a slack economy may need bolstering by federal capital projects, such as a large transit capital investment. Also important are factors affecting transit that are associated with national problems. One example is the energy problem that was brought to the nation's attention as a result of the 1973-1974 oil embargo. Ecological concerns and what to do about them also may have an impact on transit.

The development of a realistic national urban policy can have a vital impact on transit should the federal government attempt to undertake a general renewal and refurbishment of the nation's cities. Social and other viewpoints also are important factors on the national scene. The potential role that transit can play in helping to solve national problems may create a positive attitude on the part of the federal government. Likewise, a positive national attitude toward transit may have a positive impact on state and local viewpoints. A generally positive attitude toward transit, engendered by government policy or even by the popular media, can benefit the transit industry enormously.

Although the influence of the individual transit manager is apt to be relatively small on a national level, he can work with his state's congressmen to see that his views are made known on legislative matters. Also, working through the American Public Transit Association (APTA), managers can join together to influence national policy and the national environment for transit.

### State and Local Environments

Critical elements at the state and local levels include state and local policy, programs, regulations, and the general economy of the state. These elements are translated into state and local financial support. Perhaps even more important to local transit management are the state and local attitudes toward transit. Is transit perceived as a good thing or merely another type of welfare? These attitudes may be shaped by state or local public officials or by the media. It is critical to the fortunes of transit that there be an attitude supportive of transit, for this will determine whether transit will get the money and legislative powers it requires to serve the public. On all levels, the way transit is perceived will affect support and play an important role in how good a job management can do.

The local manager can work to influence the state environment through the elected and appointed officials of the state government and through local members of the state legislature. A strong and unified state public transit

organization also can provide a means for local management to have an impact on the state transit environment.

Locally, the environment can be affected by working with local elected and appointed officials, the transit authority (if that is the means by which local transit service is delivered), and with planning officials. Through community relations efforts and by giving good service, the local environment also may be affected (see Chapter 14). On all levels, local management may affect the environment through support of various public interest groups sympathetic to the transit cause.

### Internal Environment

Within the transit entity itself, management should have considerable control over major factors of what may be done and how it may be accomplished. There are 11 variables that management can mold to provide good transit service. It is essential that management understand the full spectrum of variables under its control. These variables are:

1. The goals and objectives of the transit agency and the organization necessary to meet those goals.
2. The information collected by the firm and its use for management purposes. This includes accounting information as well as other facts necessary for control and decision making.
3. Personnel recruitment, selection, and training programs.
4. The maintenance program.
5. The equipment selected.
6. Bus routes and schedules.
7. Supervision and communications.
8. The marketing program.
9. The advertising program.
10. The public information program.
11. Community relations.

Each of these elements will be discussed in subsequent chapters, for they are the necessary components of transit management.

## The Art of Management

There always has been discussion about whether management is mainly an art or a science. Although there are many fairly scientific elements, there also is much art in management. Some useful managerial traits can be learned, and there are approaches to management--some noted in this handbook--that can help anyone to be a better manager. Managerial effectiveness, however, depends upon qualities of leadership found in individual managers or in a managerial team. Effectiveness also is related closely to personality and the ability to deal with other people in a harmonious and mutually satisfying fashion. Because it often is a matter of the chemistry of interaction, the true essence of management is elusive.

### Management Roles

When asked what managers do, many persons will cite the familiar textbook definition of the planning, organizing, motivating, and controlling tasks that usually are outlined as the jobs of a manager. However, if one looks at what a manager really does, the roles of leader, information processor, and strategy maker are more evident than the more formal textbook definitions. Although the manager fills all of these roles, often they are not distinct.

Managers have the essential task of coordinating and controlling the use of resources devoted to mass transportation. It is here that they will play all the various roles defined below. The coordination and control of resources require careful planning. This includes the setting of goals and objectives, budgeting the funds that will be needed to achieve the goals and objectives, and evaluating the results of the operation.

Leader. The art of management can be seen in the roles a manager plays in an enterprise. The first role is that of leader, which is decreed by the formal authority and given to various persons within the management hierarchy. The leader is a figurehead, either over the entire transit operation or parts of it, as a result of formal authority. Status of this kind allows the persons possessing it to be activators, the initiators of ideas and efforts. The role of leader also confers upon an individual the position of contact person. One's formal authority is a natural clue to others as to who might be contacted for information or action for a given situation or problem.

Information processor. The second major role of a manager is that of information processor. The manager acts as a nerve center for information and communication, both internal and external. The manager in his information

processing role acts as a spokesman, as an expert, and as a disseminator of information. The manager also determines the value of information and decides who needs to share the information.

Strategy maker. As strategy maker, the manager allocates resources, parceling out material resources and delegating authority. In this role the manager also becomes the crisis handler. He is a bargainer, handling problems and mediating the difficulties between people. The manager also acts as an entrepreneur, initiating projects and schemes that are necessary within an organization to keep it vital. This role helps to promote the longevity of an organization by moving it into new areas or by diversifying its approach to existing business.

### Managerial Styles

The overall managerial style for achieving coordination and control is extremely important.

Reactive. Some managers are reactive in style; they react to problems and spend most of their time putting out fires. Such a manager is really never in control of the situation. Faced with the myriad of problems that have beset mass transportation in the past three decades, transit management has been largely reactive in nature. As strictly a reactor to problems, management soon becomes overwhelmed by them.

Proactive. Another form of management style is the proactive style. The proactive manager aims at meeting defined goals and established, workable objectives. With a firm idea of where the enterprise is headed and a means to reach it carefully mapped out, management is in full control of the situation.

Obviously, the proactive style of management is the most attractive. In order to become a proactive manager and to adopt this style, not only as an individual but for the overall transit undertaking, the adoption of the concept and technique of management by objectives (MBO) is essential.

### Management by Objectives

To carry out a proactive, MBO program, the manager must prepare the following tasks in a logical and organized manner:

1. A list of programs, objectives, tasks, priorities, and so forth that are to be accomplished.
2. Plans, timetables, and target dates for completion.

3. Delegation of responsibility for fulfillment of the objectives.

To carry out an MBO program, the manager must develop a strategy with the following six essential and interrelated elements:

1. Goals.
2. Objectives.
3. Plans.
4. Managerial direction and action.
5. Control.
6. Feedback.

### Goals

The starting place in MBO is establishing goals. Goals may be defined as broad-scoped conditions that by their very nature cannot be associated with any single improvement or modification. A goal is a long-run condition considered to be an ideal or a model situation. A number of objectives will have to be set, and many actions will be necessary in most instances in order to achieve any one of the goals.

Some examples of goals for mass transit will be instructive. The following list is an example of goals that may be found for the federal transit programs as well as many state and local transit programs:

1. Provide mobility for all persons.
2. Improve the environment by increasing energy efficiency, fostering rational land use, and minimizing air, water, and noise pollution.
3. Sustain and enhance economic growth and vitality in the community.
4. Provide the highest feasible and practicable level of safety for people, goods, and the environment.
5. Provide for an efficient and cost-effective transportation system.

It should be noted from the above list of goals that transit alone cannot achieve them. For example, sustaining and enhancing economic growth and vitality in a given community may be achieved only in part by an improvement or expansion in the quality and quantity of mass transportation service. Local tax policy and the provision of various local services such as police and fire protection, water and sewer supply, and quality educational and recreational facilities also belong to the spectrum of activities that must exist to sustain and enhance economic growth in a community. In establishing goals, the manager should not be led astray with the idea that transit by itself can achieve all of the goals that may be considered essential in a community. It also must be recognized that, in working with other community efforts, transit not only helps achieve community goals but also improves its own position, aiding the process of institutionalizing transit in a community (see Chapter 2).

### Objectives

Objectives are more precise than goals; they must be specific to a given point. Objectives define a condition more specifically than goals do because they are the means by which goals can be achieved. Objectives must be:

1. Clear, concise, and unambiguous statements of what is to be accomplished.
2. Measurable and attainable in a reasonable period of time and with reasonable effort.
3. Consistent with goals and priorities.
4. Assigned a date of accomplishment.
5. Specific about who is responsible for accomplishing the objectives.

Once the principal objectives have been successfully established, it is critical that all of the personnel in an organization be involved in the establishment of the more detailed objectives and action plans needed for MBO. Indeed, the idea of working together to formulate the objectives is an integral part of the MBO process. The role of the board of directors and top management is to help define the goals of an organization. Top management's job is to set out the major objectives. Lower level managers must act under the MBO concept to set their own objectives, based on the overall goals and objectives for the entire enterprise.

A crucial part of MBO is that specific objectives for given areas are not to be imposed from above but set by those close to the working level. By involving the people who are at the operating level in the development of objectives, their support can be expected to be much more enthusiastic. It also is important that people set the benchmarks by which they will be evaluated by their superiors. It is expected that people will be much more cooperative if they are involved in the process of deciding what they will do and how they will be evaluated in doing it.

The job of top management in an enterprise using MBO is to coordinate the effort made throughout the organization toward the overall goals and objectives of the enterprise. Thus, an organization that is conducted by the MBO process not only has a clear idea of where it is going, but it should have the full cooperation of all the people within it because they have been involved in mapping out the course of action.

### Plan

Before embarking on the development of an action plan or plans to be carried out by the MBO process, it is wise to inventory the situation to assess the strengths and weaknesses of the transit enterprise. Figures 4.2, 4.3, and 4.4 are examples of inventory sheets that can be used in determining the strengths and weaknesses of an organization. Figure 4.2 is an example of an inventory of transit operations. This format would enable managers to get a better idea of how their transit system actually stacks up, rather than relying on unstructured speculation. Figure 4.3 and 4.4 simply take two of several detailed underlying parts of the organization and provide examples of how to review these parts in more detail.

After the situation is fully inventoried, the model action plan as shown in Figure 4.5 then sets out the major steps and action that will be taken. The example shown is based on a series of objectives to improve service reliability by a given amount and by a given time. The form is largely self-explanatory; please note that it is divided into actions to determine the extent of the problem, actions to analyze the problem, and actions to resolve the problem. In the first category, assuming consumers believe service is unreliable, the first step is to determine exactly how unreliable it is. Service, in fact, may be unreliable and require corrective action but, with research into consumer attitudes, it may be found that the perception of reliability that the consumers have is mistaken and that corrective action should be taken in some other area.

TRANSIT OPERATIONS

<u>1. Are your revenue vehicles appropriate to</u>	<u>YES</u>	<u>NO</u>	<u>N.A.</u>	<u>COMMENTS</u>
<u>your operation in terms of:</u>				
-their general appearance? .....	___	___	___	
-their signing for proper identification?.....	___	___	___	
-their cleanliness, both exterior and interior?	___	___	___	
<u>2. Are your routes characterized by:</u>				
-high reliability in operation?.....	___	___	___	
-directness of service?.....	___	___	___	
-appropriately placed bus stop signs, benches and shelters?.....	___	___	___	
-adequate service to all major generators?.....	___	___	___	
<u>3. Does your transit system have any driver</u>				
<u>personnel practices for the following:</u>				
-selection criteria?.....	___	___	___	
-training program--both classroom & on-the- road?.....	___	___	___	
-morale boosting activities?.....	___	___	___	
<u>4. Do you have written operating policies</u>				
<u>for the following:</u>				
-fares and transfers?.....	___	___	___	
-accident reporting?.....	___	___	___	
-defect reporting?.....	___	___	___	
-passenger counting?.....	___	___	___	
-smoking?.....	___	___	___	

FIGURE 4.2 Inventory example--transit operations.



- change-making?..... — — —
- absenteeism and tardiness?..... — — —
- 5. What do your supervisory personnel do?
- maintain and monitor radio contact?..... — — —
- provide on-the-road supervision?..... — — —
- dispatch and schedule?..... — — —
- monitor money handling?..... — — —
- monitor miscellaneous record-keeping  
(driver records, train delays, etc.)..... — — —
- hire, discipline, and fire drivers?..... — — —
- 6. Does your system routinely report on performance by making the appropriate comparisons of ridership--both system-wide and by routes?
- daily?..... — — —
- weekly?..... — — —
- monthly?..... — — —
- yearly?..... — — —

N.A. = Not appropriate for size of transit system

FIGURE 4.2 Continued.

MAINTENANCE OPERATIONS

1. <u>Is your maintenance facility adequate for present operations and where you expect to be in one year, in terms of number and quality of the following:</u>	<u>YES</u>	<u>NO</u>	<u>N.A.</u>	<u>COMMENTS</u>
-work bays?.....	---	---	---	
-lifts or pits?.....	---	---	---	
-storerooms?.....	---	---	---	
-automatic bus washers or ability to hand wash indoors?.....	---	---	---	
-maintenance supervisor's office?.....	---	---	---	
-paint and body work shop?.....	---	---	---	
2. <u>Is your maintenance equipment appropriate to the size of your transit operation, in terms of the kinds and numbers of the following:</u>				
-mechanics tools?.....	---	---	---	
-specialized equipment (wheel balancers, etc.)?	---	---	---	
3. <u>Do you have a complete inventory of spare parts necessary to sustain a preventive maintenance program and normal equipment failures:</u>				
-miscellaneous vehicle parts (side view mirrors, etc.)?.....	---	---	---	
-engine parts (fan belts, distributors, etc.)?	---	---	---	
-engine replacements?.....	---	---	---	

FIGURE 4.3 Inventory example--maintenance.

4. Do you have the following maintenance personnel programs?
- mechanic selection criteria?.....
  - on-the-job mechanic training?.....
  - to increase employee morale?.....
5. Does your preventive maintenance program outline procedures for regular vehicle inspection and major overhauls with regard to timing according to a schedule?
- daily inspection?.....
  - weekly inspection?.....
  - monthly inspection?.....
  - schedule of major overhauls?.....
6. Do you have the following:
- repair time standards?.....
  - work orders?.....
  - individual vehicle recordkeeping?.....
  - inventory control and restocking?.....
7. Does vehicle care consist of:
- daily washing?.....
  - daily fueling, oil check and water level check?
  - daily interior cleaning, including windows?...
  - weekly major interior cleaning?.....

FIGURE 4.3 Continued.

MARKETING

1. <u>Do you have a comprehensive marketing program</u>	<u>YES</u>	<u>NO</u>	<u>N.A.</u>	<u>COMMENTS</u>
<u>characterized by:</u>				
-marketing staff person, full-time/part-time?..	___	___	___	
-a marketing plan with goals, objectives, and dates of accomplishment?.....	___	___	___	
-a marketing budget for research and promotion?	___	___	___	
2. <u>Does your system offer any promotional fares for:</u>				
-elderly and handicapped?.....	___	___	___	
-multiple use discounts (passes)?.....	___	___	___	
-off-peak discount fares?.....	___	___	___	
-students or young people?.....	___	___	___	
3. <u>Does your system have a plan for service</u>				
<u>development consisting of:</u>				
-system reliability checks?.....	___	___	___	
-analysis of utilization of vehicle capacity?..	___	___	___	
-regular program to obtain marketing informa- tion from users and potential users?.....	___	___	___	
-regular route and schedule review?.....	___	___	___	
-identification of potential special service needs of the community?.....	___	___	___	
4. <u>Does your system have a promotion plan</u>				
<u>consisting of:</u>				
-advertising program and plan based on analysis of target markets?.....	___	___	___	

FIGURE 4.4 Inventory example--marketing.

	<u>YES</u>	<u>NO</u>	<u>N.A.</u>	<u>COMMENTS</u>
-community relations program (presentations to social service agencies, schools, etc.)?....	___	___	___	
-special promotions with businesses (nickel days, etc.)?.....	___	___	___	
-exchange or contributed advertising (T.V. and radio stations, etc.)?.....	___	___	___	
-public relations (i.e. news releases)?.....	___	___	___	
-route and schedule telephone information?....	___	___	___	
-printed schedules and route maps?.....	___	___	___	
-transit service designations: bus stops, signs, route maps, posted schedules?.....	___	___	___	
-miscellaneous user information aids--monthly and annual reports to riders and community?.	___	___	___	
-regular vehicle cleaning, bus stop signs, benches, and shelters, etc. for proper system hygenics?.....	___	___	___	
-employee-customers relation training program?	___	___	___	

FIGURE 4.4 Continued.

ACTION PLAN

<u>Target Date</u> <u>For Completion</u>		<u>Operational</u> <u>Responsibility</u>
	I. Actions to Determine Extent of the Problem:	
1-77	A. Spot-check major generator or terminal points and notes number of late or early arrivals.	on-the-road supervisors
	II. Actions to Analyze the Problem:	
2-77	A. Route running times are clocked against scheduled running times by route segment noting running difficulties.	supervisors
2-77	B. Drivers are surveyed as to each route's characteristics in regard to running time.	supervisors
3-77	C. Conclusions reached.	operations manager
	III. Internal Actions to Resolve the Problem:	
_____	A. Place bus stop signs along routes.	_____
_____	B. Begin customer information program to encourage use of bus stops, exact change, rear exit.	_____
_____	C. Impose exact fare policy.	_____

FIGURE 4.5 Model Action Plan.

<u>Target Date</u> <u>For Completion</u>		<u>Operational</u> <u>Responsibility</u>
_____	D. Continue on-the-road supervision.	_____
_____	E. Begin driver training program emphasizing the importance of reliability.	_____
_____	F. Continue on a quarterly basis the analysis of route running times for adherence to schedules.	_____
IV. External Actions to Resolve the Problem:		
_____	A. Obtain reserved bus lanes on critical thoroughfares.	_____
_____	B. Obtain signal preemption rights for buses at key intersections.	_____

FIGURE 4.5 Continued.

Actions to analyze the problem of service reliability might include a survey of drivers to better understand route characteristics in regard to running time, along with clocking the running times of routes against schedule running times for different route segments at different times of day. Actions that might be taken to resolve the problem are set out. A variety of activities are involved including those things that can be done by the transit agency itself--internal actions--and those things that will take external action. For example, if one reason for lack of reliable running time is excess time spent at stops, one action might be to impose an exact fare policy to speed up boarding. It also is possible to revise the schedule. On the other hand, slow running can also be improved by obtaining reserved bus lanes on critical thoroughfares. Such an action would obviously entail action by entities outside the transit agency.

### Control

In the MBO form shown in Figure 4.6, the precise action is presented. The objective and all the priority steps and target dates are set. It is especially important that the MBO form be used as a tool to help think through not only the objective but also the action steps, in the sequence of their priority order.

The format for the operating action plan is shown in Figure 4.7. Such a device is a tool to lay out the basic jobs that must be done and to assign responsibility on a departmental basis. It is intended to be a quick recapitulation and reminder for management--the scene at a glance treatment--not as a replacement for the more detailed approach offered in Figures 4.5 and 4.6. A sheet is prepared for each department or major segment of the organization. Each objective is identified in the left column of the sheet, and across the top lists each month of the year. The last column on the right is used to identify the other departments or segments of the organization that must cooperate in the attainment of the objective. The action steps are then laid out in the columns on a monthly basis.

### Feedback

The aim of these forms is to provide tools by which the MBO process can be carried on. They are not intended to be straitjackets. There are other kinds of forms to obtain the same end. The essential point is that goals and objectives be established and that careful planning be undertaken to assure that those goals and objectives are reached. It is also essential that all members of an organization be involved in the establishment of the objectives and that they help to set the action plans.



"MANAGEMENT BY OBJECTIVES FORM"

OBJECTIVE:

(including the method of measuring achievement, date of accomplishment, and responsible party.)

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ACTION PLAN:

Target Date

for Completion

Priority Steps and Implementation Responsibility

<hr/>	1. <hr/>
<hr/>	<hr/>
<hr/>	2. <hr/>
<hr/>	<hr/>
<hr/>	3. <hr/>
<hr/>	<hr/>
<hr/>	4. <hr/>
<hr/>	<hr/>
<hr/>	5. <hr/>
<hr/>	<hr/>
<hr/>	6. <hr/>
<hr/>	<hr/>

FIGURE 4.6 Management by Objectives Form.

