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Mass Transit Management: A Handbook for Small Cities

Part 2: Management and Control

Third Edition
Revised
February 1988



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Part 2:

Management and Control

Third Edition, Revised
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INTRODUCTION TO THE THIRD 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, providing management training for the transit industry, and conducting management performance audits of transit properties has given IUT's staff substantial insight into transit management.

The consumer-oriented approach to business is strongly emphasized in this handbook. The consumer-oriented approach is the major business approach of American business firms. This marketing management technique has been in use 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 the transit industry has traditionally suffered from a lack of marketing expertise and effort. Today, the transit industry still is primarily operations-oriented but it is clear that, nationwide, 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 sections on 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 6-11) covers important areas of day-to-day operation, coordinated as the product element in the marketing mix. Part IV: Marketing (Chapters 12-15) deals with the marketing program and promotional activities.

Because this handbook is intended to serve more as a reference work than a textbook, care has been taken to produce chapters that are complete in and of themselves. Some repetition is inevitable when using this technique, but every effort has been made to reduce duplication by cross-referencing and 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.

The handbook aims to promote the concept of results-oriented management as well as marketing orientation. Early in this handbook, the need to establish goals and objectives is stressed. The concept of management by objectives (MBO) is discussed 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 Chapters 1 and 12. Chapter 1 discusses the goals and objectives of a transit enterprise. It covers consumer behavior as it may be applied to mass transportation and recommends the development of a general marketing-management strategy for transit management. In Chapter 12, the marketing program suggested for the small transit property is developed fully. The relationship between 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 with the costs carefully controlled and all aspects of the enterprise planned with specific ends in mind. The aim is to encourage, not a minimum of service at the lowest possible cost, but service that meets consumer needs and desires at a cost carefully calculated and controlled. The ideas and concepts are applicable to both private and publicly owned transit services. Most of the principal ideas are straight from the private sector.

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 were the first two editions. 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. In a world of fast-moving managerial and technical innovation, nothing stays up to date for more than two or three 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 to serve the urban traveling public effectively and efficiently. We also wish the very best to persons working in transit, a difficult but highly rewarding field of effort.

PART II

MANAGEMENT AND CONTROL

The consumer-oriented concept of management depends upon skilled managers, armed with the necessary information to take wise action. Therefore, Chapter 4 focuses on the functions and problems of transit management, the use of management by objectives (MBO), the difficulties to be expected, and the many management issues that arise. Guidelines to help avoid or solve problems are accompanied by guidelines on management selection. 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 and using information that management must have to run an enterprise effectively. In transit properties 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, including basic accounting information and other data. The information systems discussed 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 9 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 effort is to consider the most modern concepts of business management and adapt them to mass transportation.

The chapter starts with an examination of management strategy and the need for flexibility, and 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.

Strategies in Choosing a Management Style

So often, managers are characterized as having a "style" that influences their approach to the various problems and issues they deal with each day. Managers' effectiveness then becomes a function of how well their style successfully contributes to the improvement of the system. The appropriate application of a management style can mean the difference between a well-run transit system and a frustrating operating environment. Given the dynamic nature of the transit environment, the successful manager is likely to be the person who can recognize change and apply the appropriate style in dealing with it. There is no one style of management that can be expected to work successfully in every situation. The success of a transit manager can be measured on his ability to continually and accurately interpret the ups and downs of the environment, then compensate accordingly to maintain a smooth efficiency in the operation of the system.

Established goals and objectives, or the transit system's mission, are key determinants of the style that the transit

manager needs to adopt. If the operation of the system is in congruence with desires of the policymakers, then the manager may choose to delegate more responsibility to his staff, thereby furthering the development of those under him while freeing up more of his own time to work on strategies for the future. In the case of a new transit system, or a system that does not operate as efficiently as is desirable, the manager must take on a more short-term, results-oriented style. There is little room for error in these scenarios and it is likely that attitudes need to be developed, or changed. Therefore, it is better that the manager take on a style of delegating clear and manageable tasks designed to reach the point at which the system operates in accordance with its goals.

Top management has the duty of supervising and coordinating the individual thrusts of the different departments into one effective effort. This concept is applicable at the individual department level as well. In order for individuals, or units, under the manager to be effective, they must have at their disposal the necessary tools to do the job. This can only be accomplished through effective delegation. No manager can do it all. Managers have the specific responsibility of overseeing, or supervising, the efforts of their employees. The specific approach taken will vary according to the managerial style the manager chooses to adopt. The degrees of supervision and coordination needed in any situation are dictated by an assessment undertaken by the manager before adopting a managerial style. Changes in subordinates and in the transit system's operating environment are inevitable; therefore, the manager's approach to supervision, coordination, and style must change accordingly.

Good supervision is essential in a transit operating environment due to the many factors that influence buses as they travel their routes. Though the specific route of the vehicle is predictable, timing, traffic conditions, weather conditions, ridership, and operator and vehicle performance are bound to vary hour to hour, day to day, season to season, and so on. The responsibility of supervision includes continually monitoring these factors, then making adjustments to the delivery of the transit service, so that the consumer can come to expect consistency and reliability of the product. Every supervision and coordination effort in the transit operating environment must be made with the ultimate benefit of the consumer, or potential consumer, in mind. Otherwise the efforts of the other employees, managers, policymakers, elected officials, taxpayers, and state and federal support staffs are foolishly wasted.

The Environment of Transit

Accepting the reality that transit management cannot cause 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 organizational structure for a transit property.

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 transit. The tone of the national economy and state economy may also have an impact on the environment of transit. A healthy economy is one of high levels of employment, usually producing high levels of ridership for transit. A strong economy also generates more tax revenue that might 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. A less than prosperous economy may be so weak that federal, state, or local lawmakers are reluctant to commit funds for a host of activities; there may be absolute cutbacks in spending and steps to eliminate programs. Sharp federal cutbacks in aid may force state and local government to play a larger role. Other important factors affecting transit are those 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 and by the sharp increase in petroleum prices in 1979. Ecological concerns and what to do about them may also have an impact on public attitudes and support for transit.

The development of a realistic national urban policy can have a real impact on transit should the federal government, in league with other levels of government and the private sector, 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 individual transit managers is apt to be relatively small on a national level, they can work with local members of congress to see that their 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. With the help of local elected officials managers may

also want to work with the U.S. Conference of Mayors and the National League of Cities, which have been strong advocates of transit on the national scene.

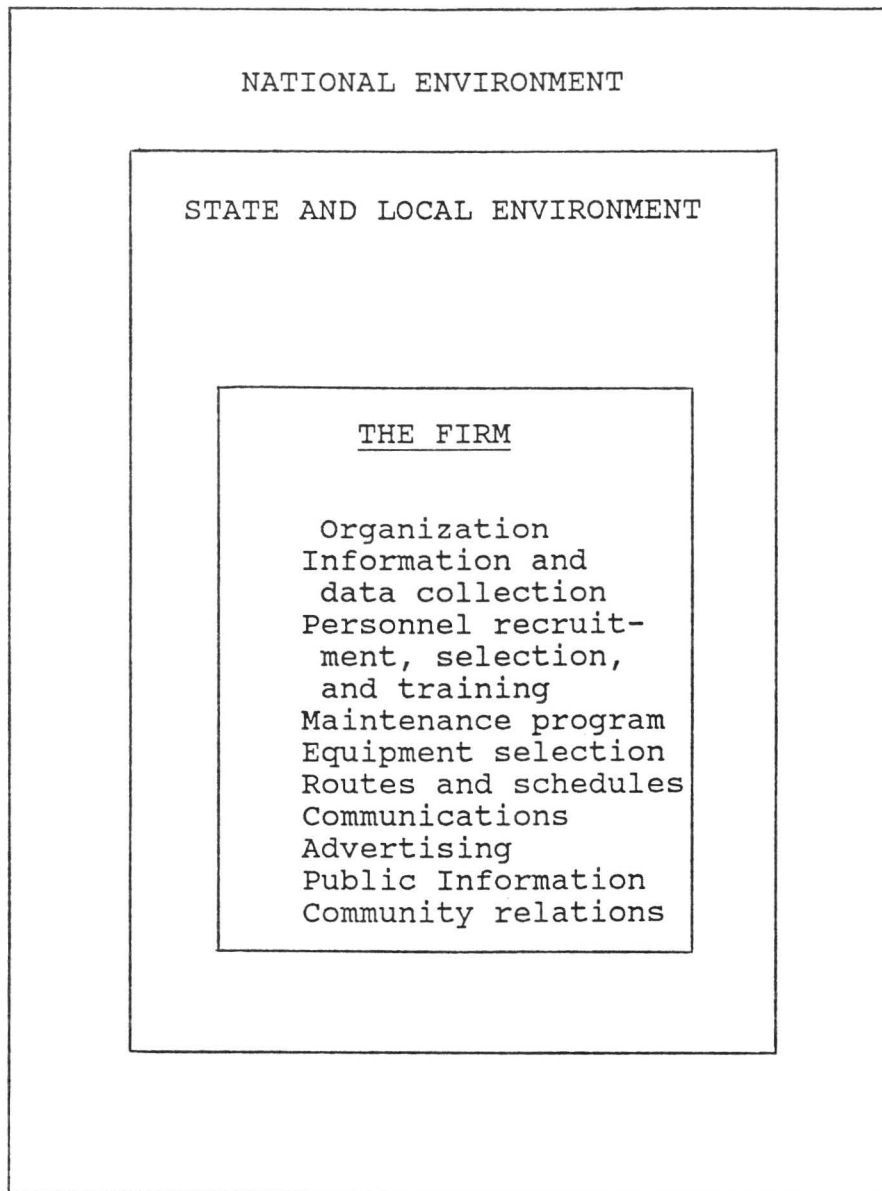


FIGURE 4.1 The Environment of Transit Management

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 a positive attitude towards 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 can also provide a means for local management to have an impact on the state transit environment. A program of state aid to transit through a program to match part of the local share of a federal grant of capital or operating aid is a good example.

Locally, the environment can be affected by working with 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 may also be affected in a positive fashion (see Chapter 15). 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 12 variables that management can mold to provide good transit service; these 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. Procurement.
7. Transit routes and schedules.
8. Supervision and communications.
9. The marketing program.
10. The advertising program.
11. The public information program.
12. The community relations program.

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

The Art of Management

There has always been discussion about whether management is mainly an art or a science. Although there are scientific elements in management, good management is also an art. 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 is also closely related to personality and the ability to get along with other people. Because it is often a matter of the chemistry of interaction, the true essence of management is elusive.

In the final analysis, the success of the manager or leader depends on the ability to generate results through people and available resources, which when accumulated over a specific period of time, meet or exceed the predefined goals of the organization. In short, management makes things happen.

Management Roles

When asked what managers do, many persons will cite the familiar textbook definition of the planning, organizing, motivating, and controlling tasks that are usually 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, they are not always distinct but are woven together into what is often called management style.

Coordinator and controller. Managers have the essential task of coordinating and controlling the use of resources devoted

to mass transportation. It is here that they will play the roles defined below. Coordination and control of resources requires 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 managers to be activators, 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 whom to contact for information or action on 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 spokesperson, 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. Information is generated at all levels of an organization and it must flow up and down between levels. Managers at each level are truly artful managers if they know how much information they need from below or above and how to make sure they receive it. Too much information is as bad as too little. Knowing just enough is the skill; the art comes in getting it.

With the uncertainty in the environment in which small city mass transit operates, the role of the manager as an information processor is crucial. Accurate assessments of federal funding strategies, for example, are essential to the manager's efforts in keeping local officials, taxpayers, and employees briefed on potential impacts on the level of service, anticipated local funding needs, and employee job status, respectively.

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 active and effective. 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 never really in control of the situation. In its response to the myriad of problems that have beset mass transportation in the past four decades, transit management has unfortunately 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 the 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 is essential.

Management by Objectives

In Chapter 1 there was a discussion of management by objectives (MBO) principally from the viewpoint of establishing goals and objectives at the top policymaking level. The stress in Chapter 1 was on giving direction to the transit enterprise in the broad strategic sense. In this chapter, however, the stress will be on the use of MBO for the regular, day-to-day operations of a transit property. The material presented here involves the techniques of translating the broad goals and objectives of the transit property into concepts and actions useful for the delivery of service and the careful management and control of that operation.

It must be noted that MBO is very difficult to carry out completely. MBO is a deceptively simple process; it is attractive because it makes good sense as an approach to management, especially in contrast to management simply reacting to problems. Applauding the concept is one thing; putting it fully into practice is another. MBO must be carefully and totally implemented in order for its full benefits to be realized. To implement MBO completely requires careful follow-up on a regular basis and painstaking evaluation and reevaluation of results to determine if all the targets are being met successfully.

