

THE EFFECT OF ORGANIZATION SIZE AND STRUCTURE ON TRANSIT PERFORMANCE AND EMPLOYEE SATISFACTION

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16. Abstract <p>This research assesses the relationship between structural, attitudinal and performance variables in California public transit organizations. The structural variables were organizational size, span of control, number of specialties, administrative intensity, formalization, standardization and centralization. Their relationship was analyzed with attitude variables (job satisfaction and employee commitment) and organizational performance (efficiency and effectiveness measures and employee withdrawal).</p> <p>Questionnaire items, archival data, and interview information were collected from 16 transit organizations in California representing various sizes and types of organization. Statistical tests were used to determine what relationships existed between key structural attitudinal, and performance variables. The results were interpreted in reference to existing knowledge in organization behavior and organizational management. Implications for the design of transit organizations are discussed.</p>					
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PREFACE

This research had no immediate predecessor in the literature dealing with mass transit management. The basic foundations for this research emanate from the disciplines of industrial psychology, organizational behavior, and management. Applying concepts from these fields of research to the mass transit industry provided the research staff with an interesting and welcome challenge. Hopefully, such attempts at comprehending the nature of transit organizations and the people who manage them will encourage additional support and research into some of the complex and challenging issues which confront modern transit organizations.

The draft report was read by several people involved in transit management. The comments of William A. Boleyn, Washington Metropolitan Area Transit Authority; John T. Doolittle, Jr., Booz, Allen and Hamilton; Jack R. Gilstrap, Southern California Rapid Transit District; and George M. Smerk, Indiana University assisted the authors in preparing the final draft.

Fieldwork was restricted to 16 bus systems in California. Although the authors have preserved the confidentiality of information provided by each system, we would like to acknowledge the assistance received from the General Managers and staff managers from the following transit systems:

- AC Transit
- Fresno Transit
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- Montebello Municipal Bus Lines
- Monterey Peninsula Transit
- North County Transit District, Oceanside
- Orange County Transit District
- Sacramento Regional Transit District
- San Diego Transit
- San Mateo County Transit District
- Santa Barbara Metropolitan Transit District
- Santa Cruz Metropolitan Transit District
- Santa Monica Municipal Bus Lines
- South Coast Area Transit
- Stockton Metropolitan Transit District

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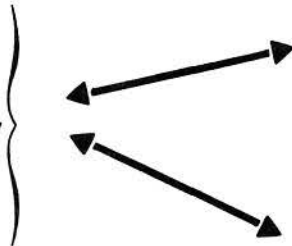
EXECUTIVE SUMMARY

The structure of organizations has long been of concern to both managers and organizational researchers. This report summarizes the objectives and results of research designed to assess the relationships between structural, attitudinal and performance variables in selected public mass transit organizations.

EXECUTIVE SUMMARY OF ANALYSIS

STRUCTURAL VARIABLES

- *organization size
- *span of control
- *number of specialities
- *administrative intensity
- *formalization
- *standardization
- *centralization



ATTITUDINAL VARIABLES

- *job satisfaction
- *employee commitment



ORGANIZATION PERFORMANCE

- *service efficiency
- *service effectiveness
- *employee withdrawal

Chapter 8 is a summary of findings with their implications for transit management. Managers of transit properties will find Chapter 8 more useful than the Executive Summary, because it seeks to apply the findings to the problems of management.

The term manager refers to more than the general manager of the transit system. It includes all employees having supervisory roles and includes supervisors of maintenance and operations. Interviews were completed with 239 managers in the transit systems selected for study.

PROBLEM STUDIED

This study investigated the relationships between structural, attitudinal, and performance variables in 16 fixed-route bus systems located throughout California. Data for the study was collected from organizational archives, personal interviews, management surveys, and on-site

observation. Statistical analyses focused on the associations between structural and attitudinal variables and elements of organizational efficiency and effectiveness. The largest transit system in California and other specialist transit systems were not included in this study.