DEPARTMENT: MAINTENANCE

OBJECTIVE	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	SEPT. — DEC.	COORDINATION WITH OTHER DEPARTMENTS
REDUCE ROAD-CALLS TO ONE PER 3,500 MILES		DEVELOP AND IMPLEMENT MONTHLY ROADCALL ANALYSIS REPORT		REVIEW ANALYSIS OF MAJOR CONTRIBUTORS TO ROADCALLS	DEVELOP AND IMPLEMENT CORRECTIVE CAMPAIGN	REVIEW RESULTS OF CAMPAIGN	REDUCTION IN ROAD-CALLS TO STANDARD	REVIEW MONITOR AND MODIFY SYSTEM	OPERATIONS ADMINISTRATION
				ADVANTAGE OF THIS FORMAT IS THAT IT PRESENTS IN A VERY CLEAR FASION NOT ONLY THE OBJECTIVE, BUT ALSO:					
				* STEPS OR ACTION REQUIRED TO ACCOMPLISH THE OBJECTIVE					
				* ENTIRE TIMETABLE INVOLVED					
				* TARGET DATE FOR COMPLETION					
				* OTHER DEPARTMENTS WHICH MUST COOPERATE TO ATTAIN THE OBJECTIVE					

FIGURE 4.7 Operating action plan.

## Managerial Planning

Planning is one of the essentials of modern business enterprise and of modern life in a complex society. Planning of a spatial nature is required under the federal transit aid programs. This is not the same thing, however, as managerial planning (see Appendix 4A). Managers should always plan so that there is a minimum of unexpected events and so that actions are premeditated; managers are obliged to do this using the MBO process. Whether or not MBO is used, a process of long- or short-range planning must occur. Planning allows the organization to foresee and adapt to change, and to take advantage of opportunities. Thus, planning is essential to the proactive stance and style of management; without it, an organization and the people within it can only react to situations.

### Basic Stages

There are several general steps in planning. First, goals and objectives should be established, providing a framework for planning and broad general guidelines for decision making. The second step is data collection. Pertinent information is researched and brought into useful and coherent form. Before collection is begun, guidelines should be established for the detail and depth of the information desired. This step will eliminate some confusion and simplify collection.

Data analysis. After data have been gathered, analysis begins. This description sounds more formal than the process really might be. Analysis may range from a simple mental weighing of pros and cons to a highly sophisticated program using a computer. The analysis should provide the basis for a decision as to what to do and how to do it. Following this decision, implementation begins. Finally, follow-up and evaluation of the decision are usually helpful in making future choices and in revising plans that already have been implemented. In essence, the MBO program discussed earlier fits in nicely with the need for planning.

Long-range planning. Long-range planning is oriented toward future opportunities and potential problems. It also provides the means of evaluating what may be established as future goals and objectives, based on the best understanding possible of the present. Long-range planning means attempting to understand all aspects of the environment in which the transit firm operates; this requires a view of the situation that exists outside the immediate organization. It is very easy to become ingrown in one's work and the efforts put forth to achieve certain goals. Long-range planning forces management to break out of the shell of the particular organization and look outward. This is

particularly essential for mass transit management, since as a public service it depends upon the good will of outside institutions for funding and support.

Short-range planning. As a part of MBO, short-range planning becomes an integral part of the enterprise's activities and therefore is caught up automatically in the stream of activities for a given time period. Long-range planning, on the other hand, must be made one of the goals to ensure that it will be carried out.

The steps delineated are quite general and might apply to either long- or short-range planning. One year often is used as a break point between long- and short-range. Short-range planning involves planning for events that take place in less than a year and might really be called operational or tactical planning. For periods of 1 to 30 or more years, long-range planning or strategic planning takes place. For example, entry into the charter business might be considered as a long-run proposition that involves acquiring authority, gauging the market, providing necessary manpower and equipment, and, probably, feeling the impact of whatever decision is made for at least 2 or 3 years. On the other hand, checking in new equipment--familiarizing drivers, making the initial inspection, working new equipment into schedules for maximum benefit--is rightly considered short-run. Here, the time span is several months at most, and if results are unsatisfactory, any of the items can be corrected rather quickly. While the distinction between the two kinds of planning is not rigid and often is a little indefinite, it provides a handy and helpful framework for consideration.

### Information Sources

Information gathering is of great importance to the planning function as well as to other operations. There are many sources of information for planning. Some are internal to the firm, others external. One internal source is the vast amount of accounting data and statistics that can be developed from operations including passenger counts, revenue analysis, labor records, maintenance records, supply records, and all of the other items that come from the operations performed. In addition, information can be gathered from the drivers, who deal directly with the customers, and from unsolicited letters and calls that the firm receives.

The manager has less control over external sources, although there are a variety of items available. One source is a special report done by an outside consultant. Another source is personal--the manager's contacts with other community leaders. These contacts may come in a professional capacity, but much is likely to be learned in

social interactions with business and political leaders. Various published data sources are available, including Census material, reports developed by the chamber of commerce or other local business, and records of various government offices. In addition, trends or developments that sometimes escape other channels can be found simply by touring the city and noting what changes are in progress. These and many other sources can be used to gather the data necessary for analysis.

### The Organizational Structure

The term "organization" has been used in this chapter a number of times without discussing it very thoroughly. Organization is used here in the sense of an administrative and functional structure. It involves the process of systematically planning and arranging a united effort and shaping human and material resources into a functioning whole.

Organization will maximize the efforts of those involved by channeling the efforts of individuals toward the objectives of the organization and dividing and fixing authority and responsibility for action.

The essentials of organization involve the following:

1. All work must be divided into specific tasks among the employees.
2. Responsibility and authority must be fixed for each employee.
3. The chain of command must be clearly established, specifying the authority to whom each employee will report.
4. The activity of individuals must be coordinated so that the desired goals can be met.

### Types of Organization

The principal reason for establishing an organization is to increase the productivity of the people who are a part of that organization. Individuals organized into a team have much more power than the same number of individuals operating independently. Whether in business, government, or other institutions, the major job to be done must be divided into relevant pieces, and the efforts of individuals must be channeled toward meeting the objectives of the undertaking.

Several forms of organization may be used in any undertaking; transit is no exception. All involve dividing and fixing authority and responsibility, a matter that becomes more difficult and complex as an organization increases in size. Because this handbook deals with relatively small-scale organizations, problems of great complexity should not arise.

Line organization. Before discussing forms of organization for small-scale mass transit undertakings, it would be wise to discuss in general terms the various types of organization. Probably the simplest type of organization is the line type, which is illustrated in Figure 4.8. In this set-up, the president directs his assistants, each of whom is responsible for specific parts of the operation. The departments are established on the basis of functions that must be accomplished. In turn, each assistant directs others who are responsible to him. The chain of command is unquestionable when each person can understand exactly to whom he is responsible for the performance of his assigned duties.

Line-and-staff organization. The line-and-staff organization is similar to the line organization in that the line executives still are concerned with making all major decisions; they are the persons who issue the orders. As firms grow larger, however, the work becomes so complex that no one line executive or manager can become expert in all details of his particular function. Therefore, it is desirable to use the services of specialists. None of these people has direct line authority, except within his own particular area. Specialists of this sort are called staff executives.

For example, the director of marketing research or the advertising manager provides staff services for the vice president in charge of marketing in a firm manufacturing soap or household appliances. As shown in Figure 4.9 however, the market research team has no direct command relations with the sales force.

It is difficult to say at what point it becomes necessary to move from the simple line type of organization to line-and-staff organization in the transit business. If a publicly owned transit firm is regularly involved in federal or state transit aid programs, it must carry out a regular program of planning and grant administration. Such a property would require the services of a specialist, whether it had 10 buses or 100. Because the scale of planning and grant administration is apt to be much smaller for the 10-bus property, the person specializing in the planning and grant administration area may also have some other duties; for the 100-bus property, the specialized

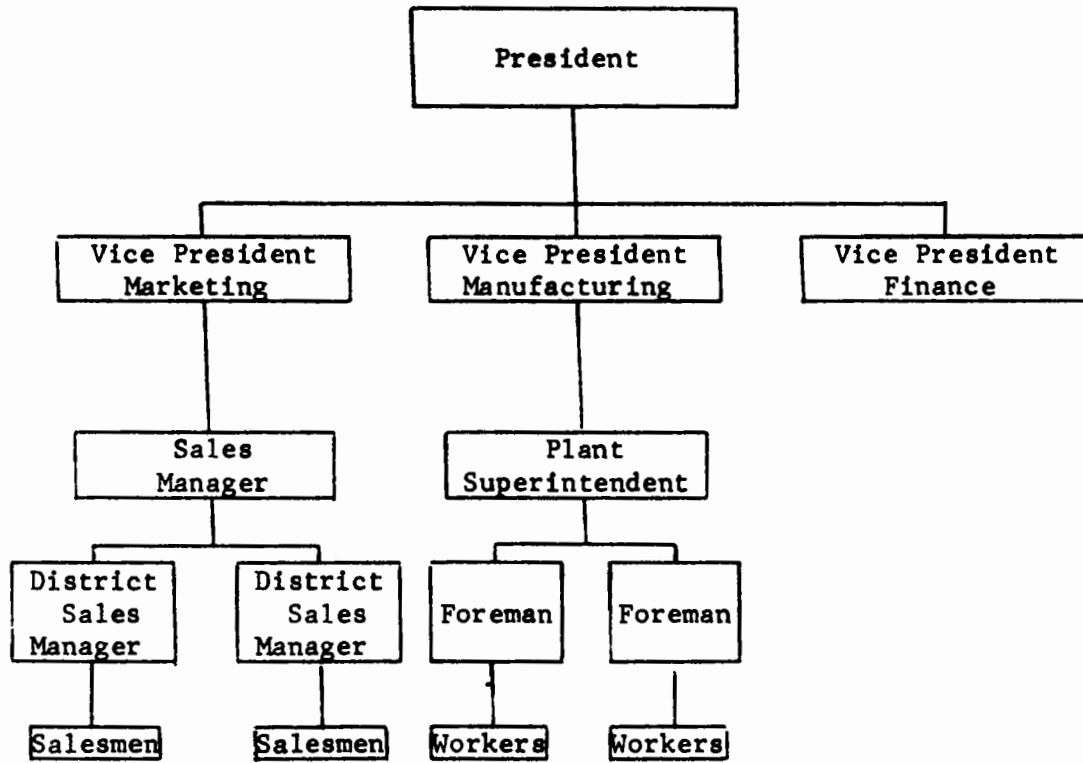
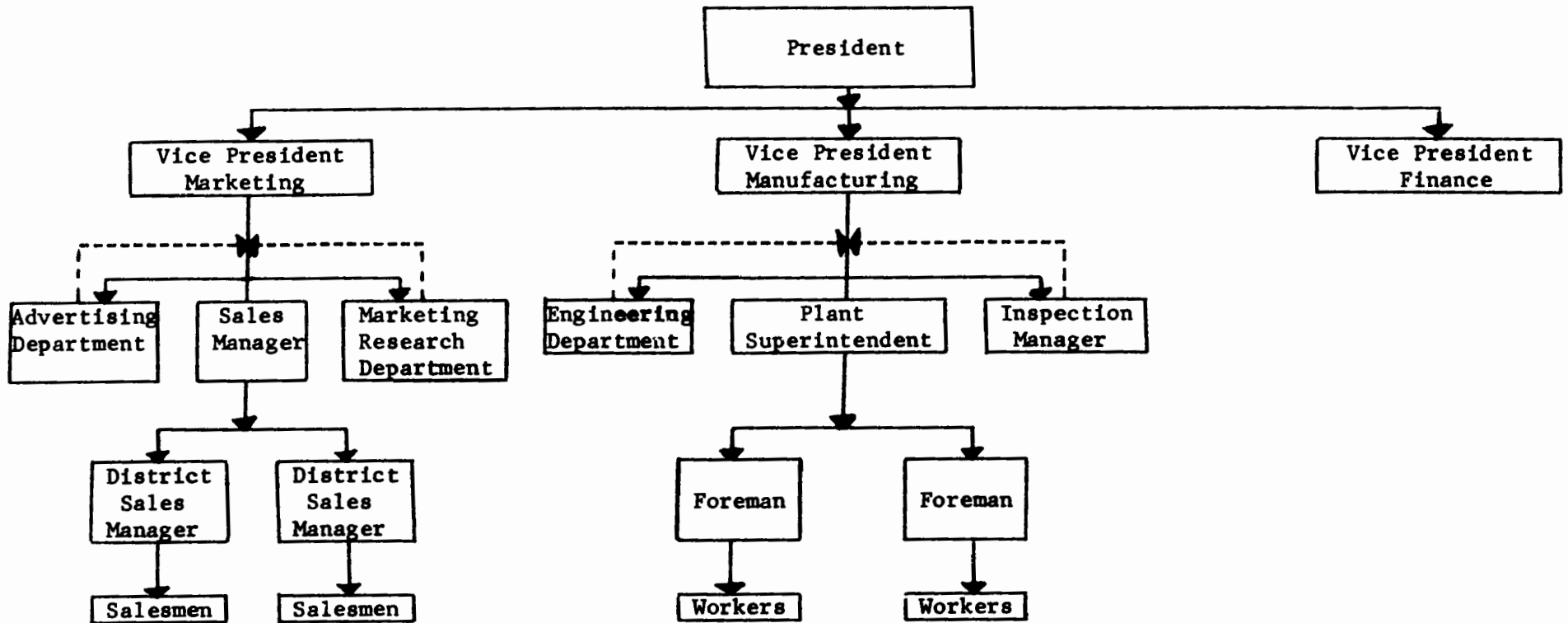


FIGURE 4.8 A simplified line organization.



\_\_\_\_\_ Flow of Line Authority  
 ----- Flow of Staff Authority

FIGURE 4.9 A simplified line-and-staff organization.



function is likely to be the sole duty of one or more persons.

Organizational charts. When considering organization charts, a distinction must be made between the functional organization chart and the personnel organization chart. The functional organization chart shows the tasks to be done and the arrangement of those tasks into line and staff relationships. More than one person may be fitted into one of the boxes on the chart, or one person may handle the jobs involved in several of the boxes. The larger the transit property, the greater the need and possibility of specialization. Many of the sample charts that will be used here are functional charts showing the jobs that have to be accomplished. The management of the specific property decides how the personnel will be fitted to the functional needs of the organization.

#### Typical Organizational Form for the Small Transit Firm

Figure 4.10 shows the typical form of organizations for small-scale mass transit firms today. The general manager oversees three separate functions: maintenance, operations, and accounting and office work. The manager does all the necessary staff work. The maintenance and operations foremen may do the highly specialized staff work themselves, and in a very small firm they probably perform some of the subfunctional work in each functional area.

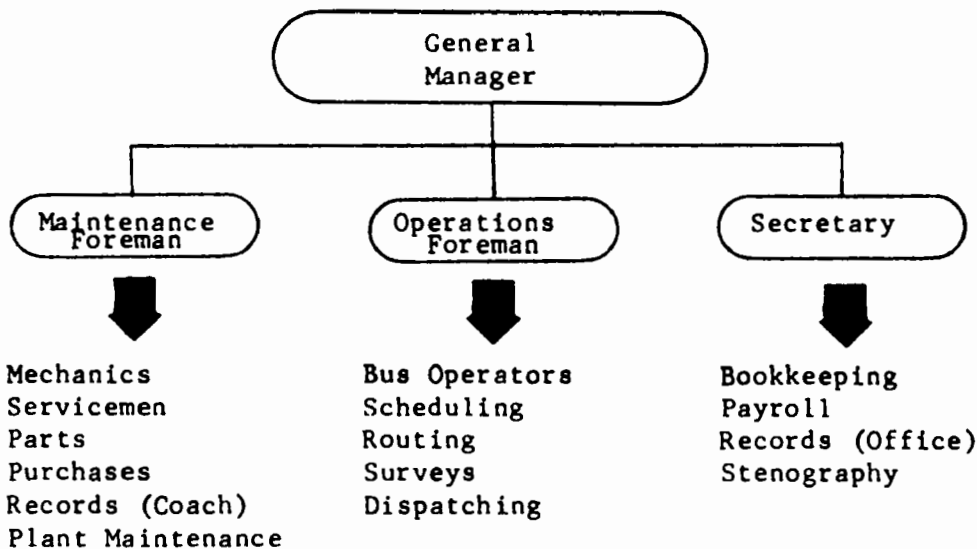


FIGURE 4.10 Typical small-scale mass transit organization.

The weakness of this type of organization is its lack of a marketing function and the planning/grant administration function. It is wholly operations-oriented. The main reason for showing it here is to present an example of what should be avoided in the transit world today. Even so, the reality of constrained budgets may not permit all the needed jobs to be done. In this case marketing would probably be neglected totally; persons from city government--probably the planning department--would help on the tasks of transit planning and grant administration.

#### Recommended Organizational Form for the Small Transit Firm

Transit usually is considered to be--and by industry practice and tradition is--a prime example of a production-oriented enterprise. In other words, major management interest and attention is focused upon producing the product rather than selling it. Because transit managers have been able to produce their service fairly efficiently over the years, it seems that the problem facing management is not how to make transit service but, rather, how to sell it.

Therefore, in devising a functional form of organization for a small-scale transit undertaking, this handbook deviates from the standard practice in the transit industry. The recommended set-up is a marketing-oriented form of organization illustrated in the functional organizational chart in Figure 4.11.

Figure 4.11 shows that the whole effort is strongly marketing-oriented; marketing and operations are combined as the major central function. This combination is made to review the sensitivity of the organization and coordinate operations. Marketing blends management's resources and controllable factors into the combination that best serves the desires and needs of transportation consumers. All the other parts of the enterprise help support the marketing and operation function. For example, "General Services" includes a number of tasks grouped together to provide manpower and equipment to help management carry out its transit marketing program. The grant administration/planning function is purely a staff function, reporting to the general manager. It is responsible for seeing that planning is carried out and that proposals for federal aid are submitted. After submission there is the need to follow up and administer the proposal once the grant has been received.

Similarly, the main task of "Information Services" is to collect and analyze the data needed to help management better understand its market and to help make decisions affecting service and financial matters. In the latter

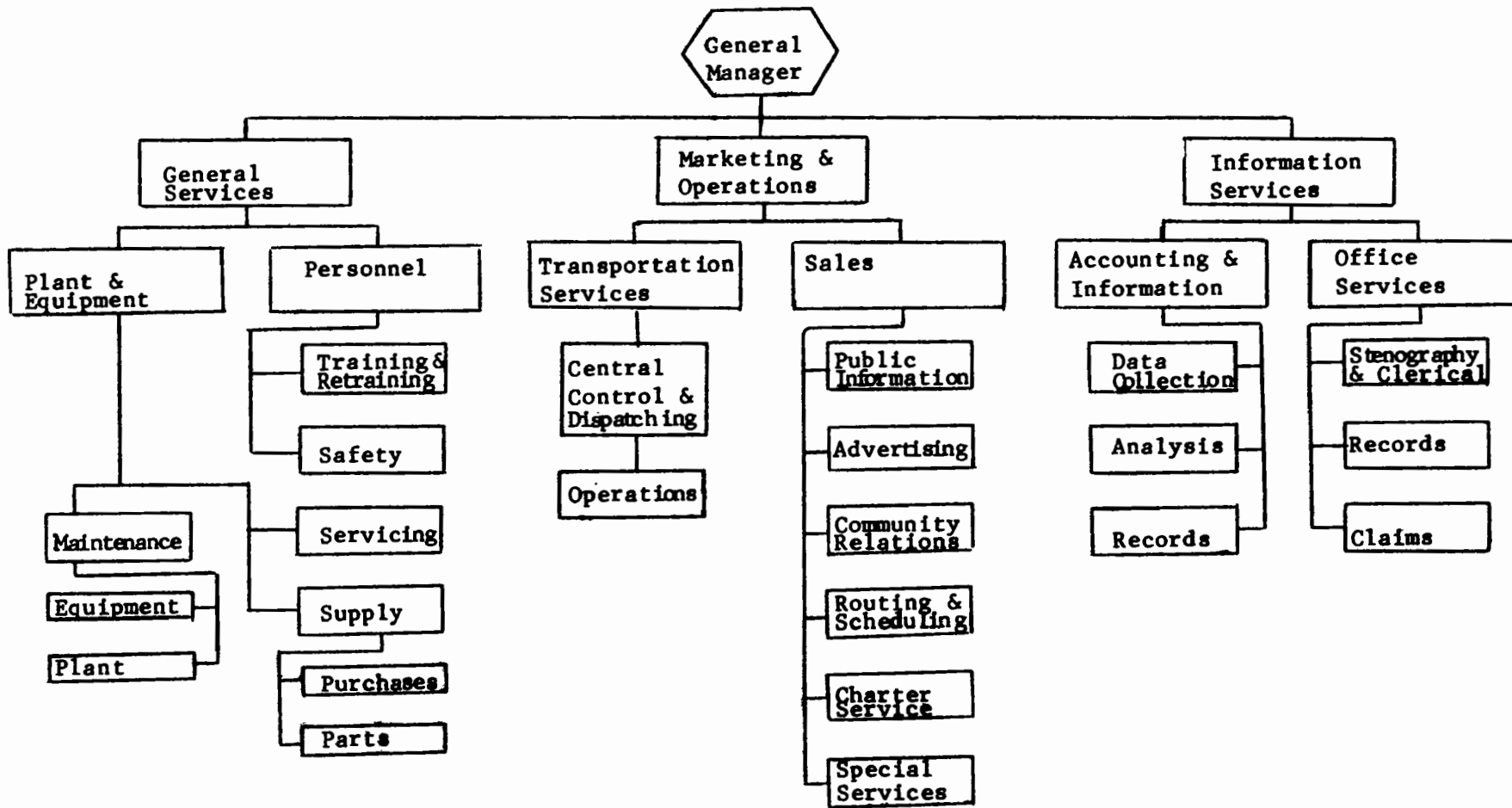


FIGURE 4.11 Suggested organizational chart for small-scale transit firms.

category, it provides accounting reports for management, owners (public or private) and regulators.