Difficulties with MBO arise when unexpected problems that must occupy managerial time develop. It is easy to get sidetracked into putting out fires and meeting unexpected

problems, especially when the problems require time and effort on the part of management and staff. What often happens is that the implementation of MBO gets shunted aside and eventually choked off because more pressing problems demand attention. Unless carefully developed and managed, and strongly supported by top management, MBO appears inflexible and not worth the time and trouble that it takes to carry out the needed steps. Full implementation of MBO is rare; it is often abandoned because of discouragement in the aftermath of some severe, unexpected difficulty.

It is important to remember that MBO is an important tool and the basic concept is sound. The major strengths of MBO can bring dividends to the transit property despite the possibility that some of the details may get lost in the inevitable shuffle of events. MBO's forte is its emphasis on results. Even if the technique of implementation falters, the main point of MBO is that results count. With all its difficulties of smooth and consistent implementation, MBO remains a superior approach to that of attention only to process, such as getting all the buses out on the street in the morning and all back to the garage at the end of the day. A process orientation, while better than a confused and chaotic extinguishing of fires by management and staff, is ultimately poor because it does not stress results. Since public enterprise lacks a profit motive, it is essential that it have goals and objectives to produce desired results. Again, results count; this does not, of course, mean breaking laws to achieve a desired end. It does mean that the precise style of management used to achieve the result (hands-on, hands-off, participative, or whatever the vogue of the moment may be) is secondary to the achievement itself. So, every effort should be made to get MBO to work and managers and employees should not be discouraged if the plan of implementation is not carried out to perfection.

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.

Management must also develop a strategy that contains 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-term condition considered to be an ideal or a model situation. A number of objectives will have to be set, and over time--perhaps a considerable amount of time--many actions may be necessary to achieve any one of the goals.

The following list is an example of goals that may be considered by 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. Conserve energy.
4. Sustain and enhance economic growth and vitality in the community.
5. Provide the highest feasible and practicable level of safety for people, goods, and the environment.
6. Cover a reasonable proportion of costs from the farebox through efficient and cost-effective service.

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 by 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 by 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 policymaking board and top management is to help define the goals of an organization and to provide a sense of direction. 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 and effective. It is also important that people set the standards 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 efforts made throughout the organization toward achieving the overall goals and objectives of the enterprise. Thus, an organization run by the MBO process not only has a clear

idea of where it is going, but should also have the full cooperation of its employees since they should 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, management should 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. Figures 4.3 and 4.4 simply take two of several detailed underlying aspects of the organization and provide examples of how to review these aspects in more detail. Another way to handle the inventory process is by means of a management performance audit, or management evaluation. If properly and completely done, an audit can provide much needed information and give important clues to those areas in which action is needed. Management performance audits are discussed in detail in the publication Mass Transit Management Performance Audits (Bloomington, Indiana, Institute for Urban Transportation, 1979).

After the situation is fully inventoried, the model action plan as shown in Figure 4.5 then sets out the major steps and action to 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 both management and transit 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 research into consumer attitudes may show that the perception of reliability that the consumers have is mistaken and that corrective action should be taken in some other area.

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 scheduled running times for different route segments at different times of day. Actions that might be taken to resolve the problem are set out on the form.

TRANSIT OPERATIONS

	<u>YES</u>	<u>NO</u>	<u>N.A.</u>	<u>COMMENTS</u>
1. <u>Are your revenue vehicles appropriate to your operation in terms of:</u>	_____	_____	_____	_____
-their general appearance?	_____	_____	_____	_____
-proper identification?	_____	_____	_____	_____
-their cleanliness, both exterior and interior?	_____	_____	_____	_____
2. <u>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? . . .	_____	_____	_____	_____
3. <u>Does your transit system have any driver personnel practices for the following:</u>				
-selection criteria?	_____	_____	_____	_____
-training program--both classroom and on-the-road?	_____	_____	_____	_____
-morale boosting activities?	_____	_____	_____	_____
4. <u>Do you have written operating policies for the following:</u>				
-fares and transfers?	_____	_____	_____	_____
-accident reporting?	_____	_____	_____	_____
-defect reporting?	_____	_____	_____	_____
-passenger counting?	_____	_____	_____	_____

FIGURE 4.2 Inventory Example--Transit Operations (Continued on following page.)

	<u>YES</u>	<u>NO</u>	<u>N.A.</u>	<u>COMMENTS</u>
-smoking?	_____	_____	_____	_____
-change-making?	_____	_____	_____	_____
-absenteeism and tardiness?	_____	_____	_____	_____
5. <u>Do your supervisory personnel:</u>				
-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. <u>Does your system routinely report on perfor-</u> <u>mance by making the appropriate comparisons of</u> <u>ridership--both system-wide and by routes:</u>				
-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 for 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 of:</u>				
-miscellaneous vehicle parts (side view mirrors, etc.)?.	___	___	___	___
-engine parts (fan belts, distributors, etc.)?.	___	___	___	___
-engine replacements?	___	___	___	___

FIGURE 4.3 Inventory Example--Maintenance (Continued on following page.)

	<u>YES</u>	<u>NO</u>	<u>N.A.</u>	<u>COMMENTS</u>
4. <u>Do you have the following maintenance personnel programs?</u>				
-mechanic selection criteria.	___	___	___	___
-on-the-job mechanic training	___	___	___	___
-programs to increase employee morale	___	___	___	___
5. <u>Does your preventative maintenance program outline procedures for regular vehicle inspection and major overhauls with regard to timing according to a schedule?</u>				
-daily inspection	___	___	___	___
-weekly inspection.	___	___	___	___
-monthly inspection	___	___	___	___
-schedule of major overhauls.	___	___	___	___
6. <u>Do you have:</u>				
-repair time standards?	___	___	___	___
-work orders?	___	___	___	___
-individual vehicle recordkeeping?.	___	___	___	___
-inventory control and restocking?.	___	___	___	___
7. <u>Does vehicle care consist of:</u>				
-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>				
-a 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>				
-the 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?	___	___	___	___
-an analysis of utilization of vehicle capacity.	___	___	___	___
-a regular program to obtain marketing information from users and potential users?.	___	___	___	___
-regular route and schedule reviews?	___	___	___	___
-identification of potential special service needs of the community?	___	___	___	___
 4. <u>Does your system have a promotional plan</u>				
<u>consisting of:</u>				
-an advertising program based on analysis of target markets?	___	___	___	___

FIGURE 4.4 Inventory Example--Marketing (Continued on following page.)

	<u>YES</u>	<u>NO</u>	<u>N.A.</u>	<u>COMMENTS</u>
-community relations programs (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 hygienics?	___	___	___	_____
-an employee-customer relations 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:	
1-89	A. Spot-checks major generator or terminal points and notes number of late or early arrivals.	on-the-road supervisors
	II. Actions to Analyze the Problem:	
2-89	A. Route running times of route segments are clocked against scheduled running times, noting running difficulties/discrepancies.	supervisors
2-89	B. Drivers are surveyed as to each route's characteristics in regard to running time.	supervisors
3-89	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.	_____

FIGURE 4.5 Model Action Plan (Continued on following page.)

<u>Target Date</u> <u>For Completion</u>		<u>Operational</u> <u>Responsibility</u>
_____	C. Impose exact fare policy.	_____
_____	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.

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 unreliable running times is excess time spent at stops, one internally based action might be to impose an exact fare policy to speed up boarding. Another would be to revise the schedule. 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 are the months 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 out. These forms present one possible format; other formats may achieve the same result. 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.

The most important feedback is achieving objectives and obtaining desired results. Monitoring actions carefully as time goes by permits corrections to be made before the target date is reached. Regular monitoring of the feedback reports will help management adjust target dates. For example, a target date for installation of bus shelters may be delayed because of a strike at the shelter manufacturer's plant; the target will have to be adjusted to reflect reality.

"MANAGEMENT BY OBJECTIVES FORM"

OBJECTIVE:

(including the
method of measur-
ing achievement,
date of accom-
plishment, and re-
sponsible party.)

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 ROADCALLS 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 ROADCALLS TO STANDARD	REVIEW MONITOR AND MODIFY SYSTEM	OPERATIONS ADMINISTRATION	
			<p>ADVANTAGE OF THIS FORMAT IS THAT IT PRESENTS IN A VERY CLEAR FASHION NOT ONLY THE OBJECTIVE, BUT ALSO:</p> <ul style="list-style-type: none"> * STEPS OR ACTION REQUIRED TO ACCOMPLISH THE OBJECTIVE * ENTIRE TIMETABLE INVOLVED * TARGET DATE FOR COMPLETION * OTHER DEPARTMENTS WHICH MUST COOPERATE TO ATTAIN THE OBJECTIVE 							

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FIGURE 4,7 Operating Action Plan

Thoughts and Caveats about MBO

Management by objectives is a deceptively simple concept as well as one that is powerful in the results that may be achieved; its power resides in its focus on accomplishing things through the use of goals and objectives. However, it is not easy to develop useful and proper goals and objectives, particularly in the early stages of development. As in so many human efforts, human frailty may defeat the soundest idea or concept.

The MBO program must have the support of upper management; it is not enough to have the support of lower management and rank-and-file employees or even the support of policymakers. Everyone up and down the line within an organization must be leaning in the same direction and must support the MBO concept. MBO is nothing less than a negotiation process on what is to be done that is carried out between all the parties involved from top to bottom. Negotiation is not easy. Many persons new to MBO will have difficulty understanding exactly what is expected of them, and most people have not had the experience of writing a formal objective.

Another potential problem lies in not setting the right goals, which naturally will affect the objectives that flow from the goals. For example, the setting and environment may demand goals and objectives strong on controlling costs; however, management's misinterpreting or ignoring the reality of the situation may result in goals aimed at potentially expensive ventures designed to increase ridership. Attention has to be paid to the environment and the values and needs of the community and the transit system; strategy and goals must be based on reality, not on wishful or fuzzy thinking. The goals must be the right goals, and in order to be so, management and the governing board must pay strict attention to what is going on in the environment around them.

Another factor to be considered is whether or not the appraisal and reward system of the transit property is congruent with the MBO philosophy. The evaluation and reward system has to consider whether or not an employee can accomplish the objectives that the employee played a role in establishing. The focus on accomplishment means that little or no attention should be paid to personality traits. The spirit of cooperation is important in making MBO work, yet, paradoxically, many high achievers prefer to work alone and often have abrasive personalities. Managers have to learn to work around such situations.

On the plus side, MBO relates individual performance to organizational goals which helps insure that an effective balance is struck between the employee who has a need to be needed and the manager who knows what is needed. The MBO process may foster increased competence because the objectives chosen may make both employee and manager consider and implement new methods of doing tasks. Increasing competence and growth among managers and employees may be a desirable product of MBO since the organization

and its members are involved in a continual striving for better ways to accomplish objectives and goals. MBO can also improve the communication between managers and employees because negotiating about objectives makes clear what is to be accomplished and by what date. There are no surprises.

MBO may fail for many reasons. The goals or objectives may be set too high or too low. This should get better with experience but it can be a major source of frustration at the beginning of the MBO process. In implementing MBO, there may be too many reports and too much movement of paper; the process could flounder in a sea of reports. The links in the MBO system should be as simple and straightforward as possible with a minimum of paperwork.

If management dictates objectives to employees there is a danger of generating employee hostility or of receiving minimal cooperation. This may happen especially at the initial stages of the MBO process when all involved are uncomfortable with the whole business; management may have to guide employees, to the extent that the objectives developed are really not those of the employees. Employees stuck with objectives not of their own doing may come to resent the process and work to sabotage it. Another problem arises when there is a failure to identify joint responsibility between different parts of the organization. This is easy to do at the beginning of the MBO process; the frustrations and failures should decrease with practice.

Interpersonal relations are always subject to difficulties. If the MBO program is implemented strictly for the good of the program, and not the people, it is apt to receive lukewarm support; it is similar to having management set the objectives. Another source of frustration is where the evaluation system has not been brought into line with the reality of MBO, and personality traits rate higher than an individual's contribution to the management process.

A last problem is related to the setting of unrealistic objectives. Job survival may, or may seem to be, unattainable; this is apt to force employees to lie, cheat, evade, avoid, and eventually to fudge the numbers in fear of looking bad. The solution is the proper implementation of MBO and the choice of carefully considered objectives and timetables for achievement.