SUMMARY OF FINDINGS

Transit organizations are associated with both employee attitudes and organizational performance that are consistent with organizational theory. In general, propositions which were made regarding transit organization structure; attitude and performance variables, based on research completed in other types of organizations, were supported. The terms used to describe organizational structure are defined in Appendix I.

Structural Relationships

The primary purpose of this analysis was to determine the overall effects of variations in transit organization and size on other structural features of organizations. It was anticipated that patterns of relationships could be established which would serve as guidelines for structuring organizations, pending subsequent analysis of structure-performance variables. Specific conclusions regarding the particular analyses were:

1. Organization size is positively associated with the number of subdivisions in the organization. Larger organizations tend to consist of more than one operating site, either due to the size of the geographical areas serviced or to the limited space available for vehicle maintenance and parking facilities. The main implication for this finding lies in the area of transit facility planning.

2. Increases in organization size lead to increased numbers of specialists and levels of specialization. As transit properties increase in size, management functions tend to become more specialized. Public relations specialists, planners, and finance and personnel managers are now commonplace. A consequence of this trend is the increasing dissatisfaction over inter-departmental coordination. Transit organizations which are expanding and becoming more specialized need to develop more

sophisticated communications systems and programs which facilitate and encourage intra- and inter-departmental coordination. Management By Objectives (MBO) approaches would be an appropriate means of gaining coordination.

3. Larger organizations tend to be characterized by "taller" management structures, i.e., more levels of management as well as more differentiation by departmental function. The results of our analyses indicate that once beyond a certain range of organization size, most transit organizations are characterized by a structure which includes between 4 and 6 distinct managerial levels, ranging from first-level supervisor to general manager. It appears to be the case that such levels of hierarchy are necessary in order to assure that each manager operates within a range of responsibility in keeping with his/her knowledge and capabilities.

4. Increased organizational size was associated with higher levels of both standardization and formalization. Certain rules and procedures appear to be standard across all sizes of transit organizations. Larger organizations tend to have higher levels of both formalization and standardization. Personnel codes and grievance procedures are formalized and cover managerial employees.

5. A negative relationship was found between organization size and degree of centralization of decision-making. Thus, as transit organizations grow, decision-making authority is delegated further down the ranks of management.

Structure Performance Relationships

The primary goal of this analysis was to establish the associations between various structural aspects of transit organizations and certain measures of organizational performance. Three efficiency and six effectiveness measures were used as standard performance indicators together with measures of employee absenteeism and turnover. Specific conclusions regarding the particular analyses are presented below.

1. Organization size was not strongly related to the performance measures. Although a good deal of interest has focused on the issue of

how the size of an organization may influence various aspects of organizational success, a clear pattern of relationships did not emerge. Several interesting observations can be made based upon the statistical analyses and discussions with the general managers of each property. Larger organizations tend to be more effective due to the increased scale of operations. However, it appears that, in the transit industry, an organization which emphasizes effectiveness goals almost invariably does so at the expense of efficiency. One example of this is found in the association between the degree of specialization in larger organizations and total organizational costs. While higher degrees of specialization may achieve increased ridership and market penetration (effectiveness indicators) these increased degrees of specialization do not appear to be related with any significant increased levels of efficiency. In fact, they represent significant costs to the production of service.

One factor which affects organizational performance measures is the total number of managers in the organization. Transit organizations characterized by "lean" management staffs generally exhibit higher levels of both efficiency and effectiveness. It is hard to determine exactly which new types of specialized activities are essential as an organization increases in size. It was apparent in the site visits that certain general managers were more inclined towards "leaner" management staff. The result was that each manager performed functions which, in organizations characterized by more specialist functions, might be delegated to separate staff personnel. While the effects of such a policy did not seem to adversely affect overall organizational effectiveness, organizational efficiency increased significantly.

2. The degree of centralization was positively associated with two measures of efficiency, three measures of effectiveness, and was negatively associated with levels of turnover for both managers and bus drivers. No single structural variable was characterized by as many significant relationships with performance measures as was the degree of centralization. One factor which seems to moderate this relationship is the job technology which characterizes the work environment. In the transit industry, this technology can be described as relatively stable,

even static. Such conditions of stability seem to be more conducive to a centralized management structure.