In reviewing Figure 4.11, several things should be kept in mind. First, the diagram is intended to show organizational structure. It is not a personnel organization chart; the diagram illustrates jobs to be done and their relationships, not necessarily slots for individuals. Obviously, a very small transit firm could not possibly have separate individuals performing each function; the jobs simply have to overlap. With larger firms, increasing complexity and the opportunity for greater specialization makes it possible if not necessary, for the functions to be carried out by separate persons or even small departments.

Second, the organizational structure is intended to be used as a guideline in drawing up individual organizational charts for specific firms. Because local conditions have to be taken into consideration, it is simply not possible to provide organizational charts tailored to specific situations. Nevertheless, skeleton organizational charts are given as examples on the following pages.

#### Sample Organizational Charts

In the smallest type of operations--1 to 10 buses might be considered a representative size--the general manager, a chief mechanic, and a secretary can handle all matters, unless operations are very complex (see Figure 4.12). The entire operations and marketing functions are under the direct supervision of the general manager. A working maintenance foreman oversees repair and service work, and a secretary oversees the information and record keeping work in the office. Individual need determines the actual number of mechanics, drivers, and secretaries to be employed.

In a medium-sized operation--between 11 and 30 buses--the chart shown in Figure 4.13 might be a useful guide. In this system, the manager directs the operations end of the business, with the help of an operating supervisor. The manager personally handles the less routine marketing tasks and coordinates the marketing effort. An assistant manager or sales manager handles the more routine marketing program. A chief mechanic or maintenance supervisor oversees the maintenance and servicing of equipment. A safety supervisor takes care of training new employees and of overseeing the safety program. The information and clerical services are under the direction of an information and office manager, who personally handles much of the information collection and analysis and the preparation of reports and accounting statements. Once again, the actual number of employees involved depends on need. A rule of thumb often used in the transit industry is

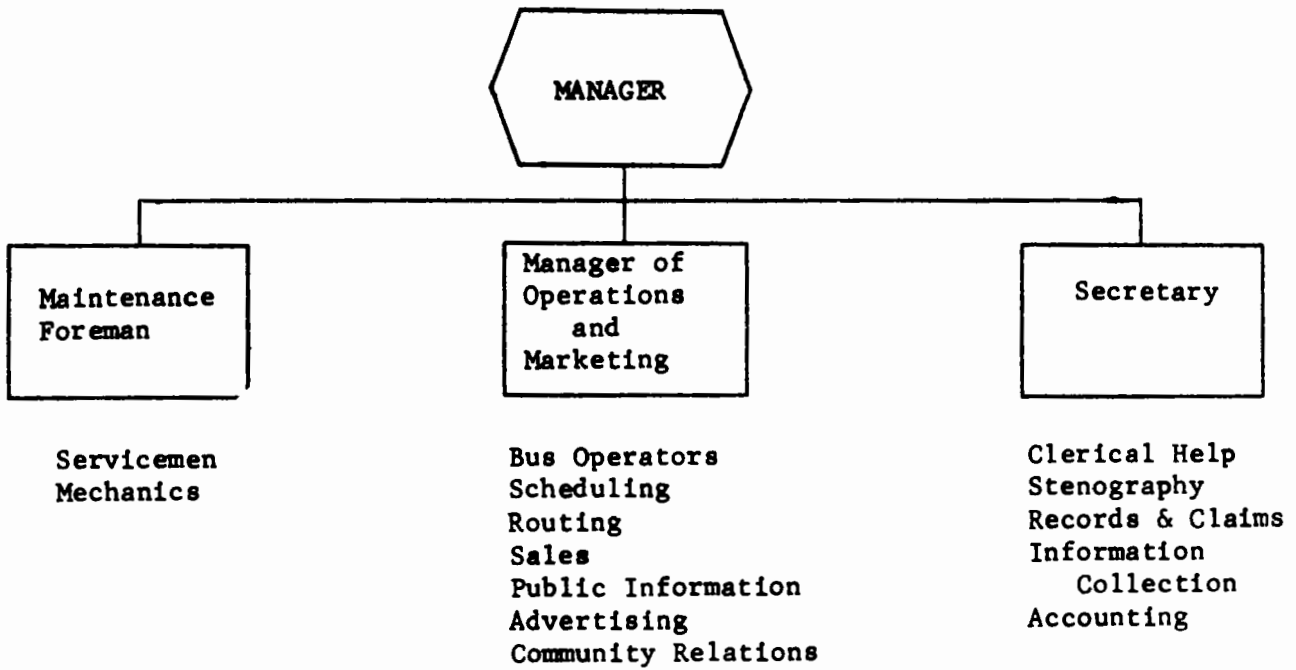


FIGURE 4.12 Organizational chart--small-sized firms (10 or fewer buses).

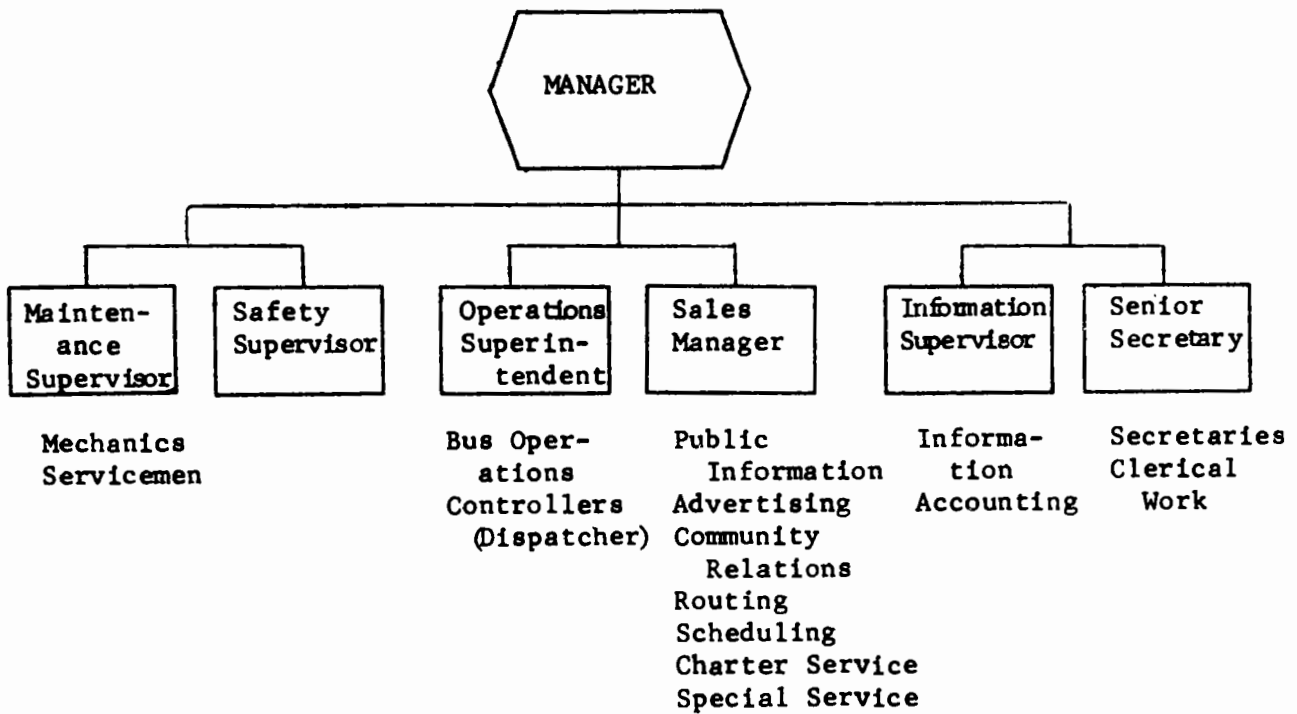


FIGURE 4.13 Organizational chart--medium-sized firms (11 to 30 buses).

that about 1.75 employees are needed for each bus in operation.

At the larger end of the scale--30 to 100 buses--a situation such as is shown in Figure 4.14 might fit. In this example the degree of specialization is much greater, with a superior for each of the three major functional areas. At the lower end of this size range, the general manager probably would supervise the operations and marketing areas. Actual conditions and the complexity of the undertaking would, of course, determine the finer points of the organization.

### Other Major Management Tasks and Problems

Management of transit, in addition to all of the elements spelled out in the previous pages, demands that close attention be paid to the supervision of employees, coordination of effort, and an understanding of the constraints imposed on management.

### Supervision of Employees

A specific responsibility of the manager is the supervision of subordinates. Although labor can be considered a resource, it differs from most other resources in that it has a personality. While a machine will run very predictably if set up in a standard manner, a man may--indeed, probably will--react differently at different times. The manager must learn to adapt to unpredictability.

Because of the nature of mass transit operations, there is a need for close supervision and support. The operator of a transit vehicle cannot be supervised closely, as can employees in an office or a factory. At the same time, the operator is exposed to the difficulties and problems that arise from running a large vehicle over the public streets and being exposed to the frustrations of traffic and of dealing with the public. Close supervision must be provided through a combination of human supervisory personnel and mechanical devices such as two-way radios that augment human supervision. The operator must be further supported by training sufficient to meet the daily challenges, by equipment that is in good operating condition, and by schedules that are realistic and attainable.

Obtaining maximum effort from employees is a subject that has received wide attention, but few concrete answers have been produced. Various theories on handling subordinates have developed, and the successful manager may use techniques from all of them, suiting the theory to the particular task and individual in question. In many cases, the experience gained in dealing with employees seems to be the best instructor.

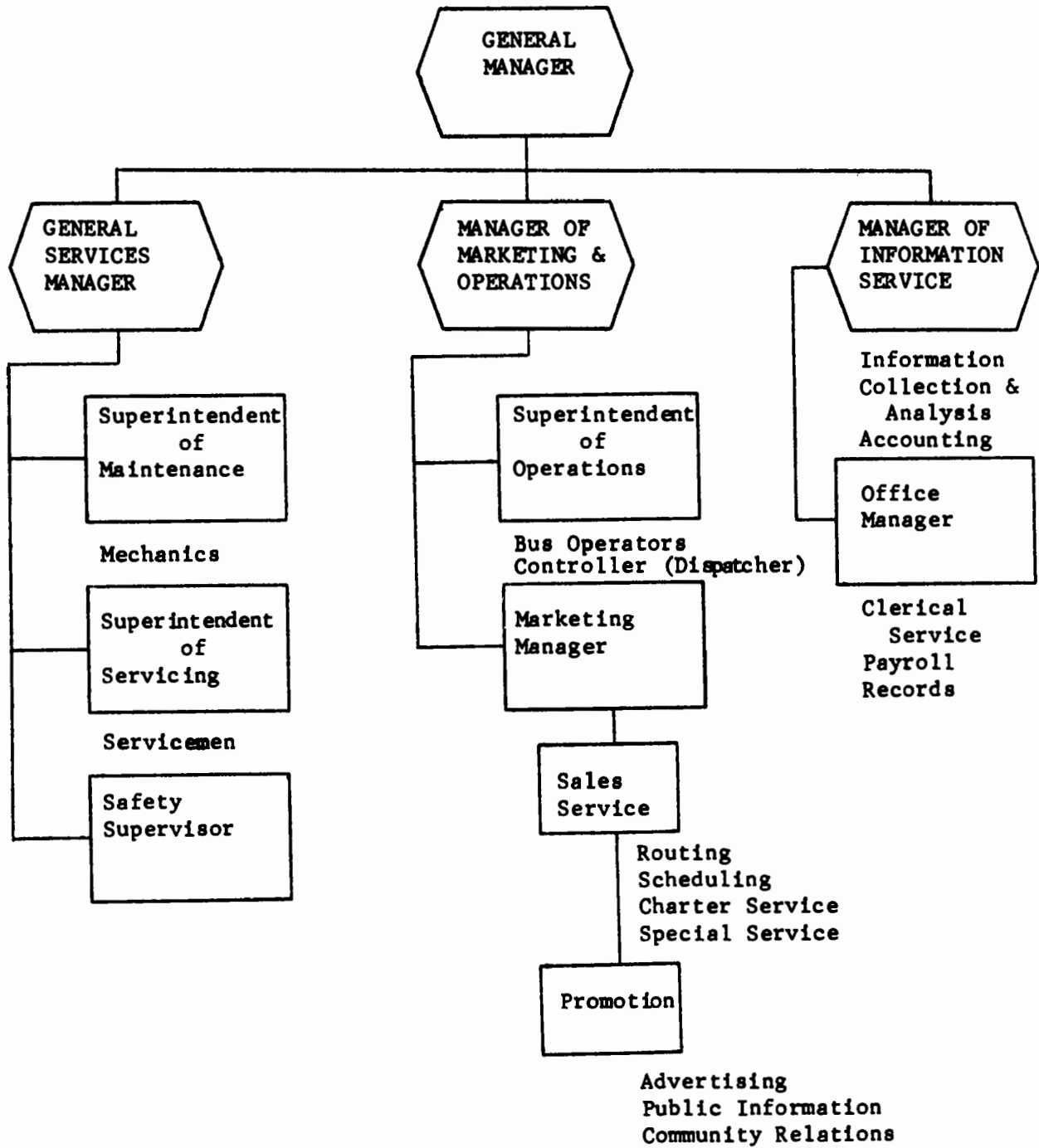


FIGURE 4.14 Organizational chart--large-sized firms (31 to 100 buses).

In addition to obtaining maximum productivity from workers, the transit agency or the manager may have other goals, such as retention of workers, low turnover, happy employees, or steady employment levels.

In a service organization in which labor is very important, the supervision and handling of employees is of great significance. In transit, where decisions about whether to ride the bus or go by other means are made, not on a strictly rational economic basis, but a psychological one, the effect of the personnel on patrons can swing the decision either way. This factor is most important with drivers, but also with people handling the information phones. A smile or a curt remark can mean the difference between a loyal patron and a former patron.

MBO, with its necessary involvement of employees at all levels, appears to help maintain employee morale and improve productivity. The sense of moving toward known goals is helpful to all employees, and a certain sense of enthusiasm may be generated as clearly defined objectives are attained.

Institutionalization of transit also is a critical part of employee supervision. As noted in Chapter 3, the employees must be sold on what the transit agency is. They must be the first to recognize the value of transit, if it is to be communicated to others. The importance of transit to the community and to the persons served has to be made clear. Seeing that vehicles run up and down certain streets on schedule is, in and of itself, not particularly inspiring; helping a community to function properly is a task that can enlist the enthusiasm of many persons, including the employees.

#### Coordination of Effort

The transit organization, like most others, can be viewed as a myriad of small groups. Each group is concerned only with specific aspects of the business. Maintenance is concerned with keeping the equipment running; accounting is concerned with keeping the books in order. Both elements are necessary functions of the enterprise, and it is the enterprise as a total system that must be optimized, not a particular part of it. Top management has the duty of harnessing the individual thrusts of the different departments into an effective, coordinated effort.

This point is true not only for the enterprise as a whole, but also within each department. Each employee has a particular task, and all employees' efforts must be combined to the best advantage by the department heads. Department heads must not only possess technical skills, but also human relations skill to carry out their duties effectively. They must be able to view their department as a whole, rather



than as a group of separate pieces, and use it to its fullest.

The higher a manager's place in the hierarchy, the broader the view he must take of the organization. The people at the top concentrate on operation of the entire system, but as a rule they do not get deeply involved in particulars unless there is a problem in some area, such as difficulties in attaining objectives under an MBO program. As soon as a problem is solved, the area is again viewed only broadly, except for occasional spot checks to see that corrections are progressing.

MBO is a useful tool in the process of coordination of effort. Properly applied throughout an enterprise, MBO can be a major force in providing the necessary coordination.

### Constraints on Management

A number of factors constrain the transit manager's actions. Regulation of routes, fares, and schedules is one constraint. In addition, limits of authority can be imposed by the governing body, whether a transit authority, a city council, or a private firm's board of directors. For best results, these constraints should be minimized if a manager is truly to manage.

Other major constraints are possible in addition to limits on authority. One of the most important in the world of transit is cost, or the shortage of funds. Obtaining available funding is discussed in Chapter 3, but using funds is the manager's responsibility. New concepts will be tried only rarely if it is impossible to underwrite costs of new services until they are established and either self-sustaining or supportable from operating subsidies. The manager often is forced to stick to accepted methods, because any experimentation is likely to produce expenses far greater than revenues, especially in the short run. Much of the difficulty that transit has faced over the years is because of a lack of funds for the bold steps often needed for a fair chance of success.

In a new system, the manager has the opportunity to start with a clean slate in establishing the organization and the service patterns. However, few opportunities of this kind exist. In most instances, the manager will deal with an existing situation and will have to honor and live with many decisions that have already been made. For example, equipment will be on hand and the route and fare structure already will be established. While these items can be changed, change usually requires considerable time and effort. A labor contract is another example. The past history of a property's labor negotiations will affect future negotiations, regardless of the presence of a totally

new management group. Thus, the manager is hemmed in both by what the property is today and by what it was in the past.

The manager also must learn to live with the physical characteristics of the area. Streets are already established. While they may be upgraded and improved at times, changes are not likely to be made only for the benefit of transit. Minor modifications, such as the elimination of curb parking, can be made from time to time to benefit transit, but their impact is somewhat limited. The federal government's Transportation System Management (TSM) element, with its mandate to make better use of existing facilities and encourage the use of high-occupancy vehicles, offers transit management an opportunity to work with city officials and planning organizations to plan and program street changes for the benefit of transit.

### Some Guidelines for Management

There are a few guidelines that are useful in performing duties. These guidelines are not inviolable rules, but merely variables to be applied differently in different situations.

Flexibility. Flexibility is a catchword to which everyone pays lip service in principle. In practice, however, the concept often proves to be elusive. The need for flexibility arises out of the fact that the environmental conditions under which an organization is set up are rarely the same for long. A good example can be drawn from mass transit operation. Cities grow and change at a rapid rate, thus patterns of potential demand for mass transit also change. However, transit routes are frequently left unadjusted. Such inflexibility can impose high costs on the system's efficiency and usefulness.

Flexibility may demand frequent adaptation or major changes at less frequent intervals. How is flexibility achieved? It is achieved partly in the process of policy formulation. For example, the anticipation of uncertain future developments may require the preparation of contingency plans. Flexibility also is partly achieved in the structure of the operation itself--for example, in the capacity to grow or contract without losses in efficiency. It also means that goals and objectives must be monitored and adjusted constantly to remain valid and rational for the transit agency.

Unity of command. No member of an organization should report to more than one superior for any given function. The intention is to avoid the problem of conflicting orders from different people on the same subject. This guideline generally works quite well in a line organization; however,

it is not so easily applicable where a form of staff or functional structure is used. In these cases, lines of authority often are much more blurred.

Exception principle. The exception principle is concerned with delegation of authority. Under this principle, routine decisions should be handled at the lower levels of management; top-level managers should be concerned only with nonrecurring or "exceptional" decisions, for which no easy solutions are readily available.