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 have a plan so as to unexpected or unpremediated actions; managers are obliged to plan with 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 forms. Before data collection is begun, guidelines should be established as to 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 is. Analysis may range from a simple mental weighing of pros and cons to using a highly sophisticated computer program. 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 have already 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 possible understanding 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 of the immediate organization. It is very easy to become introverted in one's work and in one's efforts to achieve certain goals. Long-range planning forces management to move beyond the organization and to look outward. This is particularly essential for mass transit management, which as a public service depends upon the goodwill 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 is therefore automatically caught up 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 above are quite general and might apply to either long- or short-range planning. One year is often used as a dividing point between long- and short-range. Short-range planning, which really might be called operational or tactical planning, involves planning for events that will take place in less than a year. For longer periods, extending from one to

thirty or more years, long-range or strategic planning takes place. For example, entry into the charter business might be considered a long-term 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 two or three years. Developing plans for a new maintenance facility, obtaining the money, and carrying out the construction tasks is another example of a long-range planning and implementation effort. On the other hand, checking in new equipment familiarizing drivers, making initial inspections and working new equipment into schedules for maximum benefit is rightly considered short-term. 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 is often 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 are external. One internal source is the vast amount of financial and operating data that is required by Section 15 of the Urban Mass Transit Act. Section 15 is a uniform system of accounts and records designed to format financial and operating information consistently among different systems. The purpose of the reporting system is to assist in meeting the need for information on which to base planning for public transportation services, and to make public sector investment decisions at all levels of government. 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. Complaints or questions about service are a potentially rich source of information from transit systems users.

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 be 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

There is currently an ongoing revolution in the definition and function of the modern business organization. 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 through the shaping of human and material resources into a functioning whole. Good organization will maximize the efforts of those involved by channeling the efforts of individuals toward the objectives of the organization and by dividing and fixing authority and responsibility for action.

The essentials of good 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.

In the modern organization the delineating lines are not so clear. A number of participative organizational focal points are emerging from which goals and responsibilities are thrashed out, not at the top of the organization, but from an entity put together from different levels within the traditional organizational structure. Though more easily accommodated in larger organizations, a participative management style might be appropriate in instances where the relative maturity of the organization is high, the risk of an adverse outcome is low, and the abilities of the participants are closely aligned to the responsibilities of the task. For example, the assistant general manager, a mechanic, and a bus operator might form a committee on bus stop sign location throughout the system. This group could meet informally once a month and have responsibility for the status and maintenance of all existing sign locations and make recommendations for new installations.

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 working as a team have much more power than the same number of individuals operating independently. Whether in business, government, or other institutions, the major tasks 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 the 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 to be accomplished. In turn, each assistant directs others who are responsible to him. The chain of command is unquestionable when each person knows 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 are still concerned with making 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 master all the complexities of the field. 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 particular firm. 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. Whether it had 10 buses or 100, such a firm would require the services of a specialist. 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 function is likely to be the sole duty of one or more persons.

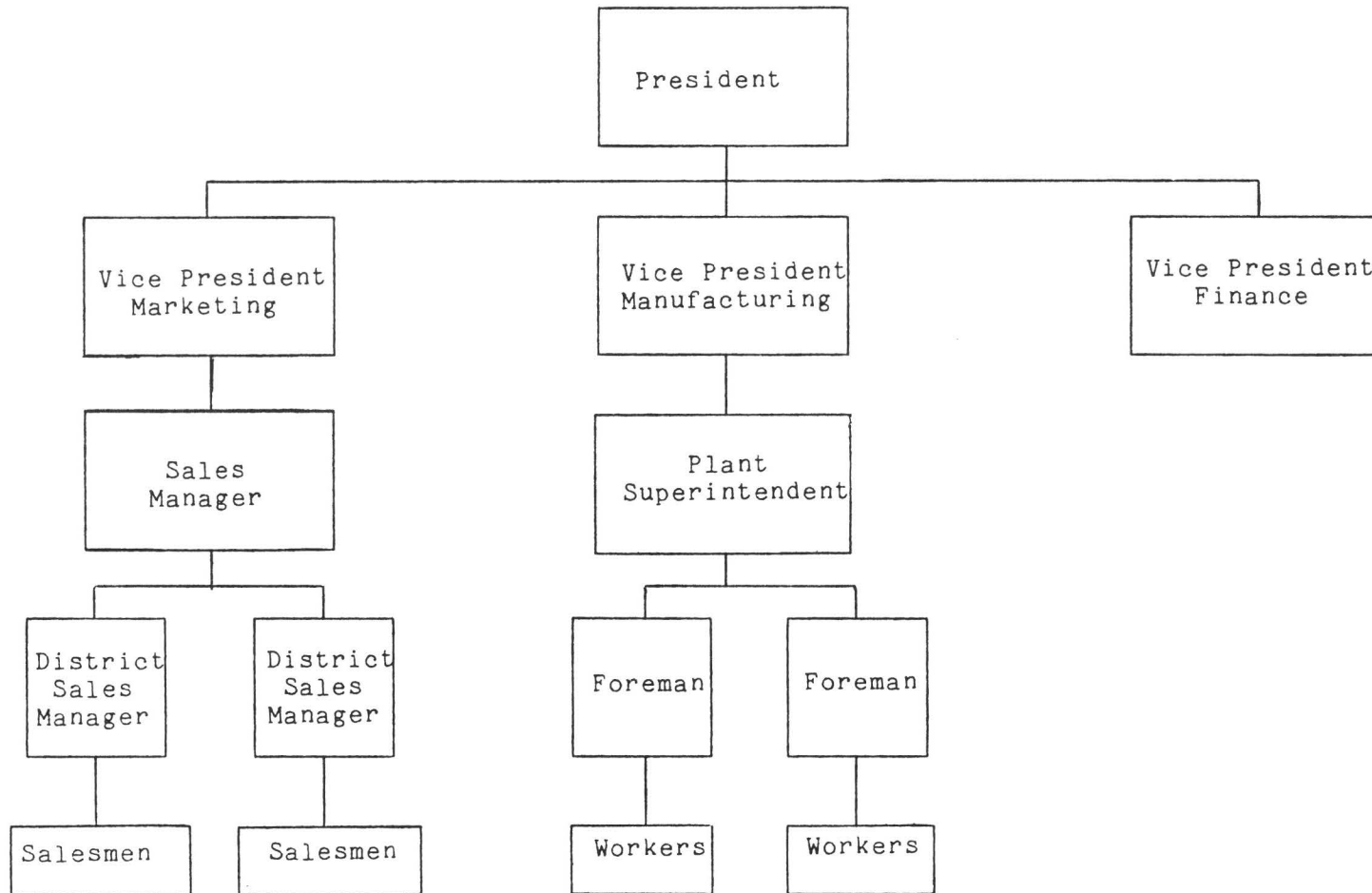


FIGURE 4.8 A Simplified Line Organization

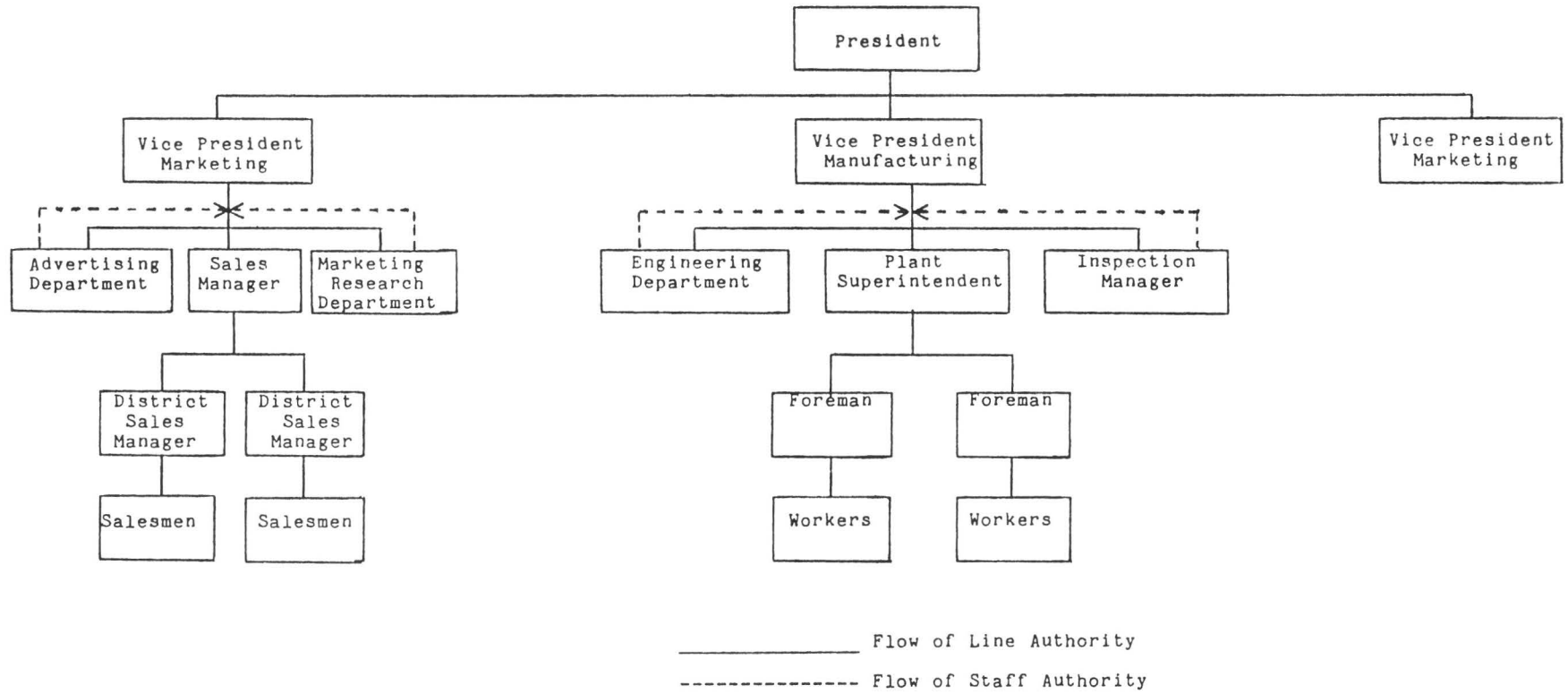


FIGURE 4.9 A Simplified Line-and-staff Organization

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 for 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 personnel will be matched with 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, administrative, 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.

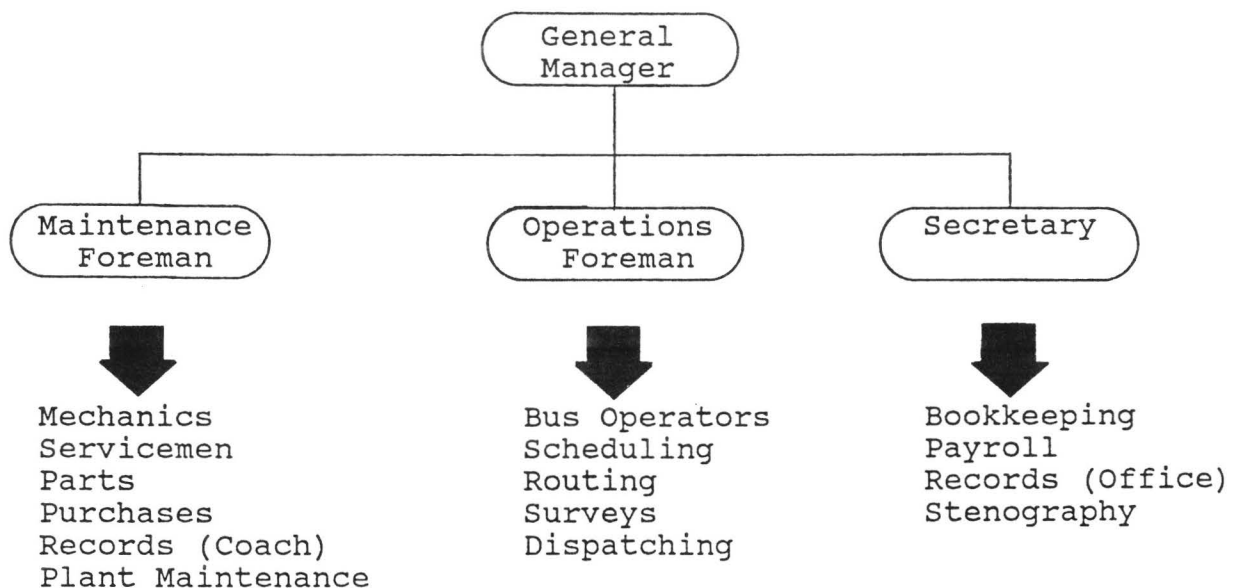


FIGURE 4.10 Typical Small-scale Mass Transit Organization

The weakness of this organizational structure is its lack of a marketing function and the planning/grant administration function.

The general manager and office personnel will probably handle the job as best they can. It is wholly operations-oriented. It also lacks clear responsibility for data collection and analysis, critical tools for effective and efficient management. Indeed, the whole information function is sadly lacking and collection and analysis of vital information is often viewed as a major burden. The main reason for showing this particular set-up 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, and several persons would have to double up on their jobs from time to time in order to get the necessary jobs done.

Recommended Organizational Form for the Small Transit Firm

Transit is usually 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. Operating efficiency and effectiveness are important, but in most places the principal problem facing management is not how to produce transit service but 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 the marketing-oriented form of organization illustrated in the functional organizational chart in Figure 4.11.

Note that this marketing-oriented organizational structure has something to sell. It presupposes that the service is capable of being operated in a reliable and efficient manner. Equipment and service must be reliable and an adequate, reasonably trained staff must be available, otherwise a marketing-oriented transit service is not really possible. The basics have to be present; there must be a service worth selling and buying.

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 position is purely a staff function, responsible to the general manager. The person holding the position must see that planning

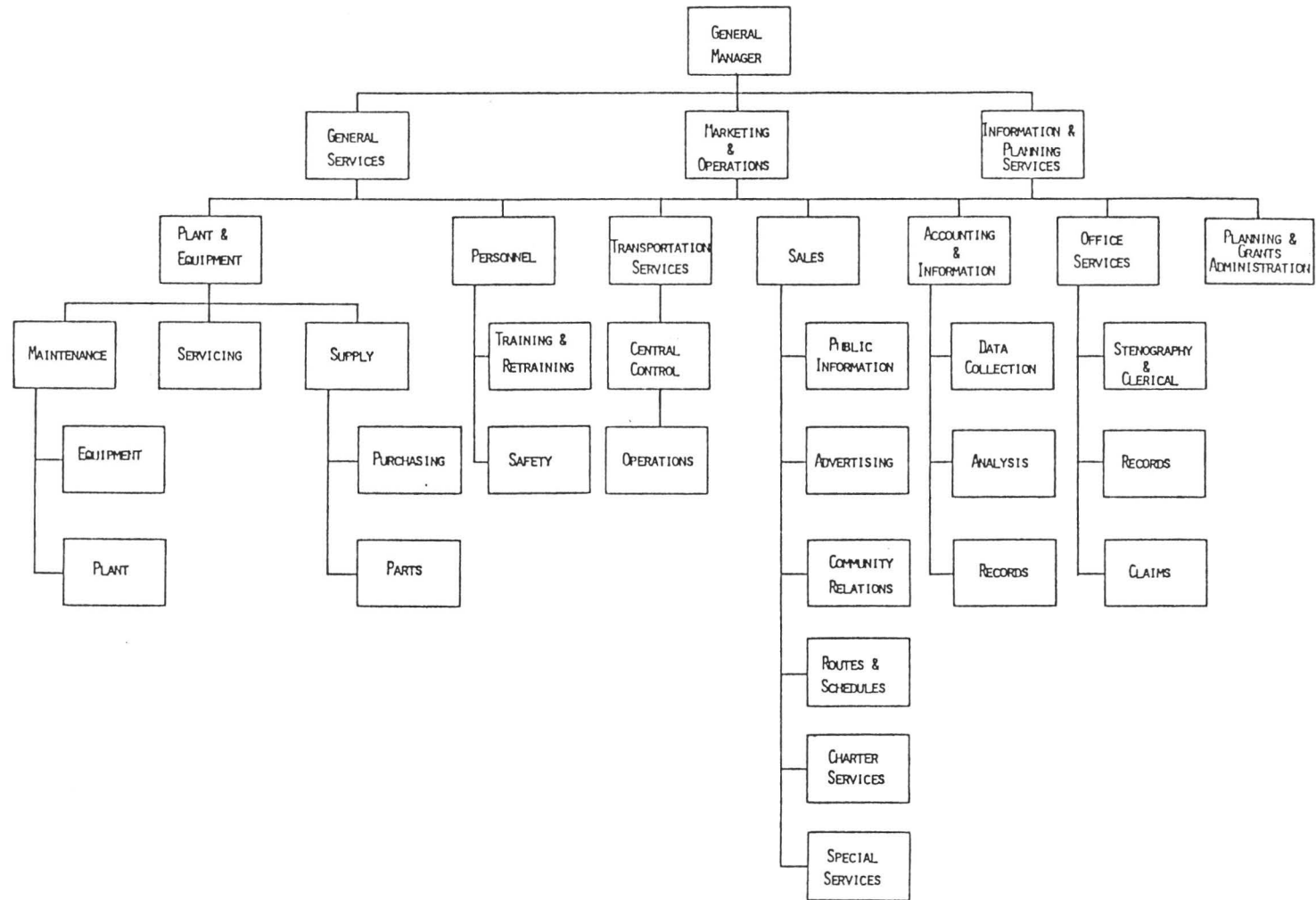


FIGURE 4.11 Suggested Organizational Chart for Small-scale Transit Firms

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 understand its market better and to help make decisions regarding service and financial matters. In the latter category, information services personnel provide accounting reports for management, owners (public or private), and regulators or providers of funds.

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 properties, increasing complexity and the opportunity for greater specialization make it possible (if not necessary) for the functions to be carried out by separate persons or separate 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 operation--one to ten buses might be considered a representative size--the general manager, a chief mechanic, and a secretarial/clerical position can probably 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; much of grants management may also be part of that person's job. 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 assistant general manager, operations manager, or operating supervisor. The manager personally handles the less routine marketing tasks and coordinates the marketing effort. An assistant manager or marketing manager handles the more routine marketing programs. A chief mechanic or maintenance supervisor oversees the maintenance and servicing of equipment. A safety supervisor takes care of training new operating employees and of overseeing the safety program.

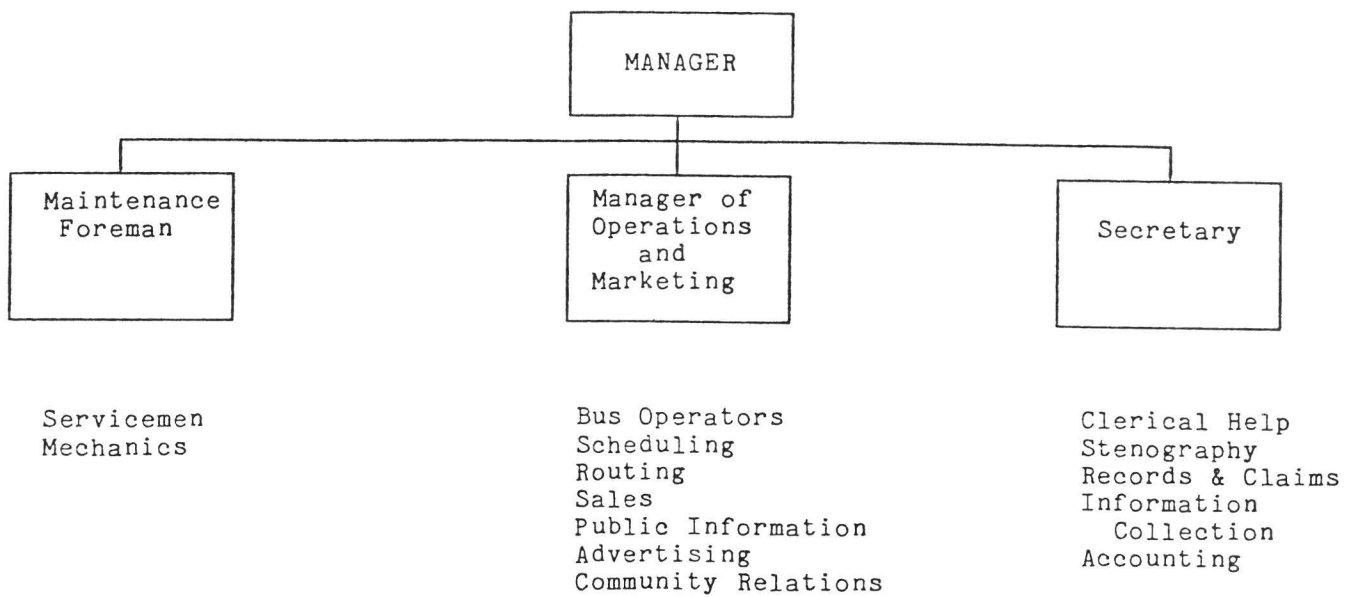


FIGURE 4.12 Organizational Chart for Small-sized Firms (10 or Fewer Buses)

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

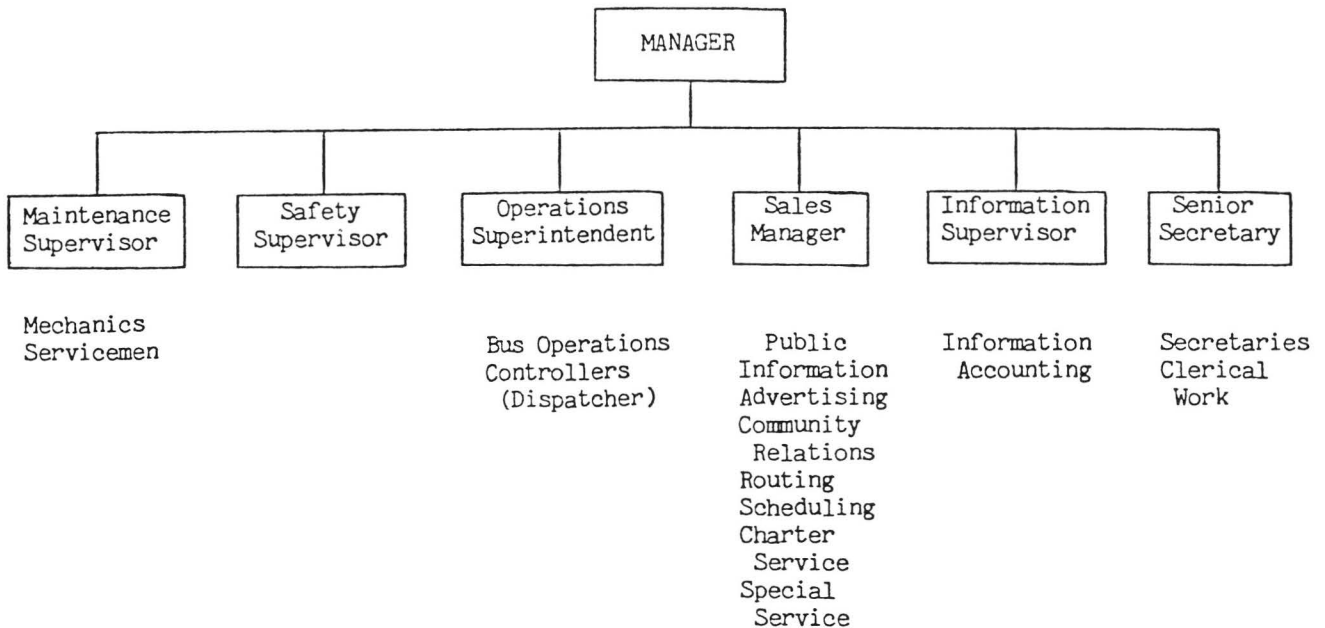


FIGURE 4.13 Organizational Chart for Medium-sized Firms (11 to 30 Buses)

At the larger end of the scale--30 to 100 buses--a situation such as is shown in Figure 4.14 might be appropriate. 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 the 30 to 100 bus 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.

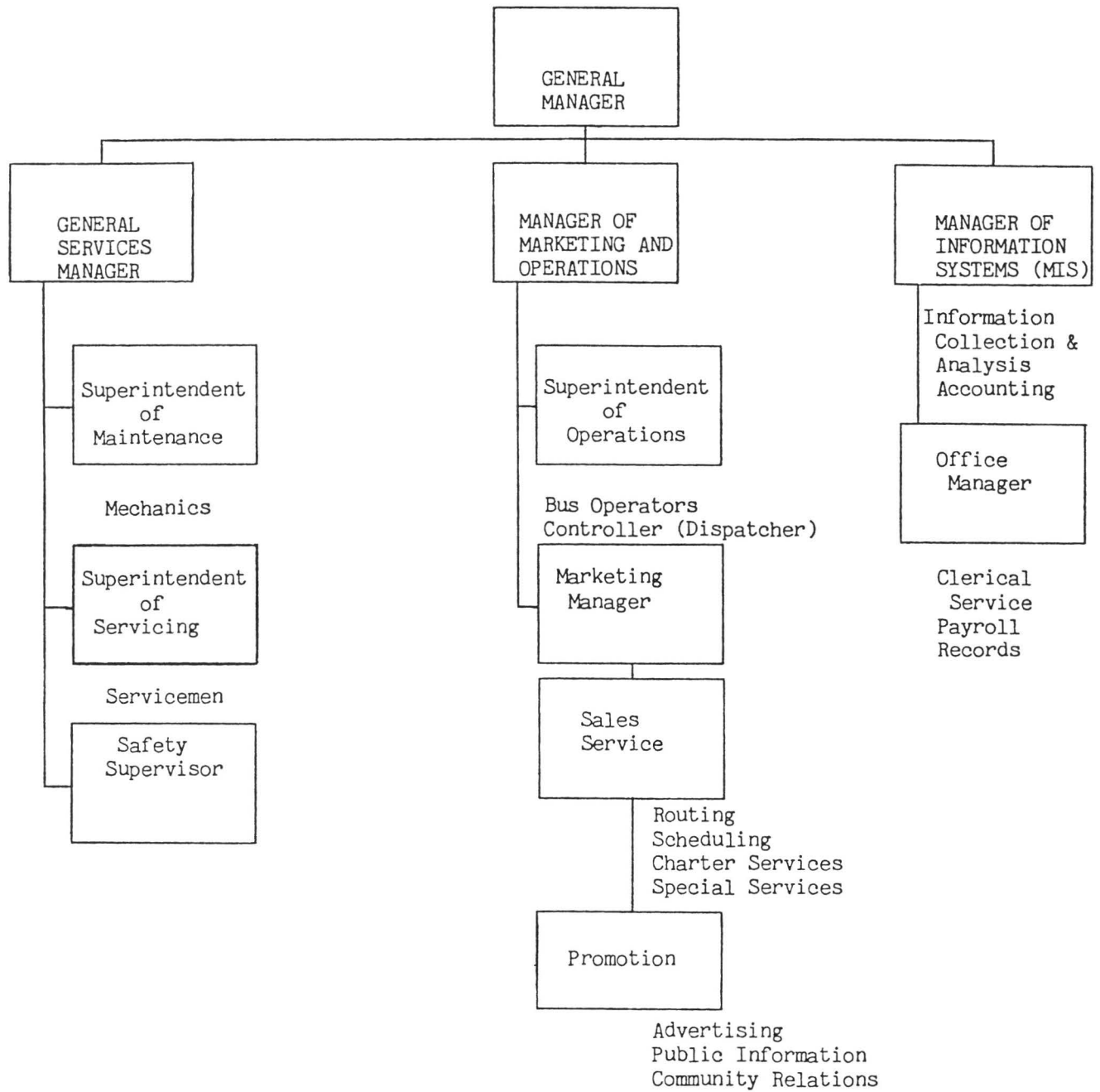


FIGURE 4.14 Organizational Chart for Large-sized Firms (31 to 100 Buses)

Challenges of Small City Transit Management

Management of transit, in addition to all of the elements discussed 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 person may--indeed, probably will--react differently and unpredictably from what is expected. Top management must mold disparate individuals into a team that works toward a common set of goals.