Span of control. This guideline focuses on the number of subordinates a manager is capable of supervising. Too small a span of control leads to a top-heavy organization, while too large a span leads to a loss of control. The right number in any particular situation depends on many different factors, but usually is tied to the number of levels in the hierarchy of the whole organization.

Scalar principle. Under this principle, authority and responsibility should flow clearly from the top to the bottom of the hierarchy. This principle seems too obvious to require emphasis. Yet it can easily be violated when managers of departments or divisions fight to create their own "empires" within the larger organization.

Management also must be careful to see that information flows both up and down in the organization. The flow of information must be a two-way process if the organization is to function properly, because neither management nor employees can function at their highest level of efficiency without a free exchange of information.

Management also should be on guard to avoid undue political pressures. For example, pressure could be applied to hire friends of local political figures, especially if the transit system is a city department. Management must make an effort to resist these pressures courteously but firmly if it is to run a progressive transit system that is free of some one else's mistakes.

Pressures also may be brought to hire friends or relatives of the transit agency's staff. Needless to say, personnel should be employed on an objective basis. Transit management is a difficult job at best; to have to deal with political hacks, cronies, or with relatives is more than anyone should be willing to bear.

### Responsibilities of Management

Transit management, whether private or public, has a number of internal and external responsibilities. Internally, management is responsible to owners and to employees; externally, management is responsible primarily

to the public. These responsibilities often must be balanced against each other. For example, the public may desire a frequency of service that is too expensive for the owners of the property--be they private individuals or a public agency--to tolerate. Therefore, some middle ground must be found.

Responsibility to the owners is of paramount importance in the privately owned firm. The owners ordinarily expect to make a reasonable return on their investment. Management must consider this its primary responsibility against which others must be balanced. Public ownership, on the other hand, demands that management make prudent use of the public resources entrusted to transit.

The public, by acting through its elected and appointed officials, will determine what management should do. In effect, the desires of the public help to set the goals of the transit agency.

#### The Role of the Board of Directors

The governing body of a privately owned transit enterprise is a board of directors. With a public transit authority or other public agency, the term "board of directors" also is typically used. Where transit is a city department, it may be governed by a board of works or utilities commission; in other cases the city council may act as a board of directors. For the sake of convenience, the term "board of directors," or directors, will be used here, but the material applies to any of the various groups noted above that may play a role in the governance of transit. Whatever the means or the name given to the body, the task of the governing body is to deal with broad policy matters.

In a private enterprise the board represents the stockholders and helps to guide the corporation in the best interests of the owners. In a public enterprise, the responsibility of the directors is to the public, which is the real owner of the transit agency. They have the main task of dealing with the public and public officials. From an assessment of public needs and desires, the board will establish the goals of the transit enterprise and work with management in the development of priorities and the formulation of some of the broader objectives. The board also has the job of establishing the policy of the transit agency on key matters, such as a policy of working with state and national lobbying bodies to help increase the amount of aid available to transit from federal and state sources.

A principal task of the board of directors is the selection of top management. This means naming a general manager to oversee the day-to-day operation of the transit agency, or hiring a professional transit management firm to handle the management chores.

Once having named top management, the proper role for the board of directors is to stay out of day-to-day management matters; otherwise, there would be no reason to hire management. Management's job is to carry out the policies and goals laid down by the directors. If management does not perform, it should be replaced, but it is critical that the directors do not try to manage the transit firm's operations. Problems that are particularly difficult or that impinge upon the goals and policies established by the directors, should be brought to the attention of the directors by management. Management also should seek guidance on sensitive matters or on matters that may involve the political sphere. An important point is that the directors should run political interference for management. Management should not be subjected to political pressure. It is the job of the directors to receive political input and to deal with elected and appointed officials of local government. The political input then should be filtered by the directors and passed on to the management in the form of goals and policies.

It is reasonable for directors to study some issues in great depth to provide advice and counsel to management in problem areas. For example, a group of the directors may be formed into a finance committee or a marketing committee, to study these issues in depth. This will enable the board to shape goals and policies on the basis of more extensive information and to better understand the problems faced by management. This role may be particularly important where the transit management team is small.

It is essential that management keep the directors informed of all important issues, both at official meetings of the board and through reports and other information circulated between meetings. Top management personnel should attend all regular board meetings to help answer questions raised by the public officials. The general manager should be an ex officio member of the board of directors, without voting power.

#### The Management Process

Figure 4.15 is an attempt to illustrate the management process. At the top of the figure the board of directors is shown in its role of translator of the public wishes and as the body that deals with the political community. To the left is the managerial pyramid, showing that there are relatively few persons in top management, more in middle

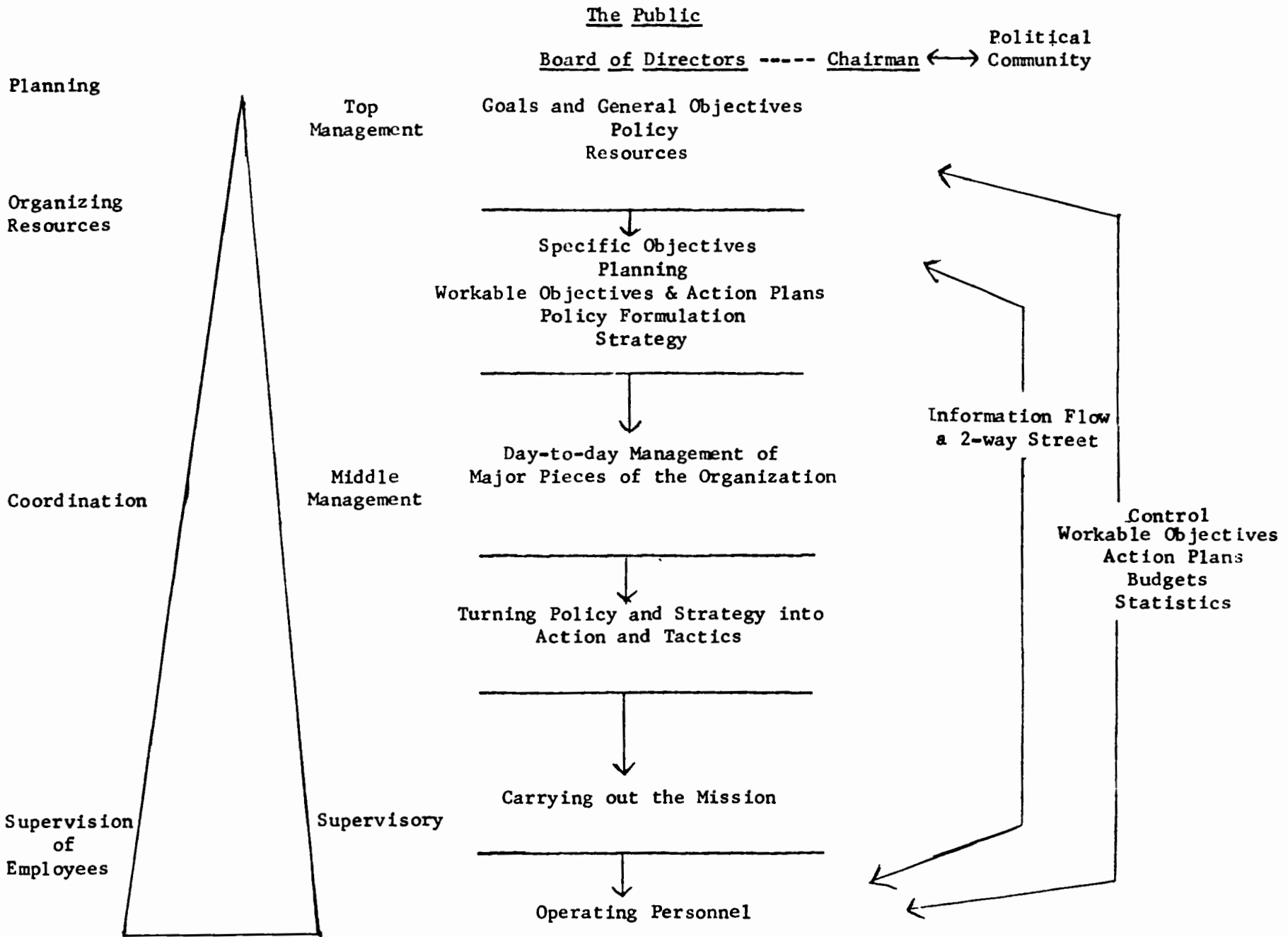


FIGURE 4.15 Management process.

management and a larger number in supervisory positions. In a very small transit agency the same persons may play several roles and carry out the functions of top, middle, and supervisory management. The general tasks assigned to the various levels of management are shown at the left of the figure.

The central portion of Figure 4.15 shows the tasks of the various levels of management. Top management works with the board of directors in the translation of goals and general objectives, policy, and resources into more specific objectives. Top management, in conjunction with middle management, helps turn specific objectives into action through the planning process and the development of action plans. From this will come the formulation of internal policy and the evolution of a strategy to meet the goals and objectives that have been laid out. Middle management has the task of day-to-day management of the major pieces of the transit organization, such as operations, maintenance, marketing, information systems, and grant management. Middle management, with the help of supervisory personnel, has the job of turning the policy and strategy associated with objectives into the necessary action and tactics. Finally, the supervisory personnel carries out the established tasks through its dealings with personnel on the operating level.

On the right side of Figure 4.15 is a sketch of the means used to hold the organization together. Information flow is critical to a smoothly functioning enterprise. Note that it is shown as a two-way street, to indicate that information must flow both ways through the organization. The control function flowing through the organization consists of the objectives that have been established and the action plans that have evolved from the objectives. The budgets and statistical information stitch the process together and provide benchmarks on the progress made toward achieving goals.

### Management Personnel

Good management talent is a scarce resource; this is especially true in the mass transit transportation field. A person with managerial experience in fields other than transit may have difficulty fitting into a transit position, and experienced transit managers will command a high price.

The typical smaller transit agency will have a small management team. At smaller properties, one or two persons will run the show. The somewhat larger properties will have a slightly larger management team, but probably not more than three or four members. With such a small team, management personnel ideally will be generalists instead of specialists. At the smaller property, the manager will have

to know the entire operation. More specialization can occur as size increases, although the small transit property, obviously, can never reach the high degree of specialization found in large transit properties in larger cities.

Good managers may be hard to find, but here are some qualities to look for: knowledge, communications, and foresight.

Knowledge. A transit manager should be well versed in operations. Preferably, he should be capable of driving a bus and should have some mechanical knowledge. When the occasion demands, the manager should be able to go to work beside his employees without having to stop to find out what is going on. Such knowledge can be very useful because the manager of a small operation never knows when he will be required to pinch hit for one of his employees. It helps the manager to keep his finger on the pulse of the organization. A knowledge of operations also will help to establish rapport with the personnel. They are bound to have more respect for a manager who is able to do their jobs--a critical factor in an intimate operation--and to understand their problems. The manager who is cold and aloof is an anachronism.

The manager must, however, be able to keep enough distance between himself and his employees so that they will respect him and so that he can maintain discipline. In this respect, the manager's job is like walking a tightrope. He has to be very careful to maintain a middle ground without going too far one way or another.

As in most fields of management, there have been few women heading up large or small transit properties. In recent years, however, many women have entered the transit industry, and well-qualified women are available for those seeking managerial talent.

Communication. A good manager of a small transit property must possess certain social abilities. Because the manager will have to carry on much of the public relations effort, he should be an extrovert rather than an introvert. The manager must be able to associate on equal terms with local businessmen and government officials. Preferably, he should have a buoyant, optimistic, and cheerful nature. To a large extent, the manager will represent the transit property in the eyes of the public.

The manager must, by all means, have an appreciation for community relations, especially because management must attempt to keep public interest at a fairly high level. A person in a highly visible enterprise like transit cannot perform effectively if his light is hidden under a basket. On the other hand, the manager should avoid a reputation as



a flamboyant wheeler-dealer who seeks publicity for the sake of publicity and personal advancement. An honest, sincere person will inspire more confidence.

Foresight. The manager should be a person with foresight, who can grasp opportunities when they arise. If possible, the manager should be a college graduate, preferably with a business degree or a considerable amount of work in business subjects. However, the desire for a college-trained manager should not preclude consideration of a well-qualified person without a college degree. The prospective manager, whether possessing a college degree or not, should realize the need for continuing education and take steps to fill that need. The manager often will deal with well-educated persons in business, government, engineering, and planning. The transit manager must be their peer in professionalism, or he will have difficulty in finding the right buttons to push outside the transit enterprise in order to meet the goals of the firm.

Necessary areas of training, knowledge and interest for a manager include:

- \*\* Management.
- \*\* Accounting.
- \*\* Marketing.
- \*\* Transportation and public utility economics.
- \*\* Behavioral sciences--psychology and sociology.
- \*\* Political science and applied politics.
- \*\* Personnel management and labor relations.
- \*\* Business law.
- \*\* Computer science.

If the transit property has a one-person management team, the manager will have to come as close as possible to the ideal. If several people make up the management team, some degree of specialization is possible. For example, if two persons run the property, one might handle the public relations and promotion effort exclusively, while the other might concentrate more on the day-to-day operations of the property. The latter individual would be more in the background, whereas the public relations person would represent the system to most segments of the public.

## Sources of Managerial Talent

Whether private or public, when a transit board is looking for management talent it should know where to look.

Word-of-mouth. Contact with other managers in the transit industry can serve as excellent sources of information on available management talent. If someone is successful on a particular transit system, the word will get around quickly. Inducements might include higher salary, greater opportunity to advance and/or to be his own boss, or a greater challenge than is currently available. Before making an offer, management should study the person carefully to formulate a successful appeal.

People who are brought in from other firms usually are partly trained already. This training can be either beneficial or harmful to the firm, depending on how the firm's methods and procedures differ from those of the employee's former company.

Colleges and universities. Colleges and universities can serve as excellent sources of management talent. Although the needs of the small transit firm do not lend themselves to a large-scale recruiting campaign, management can and should establish contact with the directors of placement at nearby universities. Another possibility would be establishing contact with a professor of transportation or business who has an interest in the urban transportation industry. Such a professional will have contacts within the industry and with current and former students who may be excellent prospects for places on a transit management team.

Some students might be able to work on the transit property during their summer vacations. In this way, a young person can gain valuable first-hand experience, and existing transit management can get a good idea of the summer intern's capabilities and aptitudes. If a young person appeared to be promising management material, he could be offered a management position upon graduation from college. This plan probably would provide enough talent to keep a modest-sized property's management quota well filled, especially if two or three young people could be hired as interns each summer.

It must be remembered that promising young people will want to progress at a fairly rapid pace. Therefore, the transit firm must not keep them at menial tasks for long periods of time. If the firm fails to challenge the abilities of promising young people, it runs a serious risk of losing them.

Advertising. Advertising includes everything from ads in local papers, which have a wide general readership within

an urban area, to notices in trade journals, which have a limited but highly selective audience. Ads in the trade journals will probably be much more effective because they reach more people who are interested in transit management positions. An ad should give a clear description of the position to be filled and of the qualifications of the person desired to fill it. Resumes should be requested. After examining the replies, the best of the group can be invited for a a visit.

Employment agencies. Employment agencies are another source of applicants. Public agencies do not charge fees, but they usually have few listings of people in the managerial category. On the other hand, many private agencies specialize in finding management talent, but fees must be paid by the employer. When an agency finds a prospect, he is referred to the company for evaluation. From that point on, the particular company is responsible for accepting or rejecting the applicant.

Employees of the firm. Employees often have friends or former classmates who might be interested in working for the company. Care should be taken when hiring friends of current employees to avoid the development of cliques, which might work against the best interests of the company.

Professional transit management firms. A transit board of directors trying to find managerial talent may wish to contact one of the professional transit management firms. Such firms supply management service under contract to public agencies. In addition to on-site, professional management personnel, the management company also supplies the services of a central staff with specialized expertise in a variety of transit areas. This approach may be the best one for a transit property that needs staff help, but cannot afford an in-house staff. The professional transit management firms advertise their service in Passenger Transport, Mass Transit, Bus Rider, and other trade publications.



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The numbers in parentheses are NTIS order numbers.





## APPENDIX 4A

### PLANNING

Planning should be underway continuously in a transit organization. Planning enables a property to "define and evaluate the procedures required to reach our stated objectives and assign these procedures to individuals or organizational units as definite responsibilities" [4, p. 61]. More simply, planning must be undertaken because change is inherent in the future, and the firm must attempt to foresee and adapt to change.

In general, planning can be divided into long-range and short-range planning. The dividing line is not definite. One year is often considered the dividing point, but one source uses 5 years as the minimum for long-range planning [3, p. 6]. Short-run planning includes everything from next week to the dividing point.

#### Long-range Planning

In the long run, planning is intertwined with the goals of the company. In some cases, long-range planning is thought of as laying out basic company strategy. It can be estimating the long-range results of current decisions [2, p. 523-24]. Plans should be revised often, because the planning process is more important than individual plans.

The basic structure of long-range planning is shown in Figure 4A.1. The inside progression, from environment analysis through objectives, is oriented around a business starting from scratch, but it may encompass an existing business venturing into a somewhat different line. For example, a transit firm may have been running only scheduled service, but it now has the opportunity to obtain charter rights. First, the environment is examined to see what possibilities there are for the use of charter rights. From the findings, basic assumptions can be made, such as that local charter business is going to an intercity firm. The company's current posture is examined to see if it has or can get the resources, the sales contacts and other items, necessary for charter business. This examination reveals

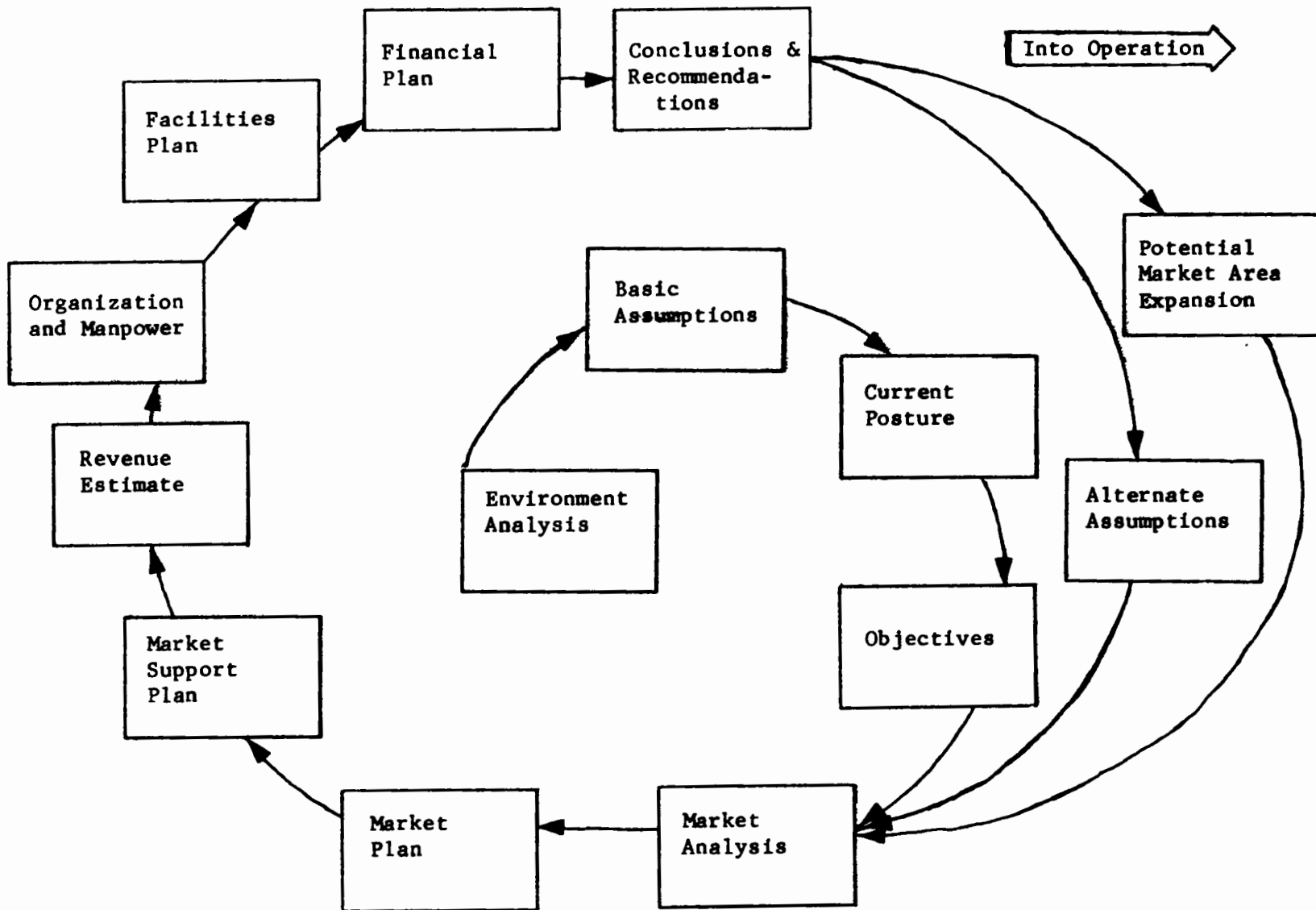


FIGURE 4A.1 Outline of long-range planning.