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 aware of 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. Some form of 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 sufficient training 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 and other people seems to be the best instructor.

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 on a largely psychological one, the effect the personnel have 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.

Management by objectives, 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. All of this assumes that the MBO process is carried out with relative completeness and consistency.

Institutionalization of transit is also a critical part of employee supervision. As noted in Chapter 3, the employees must be sold on what the transit agency stands for and what it is trying to accomplish. 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 its patrons has to be made clear to employees. 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 employees' efforts must be combined to their best advantage by the department heads. Department heads must not only possess technical skills, but also human relations skills to carry out their duties effectively. They must be able to view their department an integral part of the whole operation, rather than as a separate, competing entity. In this way department heads can work together to improve the entire organization.

The higher a manager's place in the hierarchy, the broader the view he or she must take of the organization. The people at the top concentrate on operating 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

Several 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 truly wants to manage.

Other major constraints may exist in addition to limits on authority. One of the most important 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 out of operating subsidies. The manager is often 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 funding 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 will already be established. While these 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 by both the property's current circumstances as well as by its past.

The manager must also learn to live with the physical characteristics of the area. Hills, curvature, the pattern of streets and the route structure it may support, the quality of paving, and the location of traffic generators are the givens with which transit must operate. 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 so as 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.

Guidelines for Management

The following guidelines have been found to be useful to management in the performance of its 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 to the system's efficiency and usefulness.

Flexibility may demand frequent minor 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 is also partly achieved in the structure of the operation itself--for example, in its 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 are often 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 is usually tied to the number of levels in the hierarchy of the whole organization. In a small organization the maximum number should probably not exceed a half dozen persons reporting to a manager.

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.

Other matters of concern. Management must also 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. Neither management nor employees can function at their highest level of efficiency without a free exchange of information.

Management should also be on guard to avoid undue political pressure. 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 someone else's mistakes. This is a troublesome and sensitive area. A properly constituted and motivated policy board may run interference between the politicians and transit management; it is proper for policymakers to do so.

Pressure may also be brought upon management 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 relatives is more than anyone should be willing or forced to bear.

Responsibilities of Management

Transit management, whether private or public, has several internal and external responsibilities. Internally, management is responsible to owners and to employees; externally, management is responsible primarily to the public. These responsibilities must often be balanced against each other. For example, the public may desire more frequent service than is financially feasible for the property owners--be they private individuals or a public agency--to tolerate. Therefore, some middle ground must be found, unless the public can be convinced to pay for the quality of service it says it wants.

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 other demands must be balanced. Public ownership, on the other hand, demands that management make prudent use of the public resources entrusted to transit.

The public, 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 task of the policymakers is to articulate what the public and the community want and need, as outlined in Chapter 1. Management and staff may help in this process; planners should also be expected to provide information and advice. The key contribution of management, staff, and planners is their knowledge of what can be accomplished with the resources at hand and expected resources.

Management also has a responsibility to itself, the organization, and its employers to take time to think. This may seem obvious, but most people and most managers seem to be so busy being busy that they do not take time to think about what should be done. New ideas and new ways of doing things may not be developed if management does not have time to think. Ideally, the top manager's time should not be so taken up by important but routine tasks that thinking about a variety of matters is precluded. Sometimes this is called "management by wandering around." It involves trying to see the transit organization from various perspectives, making an effort to understand the problems and possibilities of the organization, and then developing new ideas, and figuring out how to implement them.

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" may also be 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 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. The directors of a private firm are often selected because of their knowledge and expertise, factors that are often crucial to company success and protection of shareholders' interests.

In a public enterprise, the responsibility of the directors is to the public, which is the real owner of the transit agency. The directors have the main task of dealing with the public and public officials. Through an assessment of public needs and desires, the board will establish the goals of the transit enterprise and work with management in developing priorities and formulating 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. Having named top management, the proper role for the board of directors is to stay out of daily 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 for their advice and counsel. Management should also seek guidance on sensitive or political matters.

An important point, mentioned above and repeated because of its importance, 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 local officials. The political input should then be filtered by the directors and passed on to 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, several directors may form a finance committee or a marketing committee in order 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 when 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.

Both managers and board members should be working to make the dollars they have go as far as possible. Contracting out certain tasks on a competitive basis may be one way of doing this. Direct and clear-cut tasks are probably the activities best suited to dealing with the private sector. An example would be handling the body work and painting on buses. Small transit properties rarely have enough of such work to warrant having the proper paint booth or employees skilled at body work and painting. Instead this work could be handily contracted out on a competitive bid basis to a local body shop. Counting money may

be contracted out to a local bank, and cleaning of structures may be best contracted out to a local janitorial service. The same may be true for the operation of special services for the elderly and handicapped, especially when vehicle types other than the regular buses are needed for the service. As with any outside contract, performance must be carefully monitored; the price of dealing with outside providers is the need to audit their performance and their bills.

One of the major problems transit managers face in working with the board is that board members will almost certainly lack any knowledge of the transit business. Many of the board members may also lack any knowledge of business practices; this is especially true if by election or selection the members represent a constituency rather than expertise. Managers must brief directors frequently and carefully on critical factors about transit as well as on good, businesslike management practices used by the property. Managers must present the board with reasonable options for action as well as the likely results of adopting those options.

Even briefing the board may be difficult: in almost all cases directors do something other than serve on the board for a living. Most board members of transit properties are reimbursed only for expenses; they receive no salary and their time is often very limited. Moreover, strictly enforced state sunshine laws may make it impossible for more than one director to be present at any time other than an official public meeting. Management must convey information quickly but completely. Good, capsulized information packages are necessary; emphasis should be placed on where the property stands in relation to the achievement of goals established by the directors. Because of the need for management to inform and educate the board over a period of time, the process usually works best when the membership of the board is relatively stable for a number of years.

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 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.

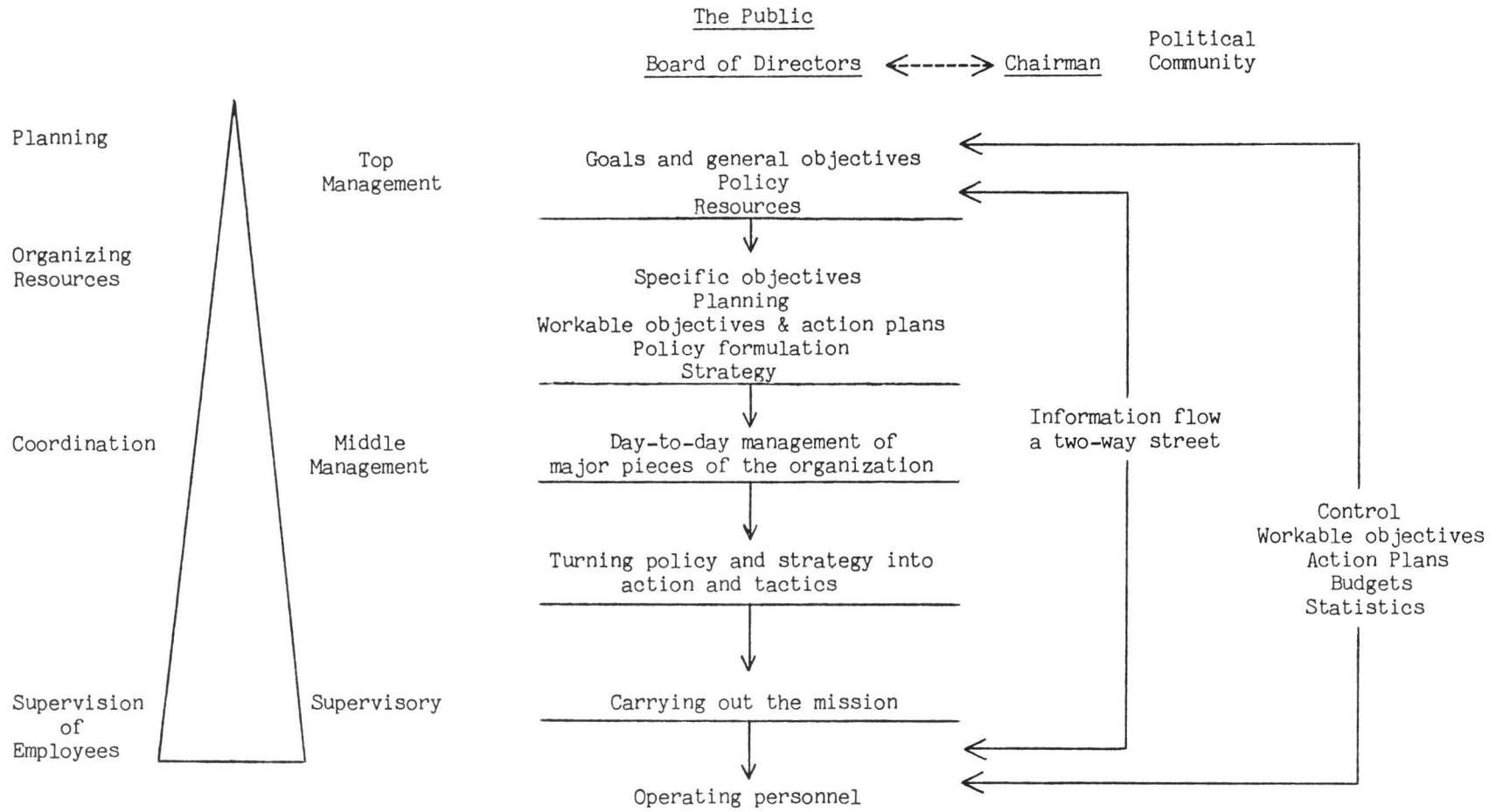


FIGURE 4.15 Management Process

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, 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 established. 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 supervisors carry out the established tasks through their 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. Reports on performance budgets and other statistical information stitch the process together and provide indicators of the progress made toward achieving goals.

Finding (and Keeping) A Good Small City Transit Manager

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

Those who are going to manage in the transit field and those who hire them should go into the process with their eyes open: it is a very difficult job. The decline of transit for the first quarter century after World War II discouraged many ambitious and talented people from entering the field; consequently, there is a shortage of well-seasoned managers because a whole generation was skipped. The switch from private to public ownership also created some problems as did the dependence upon support from federal, state, and local government. There was and is some question as to whether the skills of public administration or business management are most appropriate.

Transit management is not easy. Subsidies from various levels of government bring with them rules, regulations, and requirements embracing service delivery, purchasing, equipment design and procurement, personnel hiring requirements, and the constant uncertainty about funds. Moreover, relative to private sector jobs with the same level of responsibility, the pay for

transit managers is low. As a public enterprise, in which many decisions must be made in public (with public scrutiny of almost all action), transit is operated and managed in a fishbowl environment. This is an unpleasant fact of life to talented managers in the private sector who might otherwise be tempted to try their skills at transit. As a result of these working conditions, tension and frustration are often companions of the job; burnout is not uncommon, and turnover among top transit managers is high.