Adapted from William H. Newman, Charles E. Summer, E. Kirby Warren, The Process of Management, (Englewood Cliffs, New Jersey: Prentice-Hall, Inc. 1967), p. 526.

objectives as to how soon the business should be entered (if it should), what allocation of resources will be made, and other items. This process leads to the outer circle.

For firms in operation, the outer circle becomes a continuous reevaluation process. The company must reevaluate to remain competitive in a changing environment (customers, technology, resources, and so forth).

With the same example in mind, charter operations can be examined on the outer circle after the decision to go ahead has been made. Whereas the inside parts were very general, the outside of the circle deals in specifics. A careful analysis of the charter market is performed. From this, the marketing plan is devised, delineating how much business will be sought, what areas look the most profitable, and other items. In support, it must be determined what items are necessary in the company. A revenue estimate is made from these plans. The operational plans are made up. They include how charters will be worked into the organization, where the necessary manpower will be obtained and trained, what new buses or other facilities are needed, and what financing is needed and where it will be obtained.

These operational plans are costed out, and the final evaluation is made. If everything is favorable, the plans are put into operation. If unfavorable factors appear, some alternate assumptions can possibly be made that will increase the likelihood of a successful venture (such as limiting charters to off-peak hours to utilize otherwise idle equipment). The analysis may show such a positive balance that an even wider scope of activity might be attempted.

### Short-range Planning

Short-range plans are of a more specific nature. They emanate from the long-range planning that has been established, and thereby yield a strategy for conducting business. In setting up an operating plan, three important elements involved are listed below.

#### Organizational Evaluation

The current conditions in the organization must be evaluated in light of the long-range plan that has been established. All relevant variables are included—financial, physical facilities, human resources, and others.

Data collection and analysis. Information has to be obtained. Some can be obtained free, and some must be sought out. Internal data must be generated and a system set up to facilitate this effort. The city planning

department can be a source, but it never has all the data the planners want.

Organizational hierarchy. The planning of the organization is organized into a hierarchy (see Figure 4A.2). Plans for the organization as a whole are made at the top. Plans for various areas operate within the overall plan. Plans for specific operations in these areas are in tune with the area plans, and so on down the hierarchy. The more specific plans do not contradict those above [1, p. 73-85].

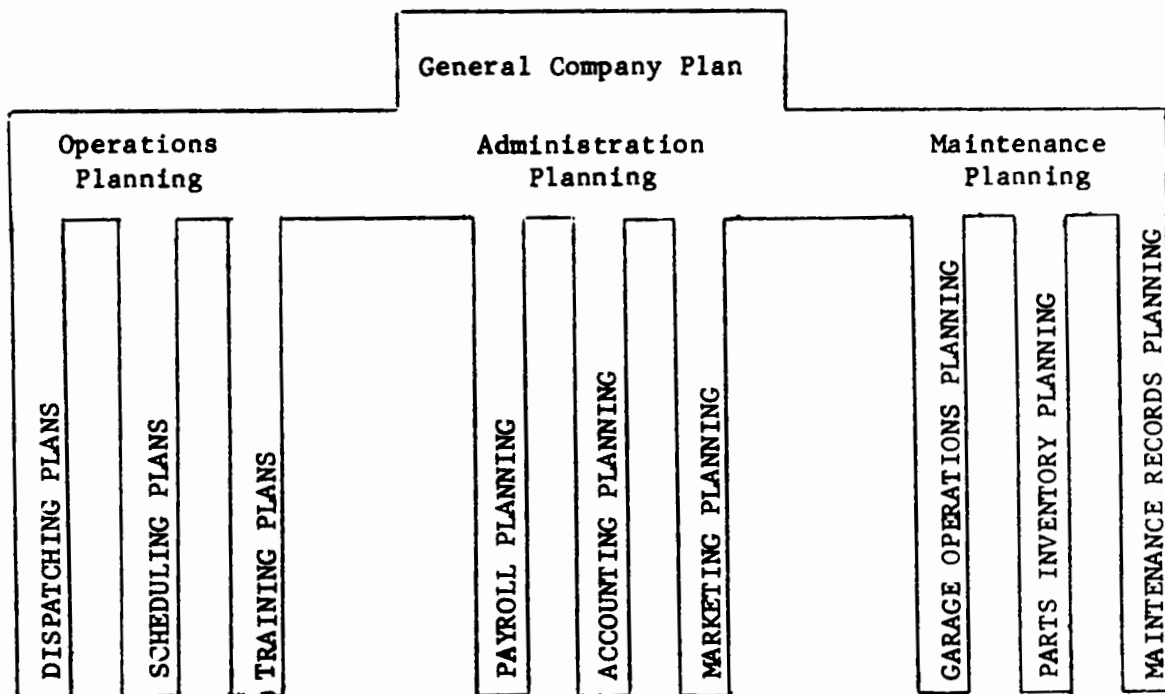


FIGURE 4A.2 Planning hierarchy.

### Standing Plans

This is another type of plan used in the short run. This type of plan includes policies, standard methods, and standard operating procedures that are designed to deal with recurring problems [2, p. 487]. An example would be a rule to use all the 1972 buses on routes, filling out with 1965 buses, and using the 1960 buses only when all others are busy. Then, when a dispatcher has to call a bus to replace a malfunctioning one, he knows which to use.

### Project Plans

This planning is undertaken with some specific objective in mind, such as building a new garage or erecting shelters at transfer points. It includes data relevant to the single project. It attempts to lay out the methods and schedules for attaining the objective. During implementation of the schedule, close watch is kept on how it is working, and any necessary changes are made.

The transit operator, in contrast to most other private firms, should be involved in planning with the local government. The nature of the business requires this involvement since the transit business runs in the city on city property and serves the city's changing needs. Because the city itself attempts to guide its growth and change, and the transit operation both effects change and is affected by it, the city and the transit operation must do some cooperative planning.

Working closely with the local urban planning bodies offers definite advantages. One is information, which is discussed elsewhere. Another is that the operator can more easily cope with planners' programs if he knows about them in advance, rather than after they are put into effect. Finally, the operator can sway planners' opinions on ideas much more easily when things are in the development stage than after they have been formulated.

Cooperation with the public planning body also should aid relations between the city and the transit body, showing a willingness on the part of the transit body to become involved in the city. It also is becoming more prudent in view of the fact that a prerequisite for most federal assistance grants is the operation of a permanent planning body and its approval of plans for any money received.

Sources for Appendix 4A

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The numbers in parentheses are NTIS order numbers.

## CHAPTER 5

### ACCOUNTING

#### Introduction

The basic objectives of an accounting information system in any type of business organization are:

1. To collect, organize, compare, report, and interpret various kinds of data that are of value to their users, especially management.
2. To meet legal record keeping and reporting requirements.
3. To provide concise, understandable data upon which decisions can be made.
4. To provide an internal control mechanism for protecting assets and preventing loss through fraud or error.

The major purpose of this chapter is to present ideas that will assist managers in setting up and operating an efficient information system. Much of the data collected is designed to meet the information needs of management; however, meeting the federal reporting requirements of UMTA also is important. One such current federal reporting requirement is that of section 15 of the Urban Mass Transportation Act of 1964, as amended. This section of the Act requires that all public transit operators that serve an urbanized area of 50,000 or greater population and who receive federal operating assistance report certain financial and nonfinancial information in a uniform manner to continue receiving federal operating assistance. This requirement often is referred to as "Project FARE" (Financial Accounting and Reporting Elements). Project FARE has different levels of reporting requirements that are dictated by the number of vehicles (and vehicle modes) operated by a given transportation property.

In the small transit property that has 10 buses or fewer, the general manager has close day-to-day contact with

all phases of the business. His need for information in report form is minimal; the quantity of data is small, and manual procedures for collecting and reporting data usually will suffice. As a matter of economics, a full-time bookkeeper cannot be justified. Therefore, either a professional bookkeeping service should be used, or an employee having other duties (such as secretarial or dispatching) can collect and record data.

In the larger properties, within the limits set for this project (fewer than 101 vehicles), formal information requirements increase because the general manager is further removed from day-to-day operations. The volume of data is such that mechanical and/or electronic aids for the information system can be justified economically.

Before a system can be designed, management must decide what information it needs.

### Information Needs and Requirements

#### Control of Operations

Spending more for better planning and control is cheaper in the long run than operating with no controls or poor controls. The major criterion for information in the control of operations is that the information must be pertinent to the decisions for which each person is responsible. If the information does not meet this criterion, it should not be collected.

To make rational decisions concerning routes and schedules, management needs several pieces of information. Information on the profitability of the route is necessary; revenue and out-of-pocket operating costs should be identified by route. Information on the origin and destination of current and prospective passengers is very useful and should include the number, time of day, and day of the week.

The purpose of a transit system is to provide transit service to the community. This goal cannot be achieved if a system has problems keeping its vehicles operating efficiently. For this reason, an efficiently run maintenance and repair program is necessary. Managing a successful maintenance and repair program requires keeping good maintenance and repair records and an up-to-date inventory of parts.

Preparing a budget to use in comparison with actual operating results is an effective way of controlling performance. Most states require that a budget be filed annually by public agencies. This budget is a good start in developing a control mechanism. Probably the best source of



information used in the preparation of a budget is past operating results. However, the budget should never be made by looking only at the past. The most recent results (usually documented by reports and statements) can be taken and adjusted for anticipated changes in fares, number of passengers, labor wages and benefits, cost of parts and supplies, new routes and schedules, and new sources of business. Areas where systems can improve their efficiency also should be examined more closely when preparing a budget. Otherwise it is very easy to become stagnant by looking only at the past and failing to search for ways to cut costs in the future.

To make adjustments in the budget, management needs to know what revenue and/or expenses will change, and by how much. Some studies show that drivers' wages and bonuses and fuel costs tend to vary according to total platform hours, whereas costs of tires, tubes, grease, oil, servicing, and repairing vary by total route-miles. The information system should be designed to collect these statistics. Budget adjustments also must take into account the timing and anticipated cost of wage adjustments because of cost of living increases for personnel covered by collective bargaining agreements, as well as the expiration date of the contracts.

#### Information for Outside Groups

Stockholders and other ownership groups. For privately owned properties, management must report to the owners at least annually on the financial condition and results of operations. If the management owns the property, this information still is needed. Therefore, balance sheets, income statements, and statements of changes in financial position (increases or decreases in working capital) need to be prepared at least annually and preferably monthly.

The transit authority or city government (or department thereof) requires similar reports. It also will require a budget for the following fiscal year so that the necessary tax support can be determined and levied.

Creditors. Prospective creditors often will request a cash forecast showing the timing and size of all cash receipts and disbursements, including repayment of the prospective loan. They usually will want periodic financial statements immediately preceding the granting of the loan and at least annually thereafter until paid.

Regulatory agencies. In addition to meeting federal record keeping requirements, many states also have accepted Project FARE as an acceptable accounting system when reporting to state agencies. If a transit system is located in a state that does not accept Project FARE for reporting,

it will have to be able to convert easily from one reporting system to another, or keep two separate sets of records. States also may require a transit system to file an annual budget. These budgets will most likely follow the form prescribed by the state, so a transit system should keep its records in a manner that allows it to prepare a good budget easily.

Taxing authorities. The main information requirement of taxing authorities is that revenue and expenses be reported in a manner that clearly reflects income. This income can be computed by using a cash receipts and disbursements method, with proper allowance for capitalizing and depreciating fixed assets, or by using accrual accounting, where income and expenses are recorded when earned and incurred, rather than when the cash transaction takes place. In a small transit company, the difference in results between these methods is likely to be small. Adequate records must be maintained to support the tax returns in case they are audited by the taxing authority.

### Accounting and Cost Control Systems

#### Ledgerless Bookkeeping

A very small property (with 10 buses or fewer) can handle its accounting operations solely through the use of documents upon which each transaction is recorded, without resorting to journals or ledgers. It only needs a typewriter, an adding machine, and a coin counter. This system is known as ledgerless bookkeeping. In principle, it is used by establishments of all sizes. If journals and ledgers are used, it is only because the number of documents handled is so large that it becomes expedient to list them for storage of data or for better control and summary. When mechanical and electronic equipment are used, it is only to do the same work more rapidly and, possibly, more accurately.

In ledgerless bookkeeping, a form is completed when a transaction takes place, giving all of the essential facts. One or more samples of the completed form are provided at the outset to facilitate the accounting work.

Purchases and cash disbursements. The purchase of parts on account is recorded on a purchase order and purchase invoice (see Figure 5.1). The original copy of the purchase order usually is required by the vendor or a purchase order number to be followed by the actual form. When the parts have been received and the purchase invoice has been verified and approved for payment, the original invoice and a copy of the purchase order are filed to serve as a record of the liability to the vendor (accounts payable). The invoice also is a record of increase in

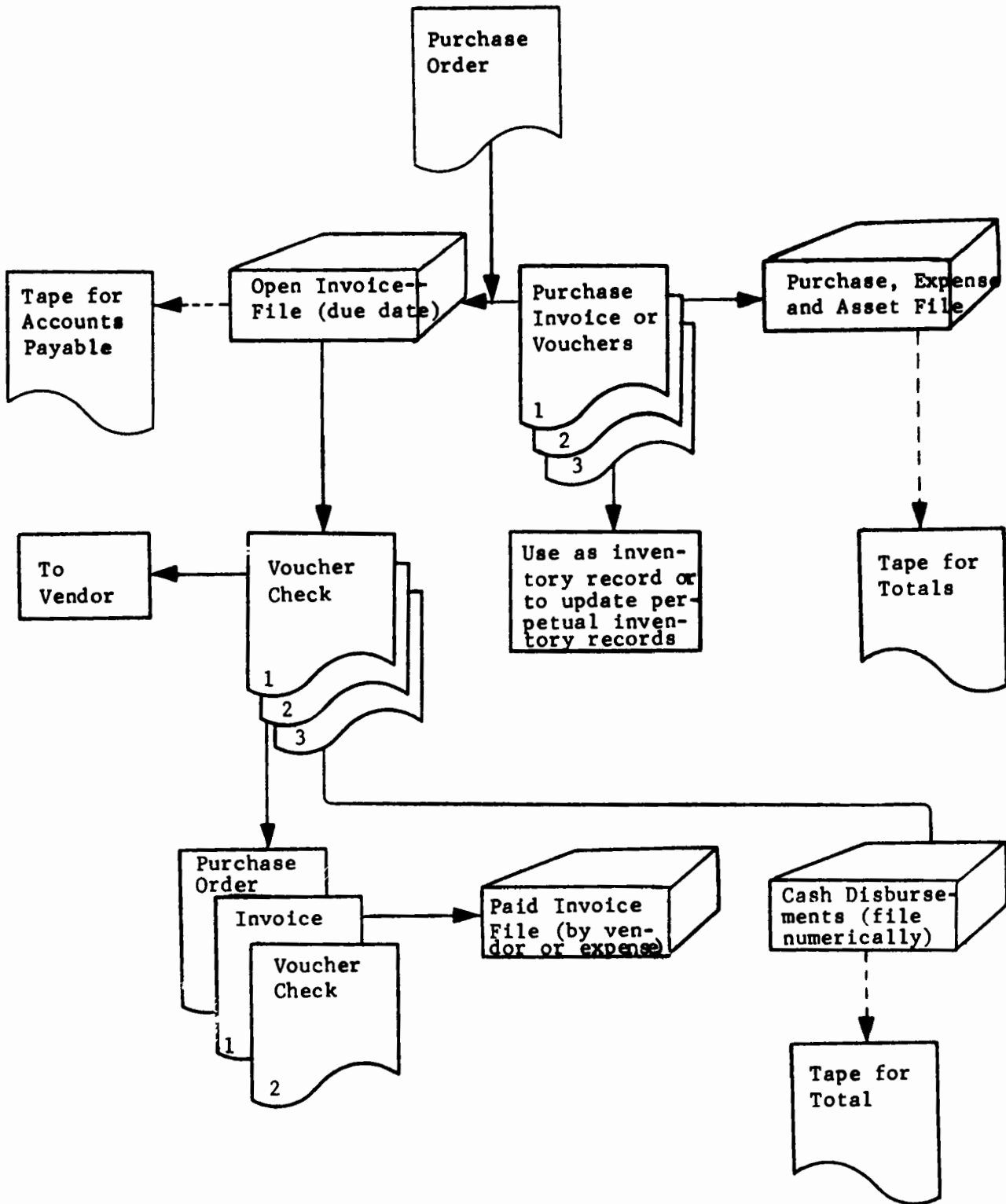


FIGURE 5.1 Ledgerless bookkeeping--purchases and cash disbursements.

assets or expense depending upon whether the part is used immediately or placed in inventory (current asset). A duplicate of the invoice is filed, to serve as a record of the purchase. A triplicate of the invoice can be used as the inventory record or, preferably, to update the perpetual inventory record. As additional purchases are made, additional invoices join the first on a spindle or in a file, to build up a cumulative record of each fact that is important to management--the amount of accounts payable, cost of purchases during a given period, and the current inventory status.

The invoice is verified in the following manner:

1. Comparing the description and the unit price with the purchase order.
2. Comparing the quantity with the purchase order and amount actually received, which should be noted on the purchase order and initialed by the person receiving the merchandise. (This can be accomplished by verifying the package slip and attaching it to the purchase order.)
3. Checking the extensions, footings, and cash discounts to make sure they are correct.

Often, it is difficult to get suppliers of essential services and products to furnish invoices in more than one copy. This problem can be solved in one of two ways: (1) a copier machine can be used to make copies of the original invoice, and these can be handled as outlined above, or (2) vouchers can be prepared from each invoice showing the invoice date and number, supplier and due date, item(s) purchased, and amount. The invoice can be used as the original above with vouchers serving as the second and third copies for the purchases and inventory update purposes.

Not all invoices will be for the purchase of parts. In these cases, the appropriate expense, fixed or current asset, or other special file, will receive the invoice or voucher copy.

The disbursement of cash is recorded by a disbursement voucher and check (see Figure 5.2). The voucher and check are prepared in triplicate at the time of payment, whether for merchandise, other asset purchases, other liabilities, or expenses such as salaries or supplies. The original is mailed, preferably in window envelopes, or given to the payee after being signed. One copy is placed with the invoice and purchase order in a new file, as the record of the payment of the liability or of the expense. The other copy is filed as the record of the disbursement of cash.

BLOOMINGTON TRANSIT AUTHORITY  
 809 East Ninth Street  
 Bloomington, Indiana 47401

To: Second National Bank  
 Bloomington, Indiana

50-367  
 215

No.

Pay \*\*\*\*\*Forty-Eight and 51/100\*\*\*\*\*

February 28, 1970 \$48.51  
 Date

To The Order Of

┌  
 XYZ Supply Company  
 2461 North Meridian Street  
 Indianapolis, Indiana 46208  
 └

\_\_\_\_\_  
 Authorized Signature

0215 0367 430 249 222 5

-----  
 REMITTANCE STATEMENT

Balance Forward	Reference or Description	Payment Date	Invoice Amount	Discount	Balance	Reg. No.
---	Inv. 9542	2/28	16.50		16.50	84-7
16.50	Inv. 9872	2/28	33.00		49.50	89-18
			49.50	.99	48.51	
			Invoices	Discount	Check Amount	

BTA

Check Register Copy

File Copy

FIGURE 5.2 Voucher check.