The typical smaller transit agency will have a small management team. At smaller properties, one or two persons will run the show. The larger properties will have a bigger management team, the number roughly matching the size and complexity of the transit operation. With a small team, management personnel will ideally 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 big cities.

The process of selection is best put in the hands of a management selection committee of the governing board. The committee should handle the bulk of the tasks, perhaps with some staff support. A major job will be to specify the job they want done and to check up on and evaluate prospective managers. The committee should report its recommendations to the governing board. Good managers may be hard to find; qualities to look for include knowledge, communication skills, and foresight.

Knowledge. A transit manager should be well-versed in operations. Preferably, he or she 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 will also help to establish rapport with the personnel. They are bound to have more respect for a manager who is able to do their jobs and to understand their problems. The manager who is cold and aloof will hurt morale.

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 way, the manager's job is like walking a tightrope. He has to be careful to maintain a middle ground without going too far one way or another.

As in most fields of management, few women have headed up large or small transit properties in the past. In recent years, however, many women have entered the transit industry, often in

important positions in planning, marketing, grants management, and management of information systems. To date, women are not found in large numbers in operations management or maintenance positions, but in virtually all aspects of transit, 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 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 he is virtually invisible and unknown. 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 with a strong background in business skills. 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 professional peer or else he will have difficulty in finding the right buttons to push outside the transit enterprise in order to meet the goals of the property.

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 skills

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 on the day-to-day operations of the property. The latter individual would be more in the background insofar as public perceptions were concerned, 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 or a board management selection committee 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 transit properties usually are partly trained already. This training can be either beneficial or harmful to the firm, depending on how the present firm's methods and procedures differ from those of the employee's former employer.

Colleges and universities. Colleges and universities can serve as excellent sources of managerial 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 with the transit property during their summer vacations. In this way, a young person can gain valuable firsthand experience, and the transit management team 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 to handle special projects and fill in for regular staff on vacation.

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 junior members of the management team, 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 advertisement 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 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 prospective employee, they refer him to the company for evaluation. From that point on, the company is responsible for accepting or rejecting the applicant.

If the property is interested in seeking out talent on a broader basis, it may wish to hire an executive recruiting firm. These firms are often dubbed "headhunters" because their specialty is locating persons for high-level positions. Although headhunters do not offer their services cheaply, they are painstaking in their efforts and many observers believe they have a good track record.

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 transit property.

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 services in Passenger Transport, Mass Transit, Bus Ride, Metro and other trade publications.

Management Stability and Tenure

Many actions can help promote the stability and tenure of the new manager. One of the best sources of information on the proper steps is Employment Agreement Guidelines for Public Transit System Management (American Public Transit Association, Washington, D.C., 1982). According to the APTA publication, a proper employment agreement will:

- Formally establish the relationships between the governing board and the general manager.
- Provide stability by minimizing the areas of potential disagreement.
- Offer a framework that the board may use in periodically evaluating the manager's performance.
- Establish ground rules in the event that the board or the manager wishes to terminate the relationship.
- Enhance the ability of the transit property to recruit and retain top quality managers by offering a total compensation package before employment.

The following is a suggested outline for an agreement:

- I. Duties and responsibilities
- II. Conditions of employment
- III. Term of agreement
- IV. Compensation
- V. Termination/suspension
- VI. Compensation after termination
- VII. Other conditions of employment
- VIII. Performance standards and evaluation

IX. Expenses

X. Indemnification

XI. Other terms and conditions

Regardless of the size of the transit property, the key factors in finding and retaining good management are frankness and putting all the factors in writing. The factors by which the performance of the manager will be judged should be clear and definite. Any negotiation about these factors should be up front and not after the contract has been signed. The reporting procedure should also be made clear. Typical contracts for managers (common for transit authorities but not so common where transit is operated as a city department) run for a period of three years, with options for one or two additional years. To get a top-notch manager, it is probably wisest to offer a long contract.

If a professional management firm is considered, three or four of the firms should be invited to give presentations and submit a bid. What services the management firm will provide should be clear from the start of the process. Because most of these firms will provide various services in addition to on-site transit management, the governing board should know exactly what it wants. Usually the management firm will make several candidates available for the on-site management job or jobs for which they are hoping to contract, and the local selection committee can choose the candidate it wants.

When selecting the firm it may not be wise to select the lowest bid. The track record of the competing firms should be considered and members of the selection team should follow up references for both the firm and the managerial candidates to ensure a maximum amount of information. The firm and the manager that appear to be most capable of doing what the governing board wants should be chosen. If several firms appear equally competent, then the bids should be carefully considered.

It is a good idea to put an incentive clause in the contract with a management firm, especially a section that distinctly provides a variety of back-up services to the resident manager or managers. This will help assure maximum performance in whatever goal is deemed most important by the governing board. The incentives can be varied, but should be associated with some factors that are clearly measurable, such as the percentage of costs covered out of the farebox, control of certain costs, increase in the number of passengers, etc. The performance factor is important; indeed, some professional transit management firms pride themselves on being able to cover the cost of the

contract, perhaps several times over, thanks to the cuts in costs or increases in revenues achieved. Some individual managers may wish to have similar incentives in a contract, perhaps with bonuses for exemplary performance.

As with the hiring of an individual manager, most contracts with management firms are for three years, often with an option for a year or two in addition. Longer contracts are probably the most advantageous to all parties because they can get on with the business at hand rather than constant worrying about contract renewal.

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APPENDIX 4A

PLANNING

Planning should be carried out continuously in a transit organization. Planning enables a property to "define and evaluate the procedures required to reach [the] 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 five 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 include 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 or cases in which the environment appears to be changing radically. For example, a transit firm may have been running only scheduled service, but it now has the opportunity to offer special subscription bus service for several large concentrations of employees where employment of the workforce has outstripped the parking facilities. First, the environment is examined to see what possibilities subscription service may have for improving the revenue position of the property. From the findings, basic assumptions can be made. The property's current posture is examined to see if it has or can get the resources needed to provide the service. This examination reveals objectives as to how soon the service should be established (if it should), what allocation of resources will be made, and other items. This process leads to the outer circle.

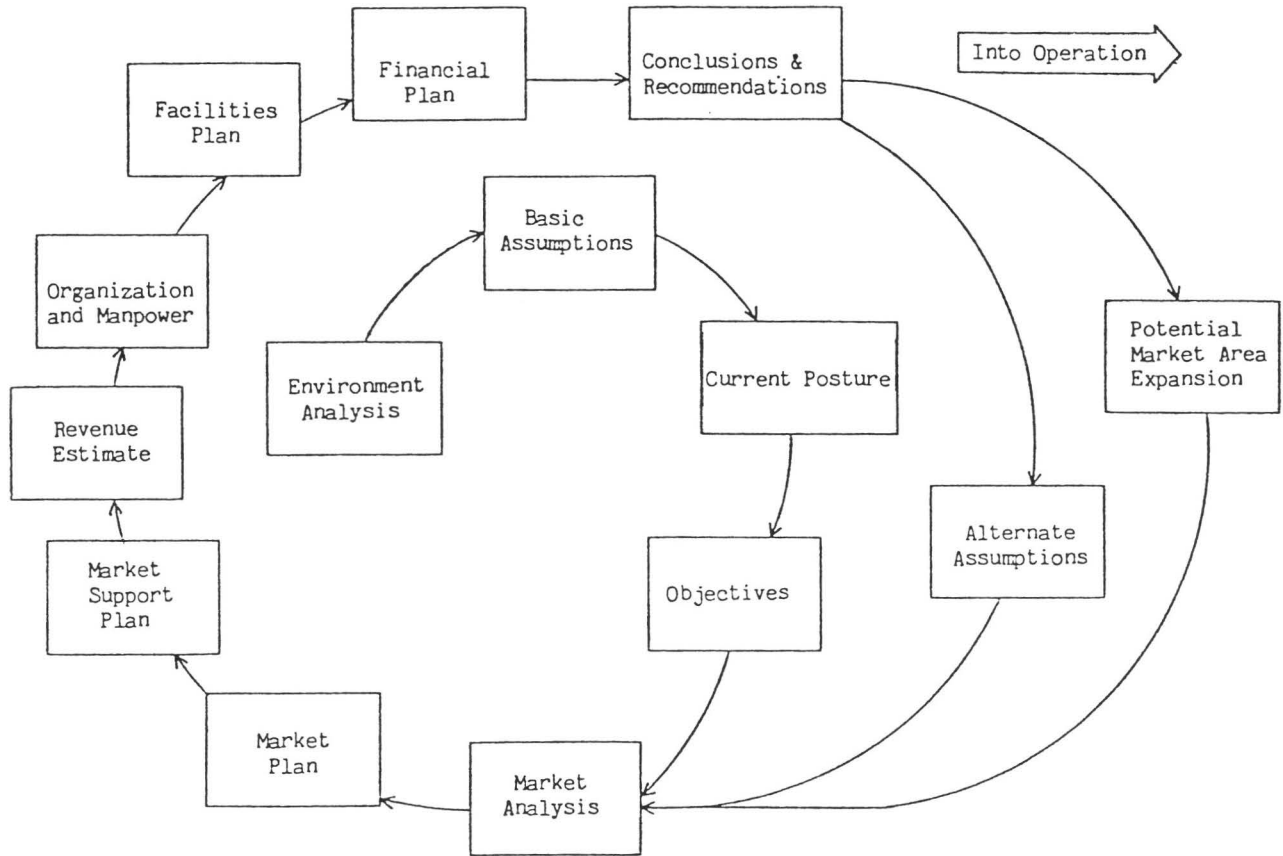


FIGURE 4A.1 Outline of Long-range Planning

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

With the same example in mind, subscription bus service can be examined on the outer circle after the decision to go ahead has been made. Whereas the inside categories are very general, the outside of the circle deals in specifics. A careful analysis of the market for subscription service is performed. From this, the marketing plan is devised, delineating how much subscription business will be sought, what areas would produce the most revenue, and so on. In support, it must be determined what items are necessary to the company. A revenue estimate is made from these plans. The operational plans are made up. They include how subscription service will be worked into the organization, where the necessary manpower will be obtained and trained, what new buses or other facilities are needed, 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 may possibly be made that will increase the likelihood of a successful venture (such as limiting special types of service to off-peak hours to use 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 organizational evaluation, standing plans, and project plans. All three are discussed in the sections that follow.

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 of information, but only rarely will it have all the desired data.

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, pp. 73-85].

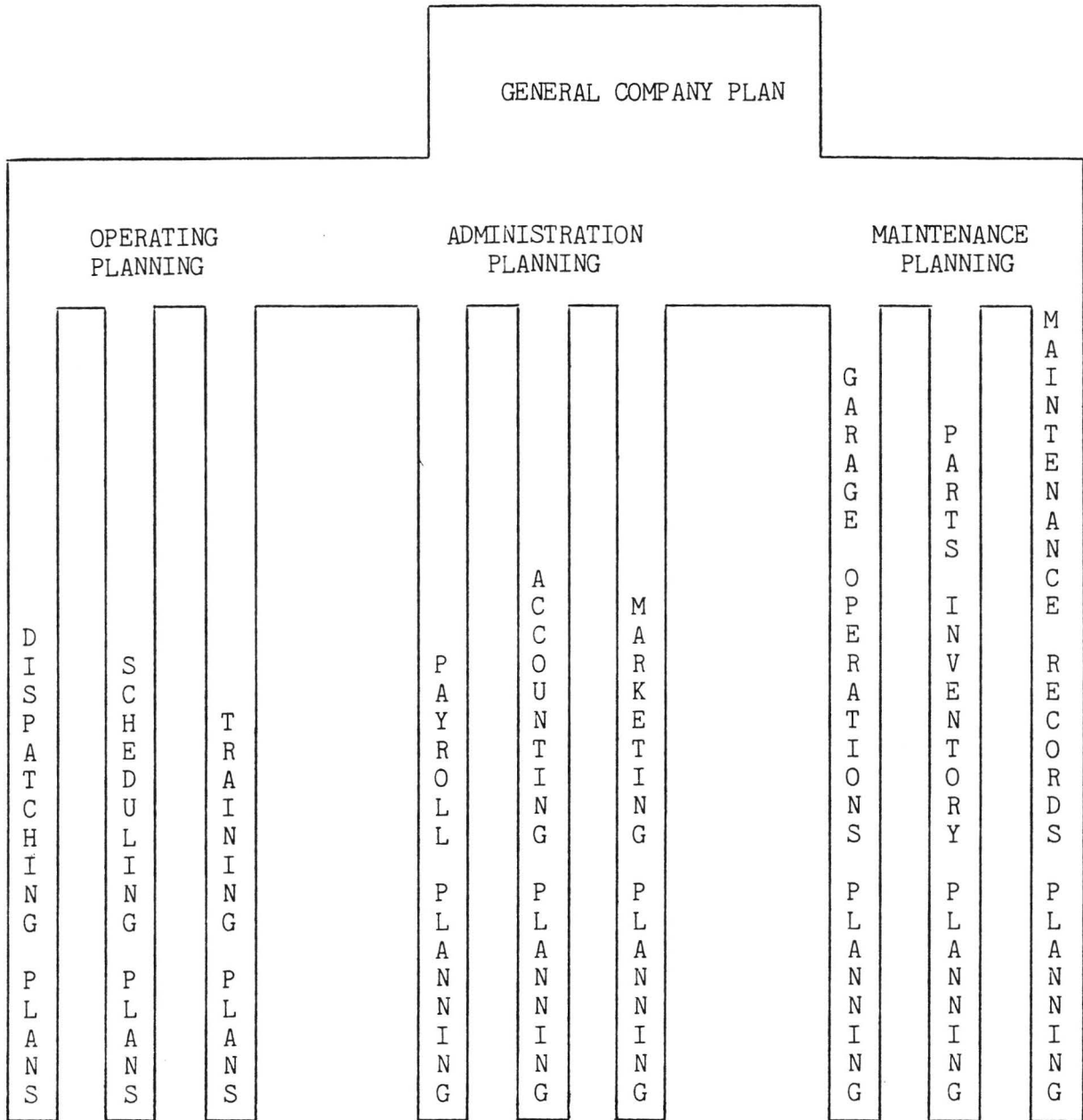


FIGURE 4A.2 Planning Hierarchy

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 1987 model buses on regular route assignments, filling out with 1982 buses, and using the old 1975 buses only when all others are fully utilized. 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 publicly owned transit property, in contrast to most private firms, should be involved in planning with the local government. The nature of the business requires this involvement because 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 engage in cooperative planning.