The total of accounts payable is found by adding the unpaid original invoices in the open invoice file, which is maintained in due date order and, for each due date, in alphabetical order by vendor name. The total of purchases and other expenses is found by adding the total of the duplicate invoices in the respective files. These totals are updated by adding new invoices to the previous totals. For this purpose, an adding machine can be used, and the tapes can be attached to the invoices or the front of their file folder. The result is the same as that accomplished by electronic data processing, punched card accounting, bookkeeping machines, or hand entry in journals with hand posting to subsidiary ledgers and a general ledger.

To facilitate the cash disbursing activities, it is preferable to pay all invoices that allow cash discounts at regular intervals so that discounts are not lost. By taking advantage of special discount terms, purchasers can make substantial savings. For example, paying an invoice discounted by 2% within 10 days, rather than paying the whole balance within 30 days, is equivalent to earning 36% interest on the money spent. Invoices without discount terms can be paid one or two times during the month when other activities are slack. All invoices from one supplier can be grouped together in one check.

Sales, accounts receivable, and cash receipts. The rendering of services on account is recorded by preparing a sales invoice on a preprinted form (see Figure 5.3). The original is sent to the customer as his bill. One carbon copy is filed as the record of accounts receivable. Another copy is filed as the record of sales. A third copy serves to update stock records, if necessary.

The receipt of cash on account is documented by a check and, perhaps, a remittance advice--either the bottom part of the check, which is torn off, or a part of the sales invoice returned with the payment. The advice should be attached to the sales invoice and put in the closed receivable file. If there is no advice, the envelope, which usually has the return address on it, can be used as the advice by entering the date, check number and amount of the check. In any case, the amount received is recorded on the daily cash receipts report (see Figure 5.4).

The daily report of cash count for route receipts and ticket sales serves as the daily cash receipts report that is filed as the record of cash receipts and daily operating report. The total of the daily report should agree with the daily cash deposit. A copy of the report, preferably with the receipts on account blocked out, is filed in the sales file as the record of cash sales and is used to prepare the daily operating report.

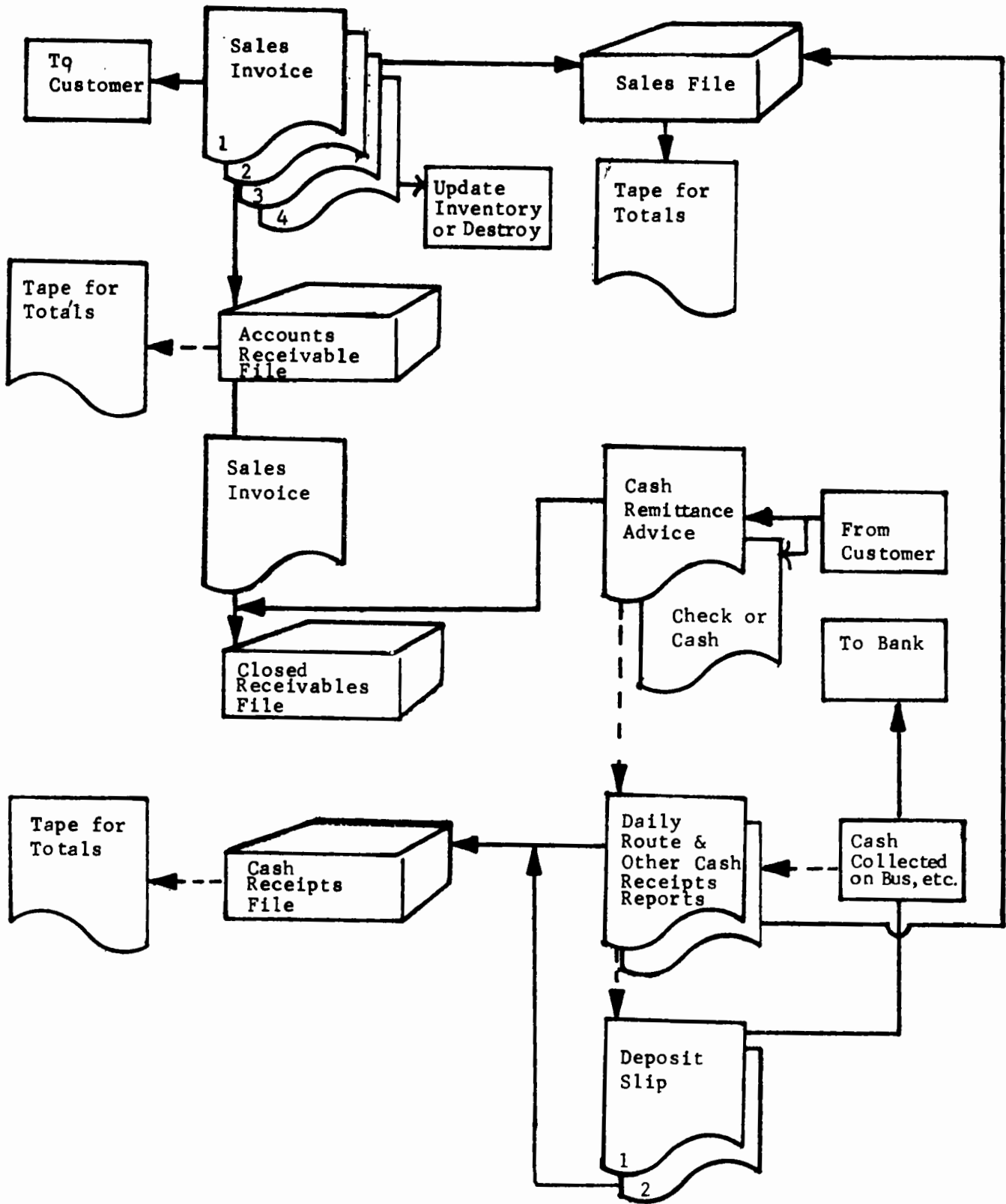


FIGURE 5.3 Ledgerless bookkeeping--sales, accounts receivable, and cash receipts.

0                    0                    0                    0                    0						
<b>DAILY CASH RECEIPTS AND OPERATING REPORT</b>						
Date <u>    </u> / <u>    </u> / <u>    </u>						
Bus No.	Box No.	Route	Cash Count	Route	Passengers	Revenue
101				1		
102				2		
103				3		
104				4		
105				5		
106				6		
107				7		
108				8		
109				9		
110				10		
112						
113						
114						
115						
<b>Total</b>						
<b>Other Receipts:</b>						
<b>Total Cash Received</b>						
<b>Total Mileage</b> _____ <b>Total Hours</b> _____ <b>Weather</b> _____ <b>Events</b> _____						

FIGURE 5.4 Daily Cash Receipts and Operating Report.



Other transactions. Other miscellaneous transactions and end-of-period adjustments can be recorded on journal vouchers (see Figure 5.5), which, after approval, also are filed and used in conjunction with the total from all other documents in the preparation of periodic statements. For example, depreciation expense can be recorded on journal vouchers. The original is filed with the fixed asset records and the duplicate in the current expense file.

Journal Voucher No. <u>5</u>		Date <u>12 / 31 / 69</u>	
5021	Depreciation of revenue equipment	9600	00
2501	Allowance for depreciation of revenue equipment		9600 00
(To charge expense with depreciation of buses 5101, 5102, 5103, and 5104, costs \$20,000 at 8% for the year 1969.)			
Prepared by	Entered by	Approved by	

FIGURE 5.5 Journal voucher.

Management information is available to owners or managers directly from the documents with a minimum of accounting work, as shown below.

<u>Information</u>	<u>Source</u>
Products on order	File copies of unfilled orders. (As orders are filled, copies are transferred to a permanent file.)
Accounts payable	Unpaid invoices and expense bills. (As paid, they are transferred to a paid file or are returned to vendors.)

Purchases--day, week, month, year	Copies of purchase invoices, whether paid or unpaid. (Adding machine tapes keep total updated.)
Expenses, including wages	Copies of check vouchers, unpaid expense bills, and payroll data (updated by adding machine tapes).
Cash disbursements	Copies of check vouchers, punched and kept in post binder (updated by adding machine tapes).
Accounts receivable	Copies of sales invoices not yet collected. (As collected, they are transferred to a permanant file or are given to the customer as a receipt.)
Revenue--day, week, month, year	Copies of cash count reports and billing copies, whether or not collected (updated by adding machine tapes).
Parts on hand	Perpetual record prepared from copies of purchase invoices, sales invoices, and materials requisitions (supplemented by physical inventory).
Cash receipts	Copies of remittance advices, cash count reports, receipts copies, and deposit slips (updated by adding machine tape).
Cash balance	Cash on hand plus reconciled bank balance (or beginning balance plus receipts minus disbursements).

The usual bookkeeping operations of recording transactions in journals and of posting to subsidiary and general ledgers require rewriting the same information several times. First, the original record of the transaction is written up as an invoice, a voucher, a check, a note, or some other document. Second, the information required in the journal is copied from the invoice or other

document. Third, the information required in the ledgers is copied from the journal or from the original document. In each case, considerable bookkeeping time is required, and there is a chance of error. Small businesses often find that many bookkeeping operations can be eliminated by using a ledgerless system as described in the preceding paragraphs.

Documents prepared on forms can be controlled effectively by prenumbering. The most familiar example of document control is the procedure used to control checks. Checks are prenumbered, or at least they are numbered consecutively as used. Voucher stubs or duplicate copies of checks and vouchers are often provided, all having the same numbers as the corresponding checks. When checks are issued, a record by number is provided; when canceled, checks are returned by banks and accounted for by number; and finally, the canceled checks are filed according to number. The purpose in checks is, namely, to safeguard property, to motivate the efficiency of employees, and to maximize the accuracy of the resulting accounting information.

#### Use of Accounts and Records

The ledgerless system is recommended only for very small properties. In larger properties, where the general manager is not involved in every activity and where the amount of data is large, management will require more written information than that provided by a ledgerless system. Also federal reporting requirements can be met best by maintaining records according to the prescribed system.

Write-it-once applications. The most efficient manual payroll system is the "write-it-once" system, with which the payroll check, earnings statement, payroll summary, and individual earnings records can be prepared at one time with proper alignment of documents and use of carbon paper or, preferably, noncarbon paper. The equipment is simple and can be obtained from several sources, along with the necessary forms. The largest suppliers of these items are McBee Automated Business Systems and Shaw-Walker, who claim they are used by companies with 5 to 2,500 employees. The method is probably most efficient for companies with fewer than 100 employees.

The payroll summary sheets can be used to determine total labor costs and liabilities for withholdings, and a duplicate of the check can be used as the record of cash disbursements in a ledgerless system. Where journals and ledgers are used, the summary is the source for posting to the general ledger. The individual earnings record is a permanent record in which calendar year earnings of employees are accumulated for proper determination of state

and federal withholdings, FICA and unemployment taxes, and for statements reporting annual earnings and taxes required by law.

The basic source of information is the employee's time card and/or time sheet approved by his supervisor at the end of the pay week. Pay rates are recorded on the employee's earnings record, as are special withholdings, such as union dues, insurance, and savings plans. Taxes are taken from special withholding tables, which can be obtained from almost any office supply firm.

Computerized payroll. Banks now have cheap, computerized services for payroll. Set-up charges usually run \$300 or more, but the cost per check is very low, and taxes and other deductions are computed automatically. It more than pays for itself in bookkeeping time for a system with more than 20 employees. Two checks are written, one for net payroll, the other for the FIT/FICA deposit. Banks will pay the Internal Revenue Service for you.

Check and cash disbursement journal. For properties that require the use of a cash disbursements journal, both Snaw-Walker and McBee have combination systems that can be used for both disbursements and payroll, using one check form for both purposes (see figure 5.6). With one writing, the check and the cash disbursements journal are prepared. The beauty of this type of system is that several documents can be prepared without transcribing figures, an advantage that eliminates many errors. The set-up costs of this combined system run as low as \$125. This sum includes the writing board, a large supply of checks, earnings cards and disbursements journal paper, and binders for the cards and journals.

Summary strip accounting pegboard. A device that can be used to combine detailed reports into a summary report and to help eliminate errors is a pegboard (see Figure 5.7). The pegboard consists of a board with an adjustable metal groove on the left side, in which the line guide travels; an L-shaped guide; a removable peg strip, in which round pegs are spaced at intervals; and a slotted metal tube that holds the peg strips rigidly in place. The line guide operates much like the T-square used for making structural drawings. It can be used to combine daily reports into weekly reports, weekly into monthly, and monthly into yearly. Shingled reports are in a form so that the board itself may be submitted to management in lieu of written reports requiring further typing or recopying. In this way, comparative detail can be scanned without extensive record preparation.

The pegboard can be used to combine operating reports, passenger count reports (by route), financial statements, revenue reports, mileage reports, and so forth.

**CASH DISBURSEMENTS JOURNAL**

FORM NO. 2  
MONTH September 1970

GENERAL LEDGER	50	51	5A	110	111	112	113	114	220	221	CHECK NUMBER	CITY	STATE	DATE	NAME	AMOUNT	INITIALS
	2450			12010	27050	9600	66710	31340	10260	32501	11800				FORWARDED		
											1361			9-10-70	FORWARDED		
											1362			9-10-70	Master's Ave		
											1363						
											1364						
											1365						
											1366						
											1367						
											1368						
											1369						
											1370						
											1371						
											1372						
											1373						

**CASH DISBURSEMENTS JOURNAL**

**EMPLOYEE PAY STATEMENT and CHECK**

**INDIVIDUAL EMPLOYEE EARNINGS RECORD**

NAME LAWRENCE P. MCCARTHY ADDRESS 1747 W. SENECA AVE. BRADFORD

DOB SEC NO 143-20-4435 YEAR 1970

TELEPHONE 744-1367 AREA 3

YOUR COMPANY NAME NO. 1375

YOUR BANK NAME

PAY 14500 DOLLARS

TO THE ORDER OF Lawrence P. McCarthy

YOUR COMPANY NAME

COB80-0345C 107-305-7656P

DATE	DEPOSITS	WITHHELD	BALANCE	DATE	DEPOSITS	WITHHELD	BALANCE
7-10	Forwarded		590000				
7-11		73350	522710				
7-12	156075		678785				

FIGURE 5.6 Combined check and cash disbursement journal.



An illustration in the use of the pegboard system may be helpful. First, daily revenue by route can be recorded on a strip. Weekly summaries can be prepared by placing the daily reports in shingle fashion on the pegboard, with a blank form on the right side. Using the line guide, the weekly totals per route can be determined, adding the daily figures together. The line guide concentrates attention on the correct line, thus reducing the chance of error. This set of daily reports and the weekly totals can be left on the board and given to the manager for review. The same process can be used to combine weekly reports into monthly summaries and monthly reports into annual summaries. Companies such as Shaw-Walker will design the forms and make the necessary hardware for this kind of system.

Unit analyzer system. A device similar to a pegboard is a McBee Unit Analysis system, designed for presenting comparative and cumulative management reports (see Figure 5.8). This system uses a special looseleaf binder and forms for unit reports such as monthly or quarterly income statements. It is designed mainly for presentation and storage of reports rather than their preparation.

#### Federal Reporting Requirements: Project FARE

UMTA's Project FARE is a reporting system developed to meet the requirements of the UMTA Act of 1964, as amended by section 15. The Act provides that UMTA may approve section 5 grants only if applicants (transportation systems) have met the requirements of section 15. The goal of Project FARE is to collect financial and operating data of mass transit systems by uniform categories and to report such data in a uniform system of accounts and records.

#### Mode Classification

Transit systems are initially classified according to the mode(s) of transit service operated. The modes included are trolleybus, streetcar, motor bus, dial-a-ride, school bus, ferryboat, other, and multimode. Multimode includes any transit system which operates two or more modes. Any multimodal system will have to report expense data for each mode.

Transit systems also are classified by size according to section 15:

- \*\* Level A: More than 500 revenue vehicles (about 20 systems nationally).
- \*\* Level B: Between 101 and 500 revenue vehicles (about 50 systems nationally).

0								0								0							
MONTH 1/70	MONTH 2/70	MONTH 3/70	MONTH 4/70	MONTH 5/70	MONTH 6/70	MONTH 7/70	MONTH 8/69	MONTH 8/70			INCOME STATEMENT <sup>1</sup> TO DATE 8/70			TO DATE 8/69	TO DATE 9/69	TO DATE 10/69	TO DATE 11/69	TO DATE 12/69					
ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	BUDGET	DIFF.	ACTUAL	BUDGET	DIFF.	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL					
											REVENUE												
											Route Revenue												
											Other Revenue												
											Total Revenue												
											MAINTENANCE												
											Repairs:												
											Material												
											Labor												
											Accident												
											Total Repairs												
											Servicing:												
											Lubrication												
											Washing & Cleaning												
											Outside Servicing												
											Fueling & Parking												
											Total Servicing												
											Tires & Tubes												
											Supervision												
											Other Maint. Exp.												
											Total Maint. Exp.												
											TRANSPORTATION												
											Drivers Wages												
											Fuel												
											Supervision												
											Other Trans. Exp.												
											Total Trans. Exp.												
											OTHER EXPENSES												
											Traffic & Advert.												
											Insurance												
											General & Admin.												
											Depreciation												
											Taxes & Licenses												
											Other												
											Income Taxes												
											Total Oper. Exp.												
											NET INCOME (LOSS)												
											Operating Ratio												
											Revenue Passengers												
											Route Miles												
											Platform Hours												
											Mile-Route Rev.												
											-Maint.												
											Per Hour-Trans.												

1. Detail can be altered to fit needs of each property

FIGURE 5.8 Comparative income statement using unit analyzer system.



**\*\* Level C: Fewer than 101 revenue vehicles (about 800 systems nationally).**

Transit properties are only required to report in Level C detail, regardless of size. Nonetheless, systems are encouraged to report at the suggested levels. Because this book is intended for transit systems with fewer than 101 vehicles and because Level C is the only required reporting level, the rest of the discussion of Project FARE will be based on the Level C reporting requirements. These requirements are:

1. Cover letter of certification (CPA or authorized official).
2. Form 300--balance sheet summary schedule.
3. Form 310--capital subsidiary schedule (2 pages).
4. Form 400R--revenue summary schedule.
5. Form 410--revenue subsidiary schedule (2 pages).
6. Form 500R--expenses and functions schedule.
7. Form 510--operators wages subsidiary schedule.
8. Form 520--fringe benefits subsidiary schedule.
9. Form 593--pension plan questionnaire.
10. Form 600--weekday time period schedule.
11. Form 610--transit way descriptors schedule.
12. Form 620--revenue vehicles inventory schedule.
13. Form 630--transit service personnel schedule.
14. Form 635--transit system employee count schedule.
15. Form 640--revenue vehicle maintenance performance measures schedule.
16. Form 641--energy consumption schedule.
17. Form 645--accidents schedule.
18. Form 650--transit service supplied schedule.

For Form 500R, there is one form for single-mode providers, another form for multi-mode providers. Forms 510, 520, and 593 are not required for systems operating 25 revenue vehicles or fewer.

### Reporting Categories

The next step in analyzing Project FARE is to divide the data into categories. In Project FARE, data is reported in the following major segments:

1. Balance sheet.
2. Revenue report.
3. Expense report.
4. Nonfinancial operating data reports.
5. Miscellaneous auxiliary questionnaire.

Definitions are an integral part of a standardized system of accounts and records. Each of the major segments has many items that must be reported exactly as the regulations prescribe. Some of Project FARE's definitions may be different (e.g., Project FARE's definition of cash may not be the same as a transit system's definition of cash), so it is important that FARE's definitions are understood and followed. A copy of the regulations containing the definitions can be purchased from UMTA.

### General Requirements

The four general requirements of section 15 are:

1. Each transit system will report results of its fiscal year. Reports are due 120 days after the close of that fiscal year. Systems that use a calendar year ending December 31, must have the Project FARE system in place by January 1, 1978, and must submit the first report to UMTA by April 30, 1979.
2. Reports must be made on the accrual basis of accounting. Systems that use cash-basis accounting, must convert their figures to the accrual basis.
3. Each system must be audited by an independent public accountant or certified by an independent governmental audit agency. The accountant or agency must sign a letter or report attesting the system's conformity with Project FARE's regulations.