Working closely with the local urban planning bodies offers definite advantages. One is information, which is discussed elsewhere. Another is that the transit management team can more easily cope with planners' programs if it knows about them in advance, rather than after they are put into effect. Finally, a transit manager 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 should also 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. Cooperation is also prudent in view of the fact that one prerequisite for most federal assistance grants is the operation of a permanent planning body and its approval of plans for any money received for transit.

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CHAPTER 5

MANAGEMENT INFORMATION SYSTEMS

Introduction

The efficient collection and dissemination of useful and timely information is of critical importance to managing any enterprise. Although the specific information requirements of each organization will vary, certain broad information concepts apply to all organizations. The following discussion of such information concepts will be directed toward providers of transit services in small to medium-sized communities.

A transit manager requires a variety of information to successfully oversee the operation of a transit system. Data on revenues and expenses are needed by a manager to assess the financial position of the transit system. Operating statistics, such as passenger counts or platform hours, can be used to measure the performance of a transit system. Management needs to design and implement organized procedures for collecting data, processing data into a useful format, and then to use that information as part of the decision-making and control process.

Several recent technological changes have affected the ability of managers to collect and use information. Some management theorists have suggested that the ability to collect data has surpassed the ability of managers to use the information for decision making, resulting in information overload. Although it is relatively easy to collect vast amounts of data, it is difficult to process that data into useful information and make sound decisions based on the information.

There are significant costs to collecting data. Computers and information systems require investments for the purchase of equipment and the implementation of the system. Software must be acquired, systems need to be designed, and people must be trained and paid to perform the necessary data entry and system maintenance activities.

A management information system is an integrated effort at generating information necessary for planning and controlling the functioning of an organization. The basic objectives of a management information system in any business organization are:

1. To collect, organize, compare, report, and interpret various data that are of value to their users, especially management.
2. To meet legal record keeping and reporting requirements.
3. To provide concise, understandable information 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 help transit managers to set up and operate an efficient management information system. Much of the data collected by a transit system is designed to meet the information needs of its management. However, it is also important to meet the federal reporting requirements of the Urban Mass Transportation Administration (UMTA) and other external organizations. One current federal reporting requirement is Section 15 of the Urban Mass Transportation Act of 1964, as amended (hereafter called the Act). Section 15 of the Act requires that any applicant for federal assistance under Section 9 of the Act be subject to a reporting system and uniform system of accounts and records. In order to meet this provision of the law, a system of mandatory and voluntary reporting requirements has evolved, which is administered by the U.S. Department of Transportation (DOT). Section 15 offers a standardized format under which transit managers can organize their data collection procedures and develop their information reports. This system provides summarized information used by the U.S. DOT and also permits a means for comparison among several transit systems. The Section 15 program will be discussed in detail later in this chapter.

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 operation. The general manager's need for information in report form is minimal; the quantity of data is relatively small, and manual procedures for collecting and reporting data usually will suffice. As a matter of economics, a full-time bookkeeper or information analyst 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 handbook (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. Furthermore, a simple manual processing system will probably be unable to handle the volume of information necessary to manage a larger transit property.

Information Needs and Requirements

Before an information system can be designed, management must decide what information is needed by persons and other organizations associated with the transit system. There are several broadly defined information user groups who are interested in the data collected by a transit property.

Internal Users of Information

Management. Managers and employees at all levels of a public transit organization require information to make decisions on matters ranging from day-to-day operations to longer-range strategic planning. Most decisions involve information collected from a number of different sources. The ability to integrate information as part of the decision-making process is an important aspect of the management function. Control and planning are other important aspects of the management function. Information is also used to oversee or monitor the activities of subordinates in the organization. Information is required in attempts by managers to position the organization for response to future events.

In the long run, spending more for better planning and control is less expensive than operating with no controls or poor controls. The major criterion for information collection and dissemination is that the information must be pertinent to the actions for which each person or unit is responsible. If the information does not meet this criterion, it should not be collected.

The importance of information can be seen in discussing some of the activities required of transit managers. For example, to make rational decisions concerning routes and schedules, management needs several pieces of information. These include revenue miles and revenue hours by route, the revenue and out-of-pocket operating costs by route, and the origins and destinations of current and prospective riders broken down by number, time of day, and day of the week. Such information will likely come from several different functional units or departments of the transit system. When brought together this information can aid a transit property in designing services to meet the needs of its market.

The purpose of a transit system is to provide quality 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. Preventive maintenance programs (discussed in Chapter 7 of this handbook) need information in order to function properly.

Preparing a budget to use in comparison with actual operating results is an effective way of controlling performance.

Most states require public agencies to file an annual budget. 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 adjusted for anticipated changes in the level of service, 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 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 adjust 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 due to the collective bargaining agreement.

Governing board. As a policy-making body a transit property's board of directors requires a wide variety of information. Information is typically presented to the board in summary form (as opposed to detailed operating data used in day-to-day management activities). This summary approach meets the broader information needs of board members whose decisions are directed toward strategic (longer range) planning.

External Users of Information

Stakeholders. Organizations in the private sector have owners (shareholders) who require information to make investment decisions regarding the firm. While a publicly owned transit property does not have shareholders, it does have stakeholders. Users of the transit system (its riders) might be viewed as part of the stakeholder group. Information on routes, schedules, and fares is of concern to users (see Chapter 12 on marketing). The information needs of riders tend to be relatively specific and routine ("what route, which bus stop, and at what time?"). Such information is required on a timely basis. Furthermore, while each individual customer inquiry may be simple, the volume of such calls can be substantial.

Other stakeholders are non-users (nonriders) of the transit service such as elected officials, community leaders, and taxpayers. The information they seek is usually in summarized form and pertains to the overall activities of the transit system. Future funding requirements and service plans may be of interest to nonriders.

With the current emphasis on greater private sector involvement in local transit, shareholder-owned transit operations could possibly reemerge in the transit industry. Such shareholders would require information on the financial condition and operating results of the transit property, just as the shareholders of other organizations are entitled to and rely on in making their investment decisions.

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.

Local officials. Most transit properties are responsible to a local elected official or body (mayor, town council, etc). Elected officials require information as part of their oversight function. This information tends to be oriented toward a broad summary of past and current operations and future plans, with emphasis on financial requirements and service offering.

Regulatory agencies. In addition to meeting the federal record keeping requirements, many states also have accepted the Section 15 system as an acceptable accounting system when reporting to state agencies. If a transit system is located in a state that does not accept the Section 15 system for reporting, it must 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. Such information allows state agencies to monitor transit properties and to oversee the distribution of funding assistance from the state government.

Summary

Clearly, many different groups require information from a transit property. This information varies in presentation format and level of detail. Thus, information systems must be effective in meeting the information requirements of each group. This information comes from the same data sources, but is processed and presented differently to meet the specific information and decision-making requirements of each group.

Management Information Systems

The term "management information system" (MIS) has evolved to cover several different types of information and various methods used to collect, process, and disseminate that information. Because a wide variety of information is required in the successful operation of a transit system, it is difficult to generalize on the data collection procedures and processing

practices for the different types of information. Some of the more common types of information systems will be discussed here.

Accounting Systems

Accounting systems are primarily concerned with recording and reporting the transactions that an organization engages in with other organizations or individuals. In the course of rendering its services a transit system will collect fares, purchase fuel, hire employees, and be involved in a number of other transactions activities, or exchanges. One rarely used approach to handling these transactions is to exchange cash immediately. Cash is paid for the fuel upon delivery, employees are paid at the end of the day, and all passengers pay a cash fare upon boarding the transit vehicle. This approach is referred to as a form of a cash accounting system. Recordkeeping and reporting is relatively simple as only cash inflows and outflows need be recorded. There is no need to keep track of what the organization owes to other entities because payments and receipts occur at the time of the transaction. One limitation of cash accounting is that sufficient cash must be maintained to cover these daily transactions. Furthermore, paying employees on a daily basis would require a substantial administrative effort.

A more manageable approach to handling the financial activities of a firm is through accrual accounting. Accrual accounting records financial transactions as they occur, regardless of whether cash is exchanged at that time or subsequently. Fuel purchases are totalled over a 30-day period and a single check is cut and sent to the supplier. Employees are paid every two weeks. Passengers may purchase a multi-ride monthly pass. Each of these activities involves an exchange between the transit property and an outside organization or person. These transactions involve the expenses associated with providing the transit service and revenues received from users in exchange for the service. The information from recording transactions makes it possible for the transit system to meet its legal obligations (paying suppliers and employees for services rendered).

The recording and summarizing of transactions also provides information on the financial status of the organization. For-profit organizations use this information to report net income, to pay income taxes, and to distribute profits (dividends) to their owners. Publicly owned transit systems use financial information in applying for funding assistance from various government agencies. Thus, financial accounting information provides a measure of financial performance or position. This can be over a period of time (Statement of Revenues, Expenses, and Public Assistance) or at one point in time (Balance Sheet). This information is used internally by transit managers and externally by, for example, government agencies providing financial assistance to the transit property.

Accounting information also provides an internal control mechanism for protecting assets. Ensuring that cash fares are correctly accounted for and that the cash is properly deposited is one aspect of this control process. Other assets (for example, tools, parts inventories, and fuel) can be similarly safeguarded through the control process. Transaction information can be used to ensure that adequate supplies are maintained (see Maintenance and Inventory Control, below) as well as to limit the possibility of misappropriation of the transit system's physical assets.

Operating Statistics Systems

In addition to generating financial information from its transactions, a transit property may also collect other statistics about those transactions. These operating statistics are typically measured in non-financial terms (e.g., passengers, miles, gallons, etc.). For example, information on passenger boardings/alightments, ridership levels, operator platform hours, and fuel consumption are just a few of the possible operating statistics that can be obtained from the transactions. Once collected, this information may be used to monitor the performance of the transit property (discussed later in this chapter).

Planning Systems

Transaction information may also be used for planning purposes such as trying to estimate the transit property's cash position at the end of the next quarter. A cash forecast relies on accounting system data to determine the current cash position of the organization. Data collected by the accounting system on previous transactions (cash inflows and cash outflows) is used as a basis for future transactions, with adjustments made for known changes in cash flows. An hourly wage increase that goes into effect on the first day of the current financial quarter would be an example of a known change. A cash forecast can indicate in advance the need for short-term borrowing of cash or surplus cash that can be invested in a short-term account.

On a broader level of planning, the preparation of other financial plans or budgets also relies on accounting system information. As stated earlier, the budget process may begin with financial information from previous periods. The accounting system summarizes transaction data for use in establishing a new budget. In preparing a budget a manager should include any known (or likely) changes in the inputs. For example, the impact of a planned increase in service or off-peak fare reduction needs to be considered during the development of a budget. A useful feature of computerized information systems is that a manager can explore the effect of different assumptions in generating financial plans. Using the so-called "what if...?" capability, a manager can simulate the overall impact on the transit system of, for example, various strategies for using part-time vehicle operators, and can experiment with different levels of service.

Attempting such a task using a manual system would involve extensive, time-consuming calculations.

Financial plans may also be used in conjunction with current accounting data to measure actual performance relative to planned (or budgeted) performance. This provides a means for controlling the financial position of the transit system. It is a mechanism by which changes can be made in operations during a fiscal period, rather than waiting until the fiscal period ends.