4. Systems are not required to maintain records and accounts exactly as prescribed by Project FARE. However, records should be kept in a manner that permits ready preparation of the required financial and operating FARE reports.

#### Cost of Implementation

Systems having one-time conversion costs will be eligible for funding from section 5 funds. Systems not eligible for section 5 funds may be eligible for funding by section 3 funds, if UMTA approves.

As with all federal programs or requirements, it is best to check regularly for the latest information with the UMTA regional office.

#### Managerial Controls

##### Acquiring Inventory

A perpetual inventory system is very useful in running a successful maintenance program. It can help eliminate shortages of important parts and help to protect the inventory from theft.

One problem with a perpetual inventory system is that, in time, it usually becomes slightly inaccurate. Therefore, it is necessary that a physical count of each item in the inventory be done periodically. A count should be taken at least at the end of each operating year, to ensure that the inventory is stated correctly on the balance sheet. Other counts can be taken more frequently to make sure there is a sufficient number of critical parts available and to control possible pilferage. The remainder of this section describes how a good inventory system can be set up and run.

Requesting new stock parts. A designated employee should complete a parts wanted form and present it to the superintendent of maintenance for his signature. The parts wanted form then is sent to the controller, who will see that the part is ordered and that proper records for the new part are started. The information needed includes: (1) part number, (2) name of the part, (3) number required, and (4) name of the vendor.

Requisitioning parts. Three steps are followed when parts are requisitioned by the shop:

1. The bookkeeper records the requisition or repair order number, quantity issued and returned, and the date on the inventory stock card.

2. The bookkeeper then subtracts the quantity requisitioned from the number in stock to get the new number in stock.
3. The number left in stock is compared to the reorder quantity. The reorder quantity is an inventory level that allows for "safety stock." (The "safety stock" is the number of parts that will last until a new shipment of the part arrives.) The reorder quantity can be either a set quantity or the difference between the amount left in the inventory and the maximum number to be carried in stock. If the reorder quantity is greater, an order is placed for more parts. Parts with a unit cost of less than \$1 can be ordered whenever it is seen that they are running low. If possible, items costing \$1 or less should be charged to avoid unnecessary bookkeeping.

Ordering stock parts. The following procedures are used in ordering parts:

1. A purchase order form is filled out in triplicate by the controller or bookkeeper, upon requisition from the maintenance supervisor. The original goes to the vendor. One copy goes to the storeroom, and another is kept by the controller or bookkeeper.
2. For new parts, a stock card is made for each inventory item valued more than \$1 per unit. Information required on the stock cards is: (1) part number, (2) part name, (3) amount ordered, (4) date, (5) purchase order number, (6) the name of vendor, (7) reorder point, and (8) the reorder quantity.
3. For new stock parts, a bin tag is made and sent to the storeroom so provisions can be made for storing the part when received.

The requisitioning and ordering inventory control process is shown in Figure 5.9.

### Receiving Stock Parts

Storeroom procedures. The following procedures are completed in the storeroom when parts are received:

1. If the order received is complete, the purchase order should be initialed by storeroom personnel and sent with the packing list to the controller or bookkeeper.

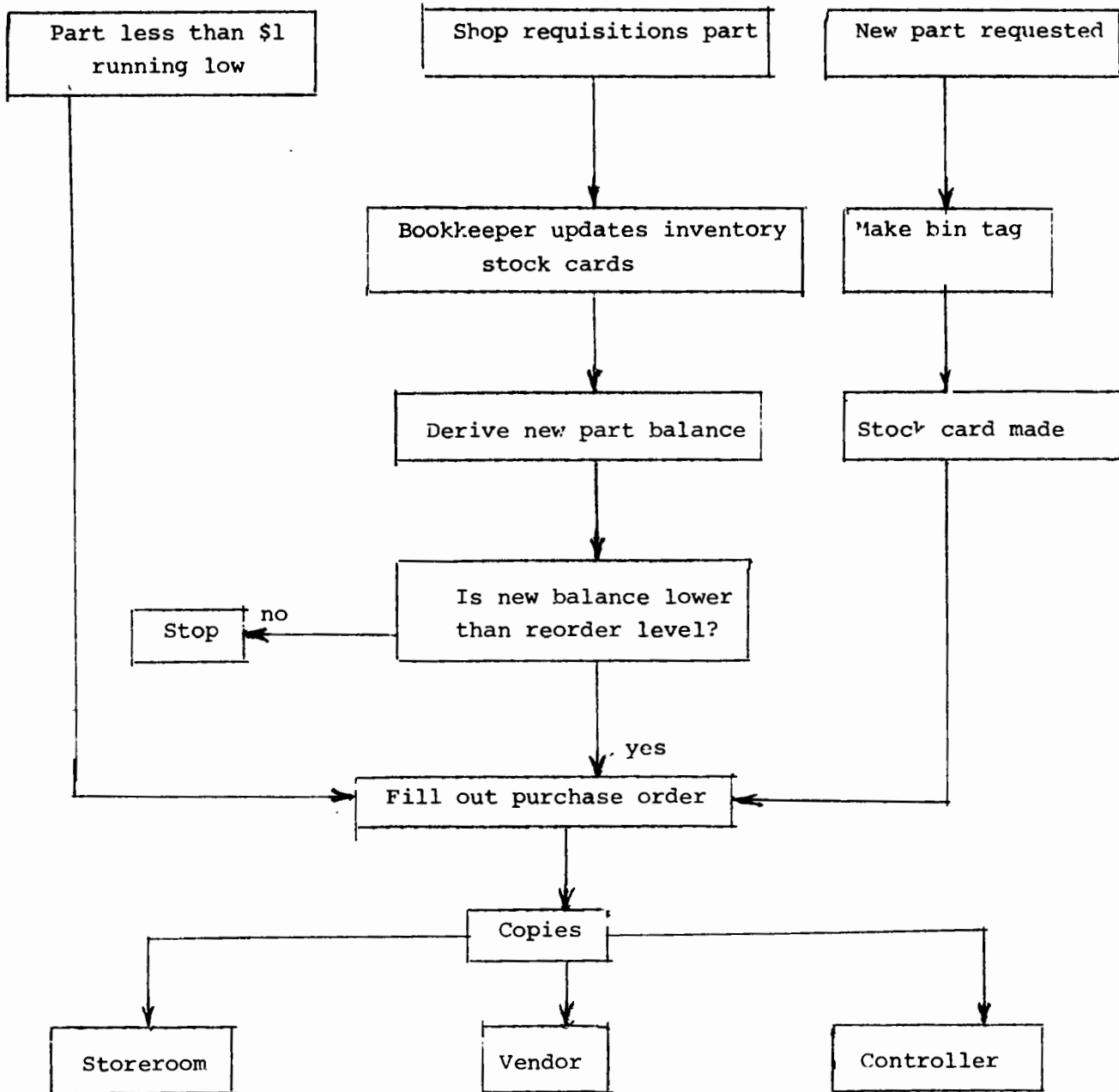


FIGURE 5.9 Requisitioning and ordering: inventory control process.

2. If the order is not complete, the purchase order is kept until all of the parts have been received. A receiving sheet should be filled out and sent to the controller's office. Information contained in the receiving sheet should be: (1) the purchase order number, (2) the part name and number, and (3) the quantity.

Procedures in the controller's office. Five procedures are followed by the controller:

1. When the packing slip or the receiving sheet is received, the quantity and date should be recorded on the stock card.
2. When the invoice is received, cost per unit should be posted to the stock card.
3. The invoice should be checked against the receiving report or the packing slip for accuracy.
4. If the invoice is accurate, it should be approved for payment.
5. The invoice should be filed with the packing slip or receiving sheet and, when complete, with the controller's copy of the purchase order.

The recording procedures for inventory received is shown in Figure 5.10.

#### Maintenance and Repair Information

Payroll costs are the major cost of any transit system, followed by the cost of maintaining and repairing revenue vehicles--fuel, oil, grease, parts, tires, and batteries. Because maintenance and repair costs are a significant portion of operating expenses, it is extremely important to develop a system of proper control over these activities.

The first step in implementing an improved maintenance control system is to design a form to record mileage (preferably hubodometer mileage) and fuel, oil, and engine coolant consumption (see Figure 5.11).

At the end of each operating day, a designated employee should complete the daily vehicle report and forward it to the bookkeeper. The bookkeeper then will:

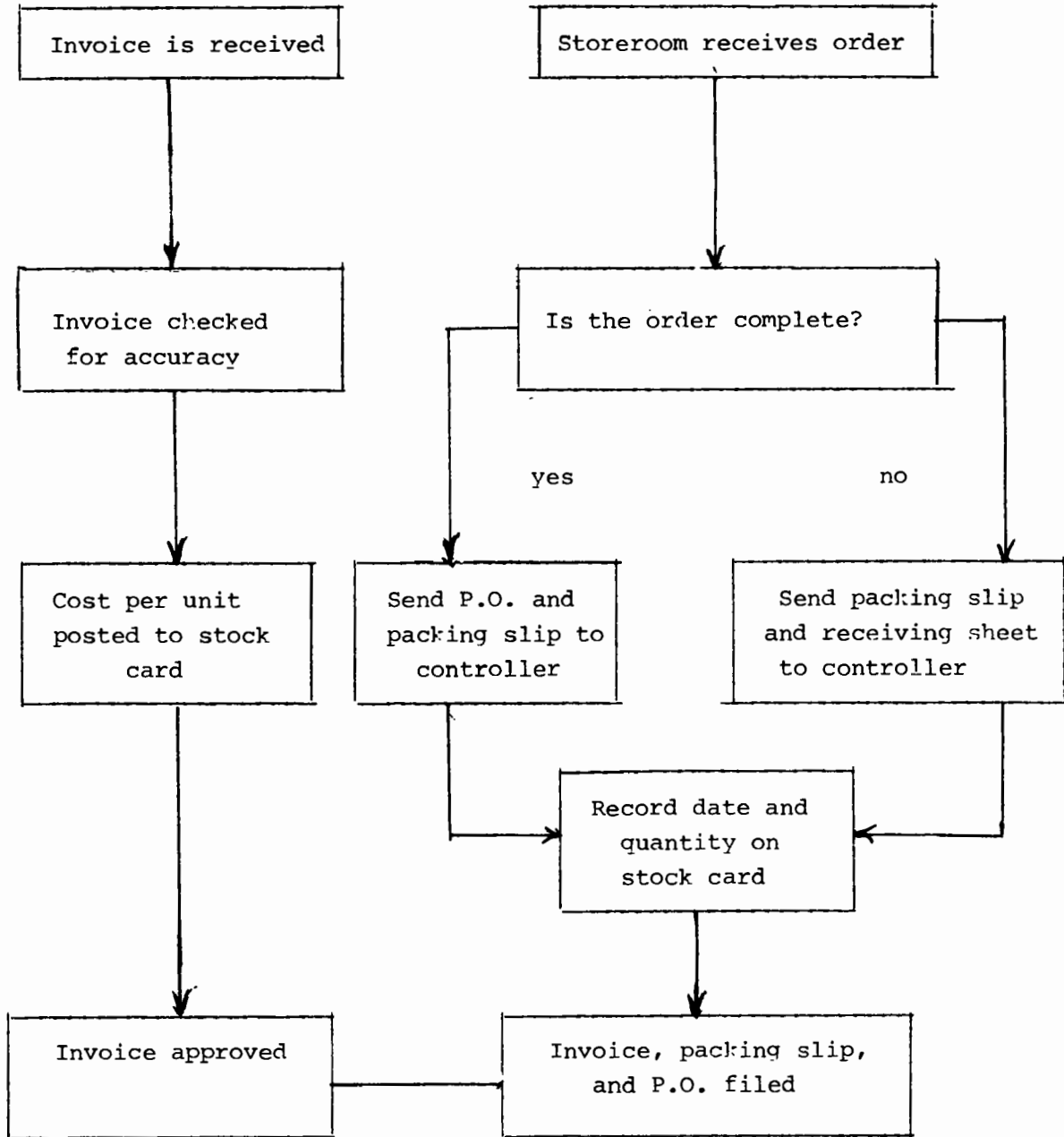


FIGURE 5.10 Inventory received: recording process.





1. Record the expenses in the accounts. Fuel, oil, and coolant are expensed when used and must be recorded at least monthly for accounting purposes.
2. Make the daily operating reports for management's use. Reports should be designed for marketing, operations, finance and maintenance.
3. Calculate consumption of fuel, oil, and coolant per mile to determine which vehicles are not performing well. These calculations should be made at least on a monthly basis and recorded on a standardized form (see Figure 5.12).
4. Update the preventive maintenance card (Figure 5.13) and compare the new mileage to the predetermined check points on the preventive maintenance card to see if any preventive maintenance is needed. When work is needed, the bookkeeper should send a notice to the garage. When the work is complete, the garage should send notification to the bookkeeper that the scheduled maintenance has been performed. To lessen some of the work required to run its maintenance record system, the bookkeeper could go out to the garage once a day to complete the preventive maintenance card, or someone in the garage could be responsible for completing it. This process is shown in Figure 5.14.

After reviewing the bus defect cards and the preventive maintenance card, the maintenance supervisor issues orders. A description of the work to be done is given on a prenumbered repair order form (see Figure 5.15). Parts and labor costs can be given on the repair order or on separate documents used for more extensive information and controls. Using the forms with all the cost information on one form is more useful, because it gives total direct costs on one sheet. The repair form is executed in triplicate: one copy is used for updating inventory records and bus repair history (can be preventive maintenance card); the second copy is used by the bookkeeper for posting to the accounts; the third copy is filed numerically to be sure that all repair orders are accounted for. For a visual representation of the process see Figure 5.16.

#### Electronic Data Collection Aids

Service bureaus and computer-time sharing. Many businesses, city governments, and banks have computers that are not used fully. They often try to use the excess time by providing services for others at a fee. In some communities, special businesses known as service bureaus are available. In both cases, small businesses are given the opportunity to have certain bookkeeping and reporting



LUBRICATION AND PREVENTIVE MAINTENANCE CHART			Time Interval								
			Hours	8	50	100	200	300	500	1,000	2,000
Item	Operation	Miles	Daily	240	1,500	3,000	6,000	9,000	15,000	30,000	60,000
1.	Engine Oil		X								
2.	Oil Filter*										
3.	Coolant and Filter		X						X	X	
4.	Hoses								X		
5.	Radiator									X	
6.	Heat Exchanger Electrodes and Core								X	X	
7.	Raw Water Pump		X								
8.	Fuel Tank		X						X		
9.	Fuel Strainer and Filter		X					X			
10.	Air Cleaners			X					X		
11.	Air Box Drains									X	
12.	Ventilating System									X	
13.	Blower Screen									X	
14.	Starting Motor*										
15.	Battery Charging Generator					X	X		X		X
16.	Battery					X					
17.	Tachometer Drive					X					
18.	Throttle and Clutch Controls						X				
19.	Engine Tune-Up*										
20.	Drive Belts						X				
21.	Overspeed Governor								X		
22.	Fan Hub Bearings*										
23.	Shut-Down System							X			
24.	Hydrostarter System*										
25.	Air Compressor Air Strainer						X				
26.	Turbacharger*										
27.	Power Generator					X		X			
28.	Power Take-Off			X	X				X		
29.	Torqmatic Converter		X		X				X	X	
30.	Torqmatic Marine Gear		X				X				
31.	Paragon Marine Gear		X				X				
32.	Reduction Gear (Single Engine)			X	X				X	X	
33.	Reduction Gear (Multiple Industrial)		X							X	
34.	Reduction Gear (Multiple Marine)		X				X				
35.	Transmission (Railcar)		X							X	
36.	Oil Filter (Railcar)*										

FIGURE 5.13 Preventive maintenance card.

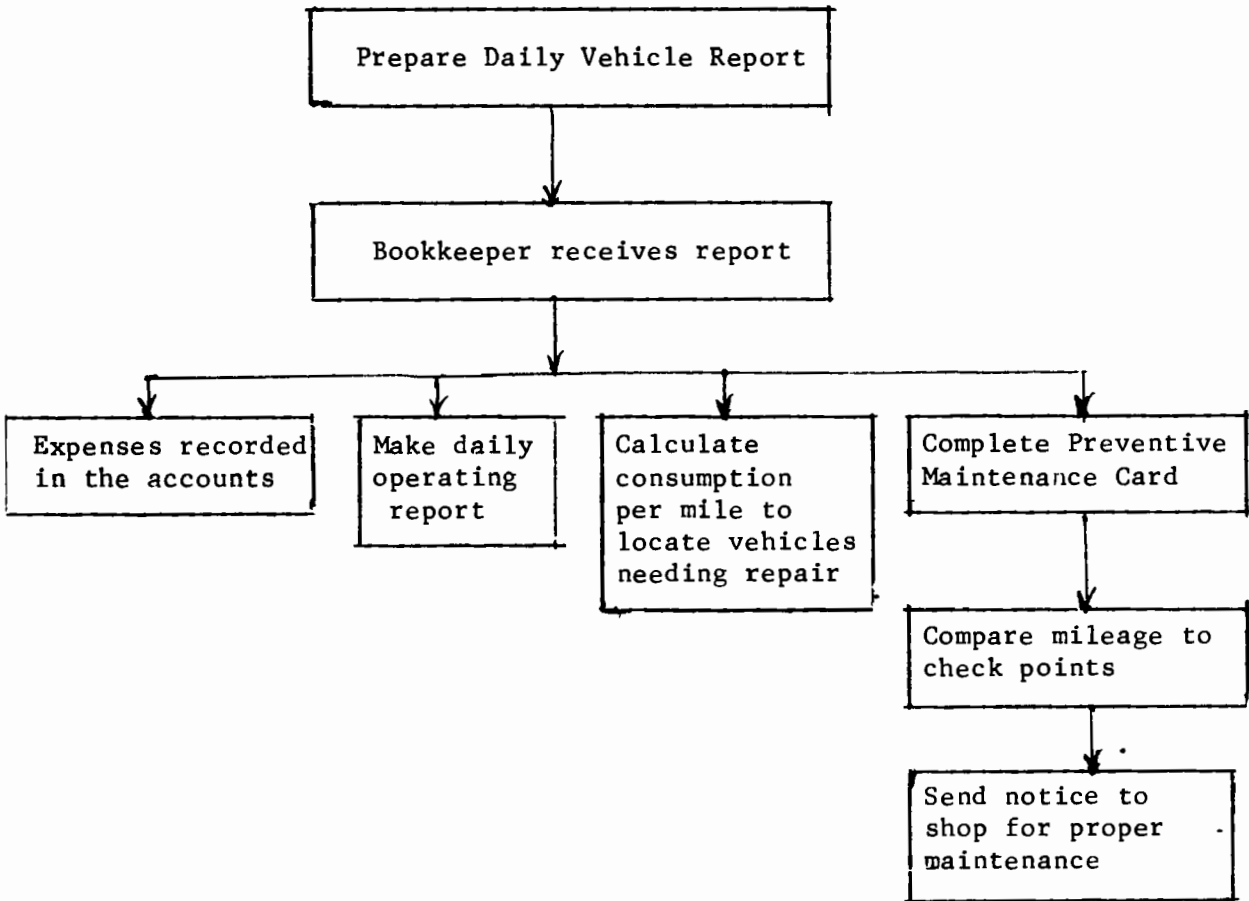


FIGURE 5.14 Preventive maintenance recording procedure.



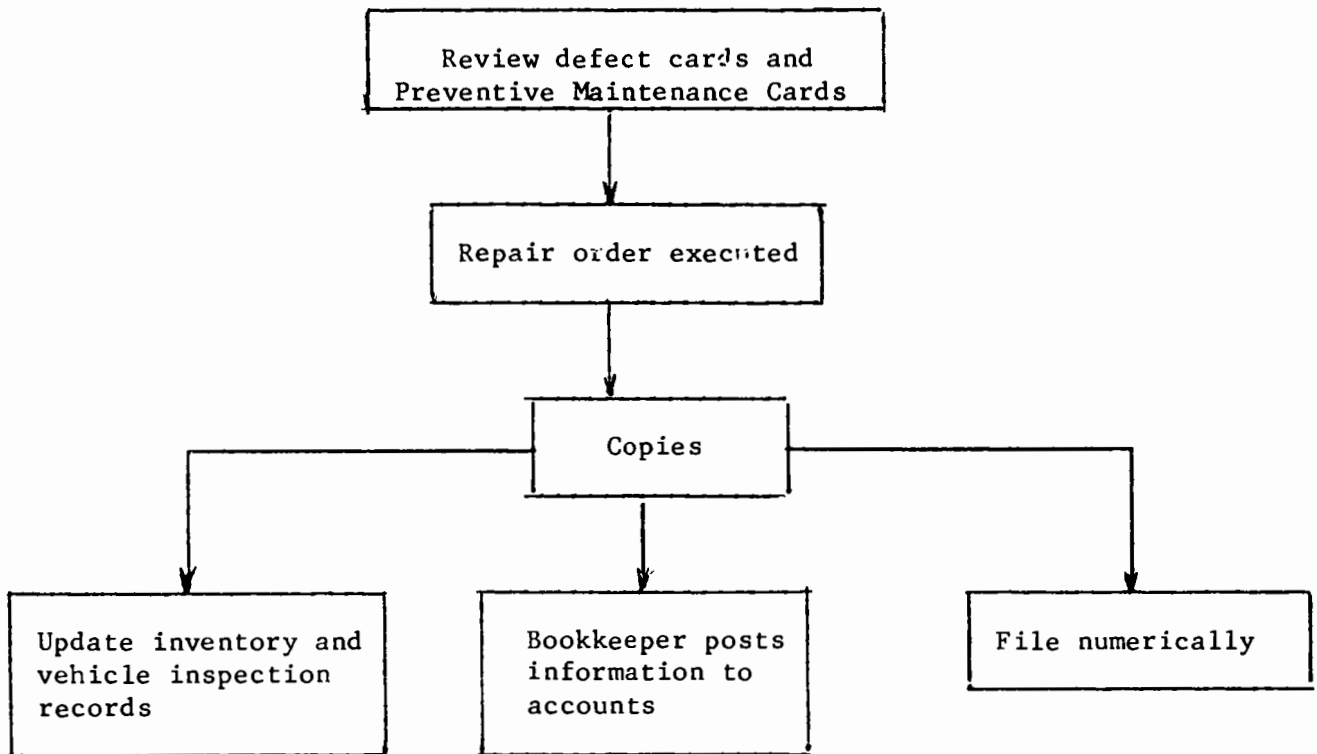


FIGURE 5.16 Maintenance: Repair recording procedure.

performed on a computer, without having to invest in the equipment. Payrolls can be processed by providing hours worked and a listing of pay rate changes and withholding changes. Data are punched into cards or onto tape, which, when fed into the computer, will prepare payroll checks, earnings summaries, and cumulative earnings information. Other data can be processed, such as passenger route revenue and mileage information, resulting in various summaries and operating reports.

Service bureaus often do a lot of payroll work and normally will have a procedure and computer program available for this type of work. If special work is to be done, such as preparation of daily operating reports or a report of maintenance and repair cost by vehicle, special computer programs will have to be written, which would add to the initial cost of using a bureau. The special program can be used for a long period of time, however, so that the overall costs will not be increased greatly.

Many small city transit companies currently are using similar services provided by local banks. Not only do they aid in data processing, they also tend to solidify the property's relationship with the bank, a relationship that may be useful for future financial needs.

Computer systems. It is possible, and perhaps prudent, for transit systems to investigate the use of automated control systems. The MITRE Corporation, under contract with UMTA, has developed a number of computer programs that can be obtained and used by transit properties without the individual properties incurring development expenses. All of the systems make data collection easier than in a manual system. By computerizing the operations, cumbersome manual records are replaced by reports that are easy to generate and read. Information that was once thought difficult to accumulate and correlate is quite simple to gather and use for management decisions.

Early indications show that Run Cutting and Scheduling (RUCUS) is an excellent program for starting a sound data base and also the proper first step toward other computer applications. Although RUCUS was designed primarily as a run cutting and scheduling device, it has been found that up to 50% of its use is for storing data. This program could be used to generate the required nonfinancial data required under Project FARE quickly and easily and would be a good start for including the accounting data of Project FARE on the computer.

The Service, Inventory, and Maintenance System (SIMS) is a computer-based information system designed to assist management in its control of maintenance performed on urban transit bus fleets.

SIMS is divided into three interrelated modules. The service/unit module is used to develop an active history of each bus operated by a transit property. Information about each bus is updated daily (fuel and oil used, coolant added, and miles traveled). The service module shows the consumption of oil and coolant and identifies the buses that are using abnormal amounts of these commodities.

The inventory module is used to maintain inventory records and help management make decisions pertaining to inventory (as discussed in the inventory section of this chapter). Stockroom supplies are monitored through the use of the inventory module.

The repair cost module monitors labor and materials used for the entire fleet, as well as for the individual vehicles in a property. This module provides cost data for vehicles individually and by divisions, and monitors the cost of vandalism repairs.

In a region or a state where there are several properties, a central computer operation could be set up to service data processing needs. Each property could have direct access to the computer through the use of data phones, teletype equipment, or special input/output cathode ray tubes (CRTs), which will provide an immediate picture of the information asked for. By using this arrangement, a system can split the costs of computer operations with a number of other systems, and eliminate many of the problems associated with running a computer operation.

#### Routes and Schedules

The basic inputs of information concerning routes and schedules are:

1. Daily report of miles operated per route.
2. Daily report of revenue per route.
3. Report of missed trips.
4. Platform hours per route.

Section 15 requirements. Section 15 requires the following breakdown: revenue vehicle miles + charter miles + school miles = total miles.

Additional inputs for more sophisticated route and schedule information are:



1. Studies to determine average fare per route.
2. Studies of sources and destination of current and prospective passengers.
3. Route revenue during peak and base periods.
4. Passengers per trip route, by time of day.

Mileage. The route mileage report normally will be prepared by the dispatcher either from (1) book mileage, adjusted for deviation, or (2) a report of odometer or hubodometer readings taken from the daily vehicle report (Figure 5.11). The route mileage report is illustrated in Figure 5.17.

Revenue. The means of collecting route revenue information depends upon the type of fare boxes used. If registering fare boxes are used, readings can be taken as frequently during the day as information is desired. At a minimum, readings are necessary whenever a bus is put on a new route and when it is taken off, but no less frequently than at the end of each day. If peak and base period and/or per run revenue and/or passenger count information is desired, more frequent readings will be necessary. These readings can be recorded by the driver on his trip sheets. When counting the cash, it is not necessary to count each fare box separately, unless a double check is desired.

If nonregistering fare boxes are used, more effort is required to obtain the information than with a registering fare box. Minimum information is obtained by counting and recording data from each fare box separately at the end of each day. Any bus used on more than one route will require an allocation of revenues to the routes involved. Passenger and/or revenue information on a more detailed basis will have to be obtained in different ways, for instance, by riding checks or cross-section checks. If an exact fare system is used on the property, drivers can keep track of the number of passengers on each inbound and outbound trip either on a sample basis or on a regular basis, using a mechanical counter. This system would provide the information needed to determine revenue per route as well as peak and base ridership. Drivers also may keep a daily log sheet of the ridership (see Figure 5.18).

Travel patterns. Information on travel patterns of current customers can be collected through the use of questionnaires handed out and collected on board the vehicles. Questionnaires would be used only when management expresses a desire for specific information. Information on travel patterns of nonriders can be obtained through the use of door-to-door, mail, telephone, or newspaper





questionnaires, depending upon the resources available for the study. The door-to-door method probably is the best, but also is the most expensive. High school or college students could be used in obtaining a thorough coverage of the population at a minimum cost, especially if they were convinced that the study were worthwhile.

Information concerning schedule adherence is essential to proper management of transit companies, as running on schedule is one of the most important services the company can provide. The information can be collected in several ways:

1. Drivers can telephone the office at the end of each run.
2. Drivers can call the office on two-way radios whenever running late or at the end of each run.
3. The dispatcher can monitor the vehicles with an electronic monitoring system.
4. Street supervisors can check schedule adherence.
5. Special riders can check periodically on honesty, courtesy, and schedule maintenance of drivers. A special service must be used to collect information in this way.
6. Management can make its own checks on drivers and supervisors when they are out in the community during the day.
7. Company personnel can make cross-section checks; the vehicle number, time, direction, and passenger count of each vehicle passing a given intersection can be recorded on a sample basis.

For small city transit companies, it would seem that method 4 is the best means of collecting this information. Method 2 would seem to offer great possibilities for supervision and control, as well as information collection and reporting of emergencies. A system of this kind would provide close contact without the need for a large number of roving supervisory personnel.

### Personnel

Basic payroll information has been discussed earlier in this chapter. Additional information on personnel is useful. To provide information on employees' past performance for use in determining raises, promotions, and dismissals, it would be desirable to have a record of

training programs successfully completed, periodic evaluation by supervisors, driver accident records, records of physical exams and eye tests, file of complaints and commendations from customers, and information on experience acquired in previous or concurrent jobs.

Because these bits of information will come from various sources, they should be accumulated in a personnel folder for each employee. These records could be maintained in the general office or in the offices of the managers who are directly responsible for recommending raises and promotions.

The means of collecting the information will vary from company to company. A very good method is to have a special form printed right in the employee's folder for summarization. The important thing is that the data be collected and used.

In small companies, management often knows information about its employees without maintaining personnel folders. For larger companies, however, the folder can be a very useful tool when a dismissal must be supported to the union or when someone is to be promoted.

Other information should be included in this folder such as the employment application, job assignment, notices of pay-rate changes, and withholding authorizations.

1. Information should be confidential.
2. Discipline and compliments should be documented.
3. Good personnel files help in grievances, unemployment compensation, and so forth. Without disciplinary actions in writing (to employee and in file), you will probably lose grievances, arbitration, unemployment compensation, and so forth.
4. Good motivational programs, such as safety awards, absenteeism awards, should be included.

### Special Operations

This section deals with the unique information characteristics of special bus operations.

Sources of revenue information. For charter business, certain guidelines should be followed to maintain the flow of information:

1. Amount of payment should be agreed upon when charter is booked.
2. Payment should be recorded as revenue upon completion of charter and, if not yet collected, it should be billed and recorded as an account receivable.

Charter forms should provide the following information:

1. Chartering party.
2. Destination.
3. Price for hours/mileage/layover.
4. Special driver instructions.
5. Confirmation slip.
6. Cancellation notice provisions. The chartering party must cancel within a certain time before the trip, or be assessed a minimum charge of \$X. Otherwise, the bus company may end up paying overtime with nothing in return.
7. Terms for payment.

For school busing, two guidelines should be followed:

1. Contract should set the amount of payment.
2. Payments should be allocated to reporting periods based on ratio of time elapsed to total contract period and adjusted for any fluctuations in scope of performance required by contract, such as change in routes and/or number of buses during specified periods of time.

Driver time and costs. The time each driver worked should be identified separately on time reports. Driver time should be recorded on the charter report and, for school busing, if drivers are used for school busing as well as other driving, time should be recorded separately on time cards or dispatcher's assignment sheets.

Fuel, oil, tire, tube, and maintenance costs should be recorded in the following manner:

1. If special fleets of buses are used, procedures described previously will apply.
2. If regular-route buses are used, usually it will be desirable to allocate these costs based on platform hours and miles separately accumulated for the special business. The purpose is to provide information on the profitability of the special business.

UMTA requires a yearly cost study for special operations that includes all direct and indirect expenses. The special operation rates must be at least equal to the cost of operating the special service, as determined in the cost study.

### Cash Management

Cash is the easiest of all assets to have stolen. All money collected during the day, whether in fare boxes, in the mail, or over the counter, should be deposited daily. It is imperative that cash collected be inaccessible to anyone not authorized to handle it.

Fare box collection presents a special problem. Security procedures must be taken from the time the passenger boards the bus until the cash is deposited in the bank. Riders should be required to drop the coins into a locked fare box. Each evening the fare box vaults should be removed from the vehicles and placed in a secure storage vault or safe. The next morning an authorized employee should count the cash and tokens. To help make sure that the same amount of money is counted as is taken from the fare boxes, a second person could simultaneously count the cash and tokens or should watch the first person count. After the money is counted, it should be deposited in the bank by a person other than the one who counted it. The cash deposited is easily verified by the bank deposit receipt.

Disbursements of cash should be made only from an imprest petty cash fund or by check, rather than from cash collected during the day. An imprest fund is one that has at all times cash and/or disbursement vouchers equal to a certain fixed amount, such as \$100. Control over the receipts and disbursements is provided by creating documents to verify all cash transactions--deposit tickets for receipts and petty cash vouchers and checks for disbursements.

If drivers are required to make change, they should be given the minimum amount required, a coin holder for making change, and a locked box to carry and store the money in when they are not driving. Drivers should be accountable

for the full amount at the start of each day. Management should spot check periodically. Only enough money to make change for one day should be given to each driver. The money should not be left on the premises because each driver is responsible for the money he signed for. If the cash is left on the premises and is stolen, it is his word against everybody else's, although the money may have been present during a spot check.

Whenever a transit system has excess cash, the cash should not be left in the checking account. The excess cash should be placed in an interest-earning account where it can generate additional revenue. The first task is to decide if the excess cash is a long-term or a short-term situation. A temporary cash surplus should be deposited in safe, short-term investments, such as United States Treasury notes and savings accounts. Long-term excess cash should be invested in improvements of property or used to retire any long-term debt.

## Management Reports

### Budget Reports

The importance of making a budget was stressed earlier in this chapter. However, a budget's usefulness should not end with its drafting. A budget can be used as a management tool throughout the year to determine how close actual expenses and revenue are to planned expenses and revenues. A budget status report, showing the amount of each budget category that has been spent, can be made after each month and is a tremendous aid to management. The budget status report enables management to see easily where the organization is doing better or worse than expected and should cause management to investigate the reason for the discrepancy. Other useful comparisons can be made when a system uses budget reports. For instance, comparisons with the previous month, the same month one year prior, or the year-to-date total from the previous year can be very enlightening to management.

### Daily Operating Report

The daily cash receipts and operating report is prepared from the cash counts and daily mileage/platform hour report (see Figures 5.4 and 5.17). Passenger counts checked against fare box revenue, also are useful. Entry of weather and information on special events affecting revenue, such as special conventions, football games, school closings, and so forth, are helpful in comparing current reports with previous reports.



### Weekly Operating Report

The weekly operating report is prepared by combining route information from daily operating reports (weather, revenue, events) with daily mileage/platform hour reports, preferably by using the pegboard system described above (see figure 5.19). These reports can be prepared on a daily basis, if desired.

### Monthly Route Report

Information for the monthly route report comes mainly from the weekly operating report, with the aid of the pegboard (see Figure 5.20). Variable costs are allocated to routes in the following manner:

<u>Variable</u>	<u>Allocation</u>
Driver's wages and bonuses	Platform hours
Fuel and fuel taxes	Platform hours
Tires and tubes	Route miles
Servicing labor, materials	Route miles
Grease and oil	Route miles
Repair labor and parts	Route miles

The contribution profit (or loss) is revenue less variable costs. It gives a good indication of the profitability of each route. These reports can be varied to meet the needs of management.

### Income Statement

Information for the income statement comes from the purchases, expense and revenue files (in the ledgerless system), or ledgers (where journals and ledgers are used). Total revenue and variable costs should agree with the Monthly Route Report totals.

### Summary of Reports

The flow chart in Figure 5.21 shows the relationships among several of the reports discussed in this chapter.

0                    0                    0                    0                    C                    0 <b>WEEKLY OPERATING REPORT</b> For Week Ending _____ / ____ / ____							
Route #	Total Revenue	Revenue Passengers	Transfer Passengers	Miles	Revenue Per Mile	Platform Hours	Revenue Per Hour
1							
2							
3							
4							
5							
6							
Other							
<b>Total</b>							
General Weather _____							
Unusual Events _____							
Remarks: _____							

FIGURE 5.19 Weekly Operating Report.

0                      0                      0                      0                      0                      0

**MONTHLY ROUTE REPORT**  
For the Month Ended      /      /     

Route #	Route Miles	Platform Hours	Revenue		Variable Cost		Contribution Profit (Loss)	Passengers	
			Amt	Per Hr	Amt	Per Hr		Number	Per Hr
1									
2									
3									
4									
5									
6									
7									
8									
Other									
Total									

Remarks: \_\_\_\_\_

FIGURE 5.20 Monthly Route Report.

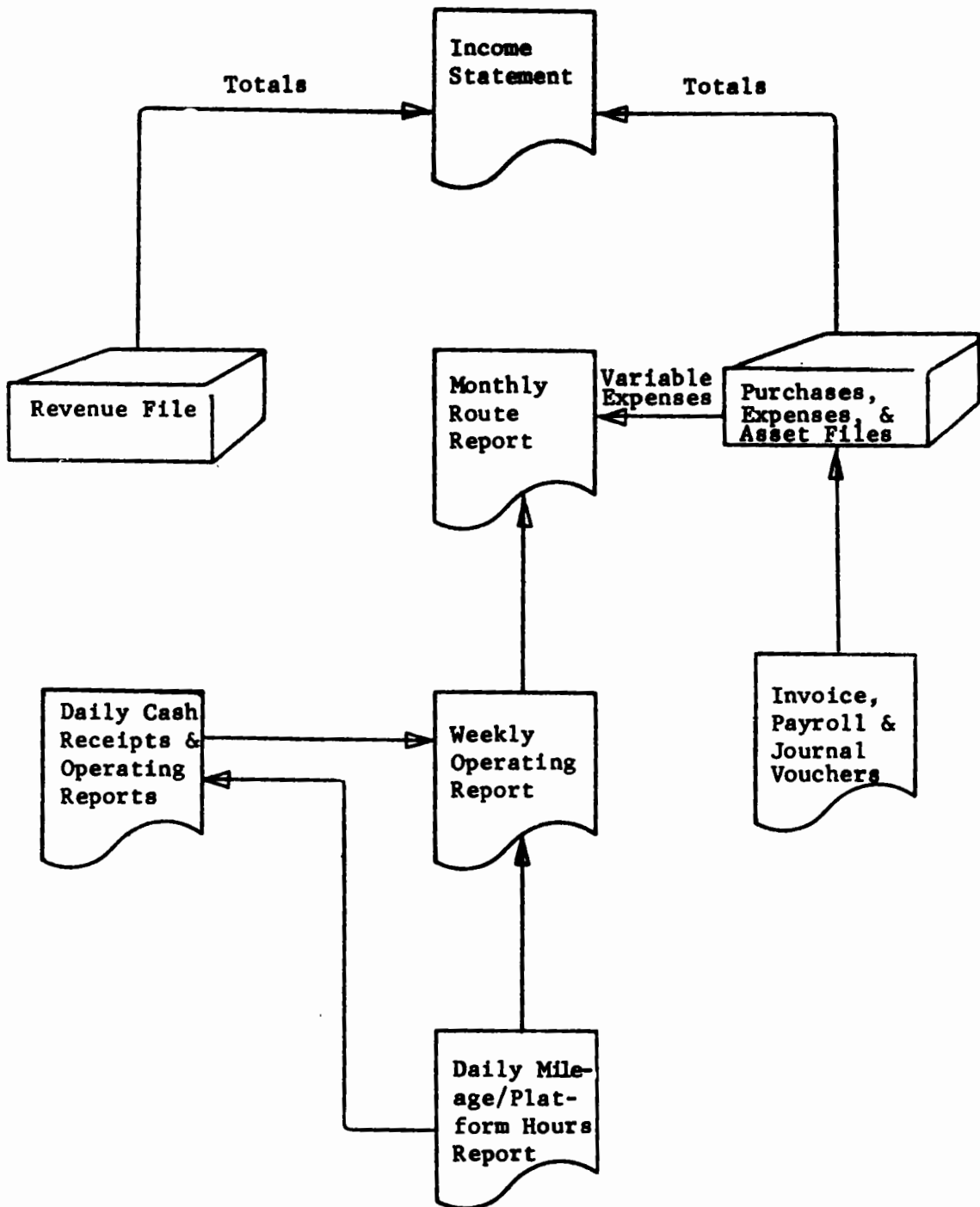


FIGURE 5.21 Summary of reporting relationships.

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The numbers in parentheses are NTIS order numbers.



MASS TRANSIT MANAGEMENT:  
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