Performance Measurement Systems

Data from financial transactions (revenues and expenses) can be combined with other types of data to provide measures of performance of the transit system. For example, dividing operating cost by the number of revenue vehicle miles gives the cost per revenue vehicle mile. Through cost allocation procedures this analysis can be done for the entire system, a division, or for a specific route. Such calculations allow for comparisons and identification of "problem" areas that require further management attention.

Payroll Systems

Information systems can be designed to handle other transaction processing and information requirements of an organization. Payroll systems were among the earliest business systems to be computerized. Data collection and processing of hours worked and applicable rates of pay, as well as the various withholding requirements (income taxes, FICA, insurance, garnishments, etc.) tend to be fairly large scale and routine tasks well-suited to computerization. Payroll systems provide earnings-related information to the employee and various government agencies. The transit property can obtain a variety of information on labor costs and labor resources that have been used (e.g., employee hours) from such a system.

Personnel Systems

A personnel information system is extensively involved with an organization's employees, although in a different manner than the payroll system. Payroll systems focus on employee compensation, whereas personnel systems include a wider range of information, much of it historical in nature. For example, a personnel information system may contain information on an employee's promotions, disciplinary actions, seniority, qualifications (special skills, courses taken, licenses obtained, etc.), and other relevant information. A personnel information system can also be used for information pertaining to job applicants. Chapter 6 of this handbook deals with personnel management and offers further coverage of this topic.

Maintenance and Inventory Control Systems

Maintenance and inventory control systems are another type of information system. Keeping accurate records that are accessible to all employees who need the information is one purpose of a maintenance and inventory control system. Maintaining a parts and supply inventory requires information on the status (amount in stock) of inventory items so that revenue vehicles do not sit idle because the parts needed to repair them are not available. Disbursements (use of items) and replenishment (receipt of additional units) also need to be controlled for an inventory system to operate properly. Preventing the misappropriation of inventory items is another function of the inventory control system. Accurate and timely information is an important aspect of the control necessary for the maintenance activities of a transit property. It is also essential to keep accurate records of vehicle maintenance histories so that you do not have to rely on a mechanic's memory of when a particular mechanical component on a particular vehicle was last replaced. Chapter 7 of this handbook deals with maintenance.

Scheduling and Routing Systems

A transit property needs to design its service offering (routes, schedules, etc.) in order to provide an attractive product to its customers (riders) at a reasonable cost. Data on existing ridership patterns and untapped passenger markets are useful in developing the service offering. Information about constraints the transit system faces is also useful. These constraints may be related to the physical characteristics of the service area such as street patterns, terrain, and traffic congestion. Other constraints involve vehicle availability and labor contract provisions that govern the work activities of employees.

Designing routes, allocating vehicles to routes, and assigning vehicle operators to pieces of work are complex tasks for any transit property operating more than a few vehicles and running for more than one straight eight-hour period per day. These run-cutting activities have traditionally been accomplished through manual procedures using lots of paper, plenty of sharp pencils, and many erasers. Each scheduler developed his or her own procedures and tricks for cutting runs. It was generally difficult to measure how good a particular schedule was and few, if any, alternative schedules were developed by the scheduler because of the extensive effort required.

Proprietary software programs are now available for use in run-cutting and scheduling activities. These computer packages are intended to aid transit managers in making decisions about the transit property's service offering. Regardless of whether manual-based or computer-based scheduling and run-cutting methods are used, the transit property still needs to collect the needed information from a variety of sources.

Rider Information Systems

Rider information systems provide information to a transit property's riders and potential riders. Such systems provide information in a variety of forms. The production and distribution of printed matter such as system maps, route schedules, and timetables are one broad type of information useful to a transit system's customers. The development of these materials requires information generated by several units of a transit system.

Another way to provide information to riders is through a customer service telephone number. By calling this number, customers can get answers to questions on travel (route, bus stops, schedule time, and fare). Depending on the size of the transit system, this information may be provided by specialized customer information telephone operators or by the general office personnel as part of their normal duties. More sophisticated (and costly) customer information programs rely on computers with mechanical audio devices to provide service frequency information.

In addition to providing information to transit users, rider information systems can also serve to collect information from riders. Customer complaints, as well as compliments, provide valuable feedback to the transit property. A rider information system offers an organized approach to capturing this information.

Integration of Information Flows

In a relatively small organization, it is possible for a few employees to have an adequate grasp of all the information pertaining to the relatively limited activities of the organization. There is likely to be an informal approach to management and the exchange of information. The manager is usually "in the trenches" with the employees, so he or she is keenly aware of everything that occurs.

Larger organizations usually have specialized functional departments, that focus on one aspect of the organization's activities (e.g., operations, marketing, maintenance, finance, etc.). There are also several levels of management personnel, with the general manager at the top of the organizational structure. It is not possible for such managers to be as deeply involved in the various functions of the organization. Furthermore, the performance of these activities may be spread out over time (services offered for more than one eight-hour shift per day) and/or spread out over a geographic area (multiple routes, maintenance facilities, etc.).

One function of management is to coordinate all of these activities and have a perspective on the entire range of the organization's activities. A manager requires information as

part of the process of controlling an organization. The manager does not need to know the details of each transaction. Rather, the manager receives transaction information in a summarized format. For example, such information is reported in terms of revenue per route rather than in terms of specific passenger boardings and alightments. Similarly, fuel dispensed per garage per day might be such a summary report. An exception to this presentation format is the so called exception report. These are otherwise routine transactions or activities that exceed a certain boundary and therefore require the specific attention of individuals higher up in the organizational structure. Excessive oil usage by a particular vehicle would be an example of such an exception. It is up to managers to establish the boundaries for such exceptions. As discussed earlier in the chapter, the higher the level in the organization, the more summarized will be the information used by persons at each level.

Information is generated by the various functional units of an organization, and summarized and integrated across functional departments for the control and decision-making activities of managers. As information of importance to managers is generated throughout an organization, coordinated efforts must be made to collect, process, and disseminate that information. The required information needs to flow to decision-makers. Those decisions should be communicated to employees affected by such decisions. As previously discussed, selected information also needs to be made available to external users of information. This can be accomplished by an information systems approach.

Analyzing the types of information required by various units in the organization and determining the best way to collect, process, and distribute that information is part of the management information system approach. This approach involves the activities and procedures for collecting the information. Also included is the software (computer programs) for processing this information (mathematical analysis, sorting, summarizing, etc.). The third aspect of a management information system is the hardware (e.g., computers and communications links) that physically permit the processing to occur and allow the storage and dissemination of the information.

Computers are not required for a management information system. Manual data collection procedures can be developed, hand calculations ("software") can be performed on the data, and the results reported using a typewriter ("hardware"). Given the volumes of data generated and the typically repetitive nature of the transactions, computerized information systems accomplish the information processing tasks quicker, easier, and at a lower overall cost.

Summary

Detailed coverage of the various information systems is beyond the scope of this handbook. Interested readers should consult an accounting textbook for the concepts involved in

accounting systems. Textbooks are available on setting up bookkeeping systems (the actual recording of transactions) and on the preparing and presenting various types of financial reports. Transit systems may select the so-called manual systems that rely on paper records, calculators or adding machines, and hand or typewritten recording. Computerized accounting systems are now available for microcomputers, and are very affordable.

Further discussion on the other information systems mentioned above is also beyond the scope of this chapter. As previously noted some chapters of this handbook deal specifically with one of these topic areas (e.g., Chapter 7, on maintenance). In addition, numerous textbooks in the specialized business fields of inventory management, personnel management, performance measurement, and other management functions provide a more thorough discussion of a topic than is possible here. The business sections of your local library and bookstore are suitable places to seek further information on these topics.

Additional assistance about microcomputer applications may be available from your state public transit agency, the American Public Transit Association (APTA), and the Transit Industry Microcomputer Exchange (TIME). TIME, a federally sponsored microcomputer users group for transit operators, can be contacted at:

TIME Support Center
Dept. of Civil and Environmental Engineering
Vanderbilt University
P.O. Box 1563, Station B
Nashville, TN 37235
(615) 343-3436

Federal Reporting Requirements: Section 15

Section 15 of the Urban Mass Transportation Act of 1964, as amended, requires that financial assistance by UMTA under Section 9 of the Act can only be provided if the recipient has complied with a reporting system required by the Secretary of Transportation. This reporting requirement applies to the applicant for a grant and to any beneficiaries of the federal assistance. A reporting system has been developed which is designed to meet the needs of the federal government (UMTA), transit properties, non-federal government agencies (state and local), researchers, and the general public. This system is now officially called the Urban Mass Transportation Industry Uniform System of Accounts and Records and Reporting System. It is more commonly referred to as "Section 15."

The Section 15 reporting system developed out of voluntary efforts by the transit industry to collect financial and operating statistics on itself. The Financial Accounting and Reporting Elements (Project FARE) was an attempt in the early

Reporting Elements (Project FARE) was an attempt in the early 1970s at designing a standardized method for collecting such statistics from individual transit systems. Project FARE has evolved into the Section 15 reporting system.

The Section 15 reporting system can be very complex in its requirements. UMTA has published several documents to aid transit properties in meeting these requirements. In addition, UMTA periodically issues circulars designed to provide assistance and guidance. The interested reader should consult the applicable references shown at the end of this chapter and also contact UMTA. A brief overview of the Section 15 reporting system follows.

Reporting Levels

There are two formats to the Section 15 reporting requirements. One is the mandatory reporting system, known as level R, which requires certain information to be reported by each transit system. Level R provides the minimum level of detail. The other reporting format is the voluntary reporting system, which consists of three reporting levels based on the size of the transit property.

The three voluntary levels are:

- Level A - suggested for systems with 100 or fewer revenue vehicles.
- Level B - suggested for systems with between 101 and 500 revenue vehicles.
- Level C - suggested for systems with more than 500 revenue vehicles, and for all rapid rail systems.

The level of reporting detail increases from Level A to Level C. Each of the three voluntary levels satisfies the mandatory requirements of Level R. A property must meet, at a minimum, the mandatory reporting requirement (Level R). It may file at any other level (above, below, or at) the level which it is categorized based upon the number of revenue vehicles it operates. The number of revenue vehicles is measured in terms of the primary mode of operation of the transit system. (For example, motor bus, demand response, vanpool, etc.)

Reporting Forms

Information for the Section 15 requirements is collected on a number of different forms depending on the reporting level. The primary differences between Level R and the three voluntary levels involve the amount of detail required in the Revenue Report Forms and the Expense Report Forms. Five groups of forms are used in the Section 15 reporting system.

Basic information report forms. (000 series) This series of forms is used to collect information on the size of the transit property (e.g., peak vehicles, fleet size, etc.), modes operated, and various operating statistics (e.g., vehicle revenue miles, passenger miles, etc.).

Capital report forms. (100 series) These forms request information on the assets, liabilities, and capital position of a transit property. The forms include a balance sheet and a sources of capital statement.

Revenue report forms. (200 series) These forms are used to collect information on the various sources of revenue used by a transit property (e.g., fares, local taxes, state and federal assistance, etc.). The detail which revenues are reported by different classes is greater for the three voluntary levels than it is for Level R.

Expense report forms. (300 series) These forms contain information on the expenses incurred by a transit property and attempt to classify the data with varying detail depending upon the reporting level.

Non-financial operating data report forms. (400 series) This series of forms collects information on a wide range of operating statistics, (e.g., daily service period, maintenance performance, employee levels, accidents, revenue capacity miles, passenger miles, vehicle fleet size, etc.).

UMTA issues an annual Section 15 report. This report is compiled from the data submitted by public transit systems subject to the Section 15 reporting requirements. The annual report presents aggregate transit industry statistics as well as detailed financial and operating data on each individual transit system. The annual report is available in printed format and also in a machine (microcomputer) readable format. Data are also available on magnetic tape. For further information, contact:

Transportation Systems Center
DTS-49, Kendall Square
Cambridge, MA 02142
(617) 494-2541

The Section 15 reporting system has evolved into a means for governmental agencies to collect information necessary for the various transit assistance programs. It provides a process for verifying the funding requirements of a given transit system. It also provides a method for the transit industry to obtain data about itself. Such information can be used by the transit industry in making the public aware of its role in our overall transportation system. Section 15 statistics can be used by transit managers to compare the performance of their transit

system to that of other systems with similar characteristics (service area, ridership level, fleet size, etc.). This form of performance measurement and peer comparison can be a powerful management tool when properly used. Researchers also use the Section 15 data in their study of public transit. Such data can be used to identify the characteristics of better performing transit systems and to spot trends over time. Results of research can then be applied by transit professionals in management of their transit systems.

During the current revision of this handbook active efforts were underway by UMTA and the transit industry to modify various aspects of the Section 15 reporting system. In order to get the most recent information and requirements for the Section 15 reporting system, the interested reader should contact:

Information Services Staff (URT-7)
Urban Mass Transportation Administration
400 Seventh Street, S.W.
Washington, DC 20590
(202) 366-9157

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