3. Transit organizations which are characterized by extreme levels of formalization were found to exhibit higher levels of employee turnover. Also, excessive formalization was negatively correlated with two effectiveness measures. These results are difficult to interpret, because some formalization is required in most organizations. Transit managers must determine what level of formalization is appropriate for different departments. They should also keep under careful scrutiny employee impressions and attitudes about rules and procedures. There are some departments and personnel who want (and sometimes require) a highly formalized work environment; others respond to less formalization.

4. Manager's length of employment or job tenure was associated with higher degrees of organizational performance. In fact, individual organizational averages of managerial work force experience were correlated highly with two efficiency and five effectiveness indicators. The amount of management experience which managers had in other types of organizations (including transit organizations) does not appear to have as great of an overall impact as the total amount of time each manager has spent in his/her present organization.

Structure-Attitude Relationships

The purpose of these analyses was to determine the associations between certain structural characteristics and employee attitudes (job satisfaction and commitment measures). Many of these analyses provide examples of how variations in organization structure can influence behavior.

1. Overall organization size was found to relate to more positive levels of job satisfaction and significantly higher organizational commitment on the part of transit managers. Larger organizations seem to be related positively to job satisfaction and thus to the employee's tendency to stay on the job rather than leave the organization. Again, it should be emphasized, that an additional component of organizational size is the size of the subunits, or departments, that make up the total

organization and constitute the immediate work environment of the individual manager. An organization may be extremely large, yet be made up of extremely small work units or teams, which would have extremely high morale. Conversely, a relatively small organization might consist of several large work units in which satisfaction and commitment are extremely low. Previous research suggests that the size of subunits within organizations and their effects on job satisfaction should be considered by transit managers when altering organizational structure.

At present, it seems safe to state that size has a variable impact on behavior. It probably acts in combination with other organizational properties in affecting behavior. Size is a fairly static condition, and more dynamic indicators appear to be better predictors (e.g., number of levels in management hierarchy).

2. Analysis of the effects of vertical span on attitudes is interesting, but, like the size factor, it does not appear to be as important as some of the contextual variables. Vertical span or "shape" refers to the number of hierarchical levels in an organization. This is not to say that shape has no importance in predicting behavioral consequences, but that it is one of the numerous features and dimensions that is inter-related. Transit managers need to diagnose how employees are influenced by shape, if at all, before reaching a conclusion concerning organization control.

3. Manager's span of control was positively associated with measures of both job satisfaction and organizational commitment. Thus, considering the relatively stable technology of transit organizations, wider spans of control seem to be conducive to positive employee attitudes. Extremely "tight" or narrow spans of control, especially at the lower management levels should be discouraged in fixed-route transit systems.

4. Managers job level was found to be significantly associated with the amount of both job satisfaction and organizational commitment. Upper-level managers expressed greater satisfaction and commitment than lower-level managers. The implication of this finding for managers centers around the focus of efforts to improve managerial attitudes. Perhaps upper-level managers require less attention concerning their levels of satisfaction and commitment. Efforts on the part of management

to improve employee attitudes might best focus attention on lower and middle-level managers.

5. Analyses of the data indicate a slight positive relationship between the degree of centralization and both commitment and satisfaction. This finding adds further support to the proposition that transit organizations, with their relatively stable technology are suited to more centralized organizational structures.

6. The importance of both standardization and formalization was again reinforced in this analysis. Both variables were positively associated with the satisfaction and commitment measures.

Considering the nature of the transit manager's tasks, a certain degree of formalization should be considered. However, the relationship between formalization and attitudes is not linear. Extremely low or high levels of formalization will more than likely result in disfunctional behaviors and a decline in employee attitudes.

7. Transit managers in our sample expressed greater degrees of organizational commitment in relation to the length of service they had achieved in their respective organizations. This finding again supports the value of employee retention in fixed-route transit organizations.

Attitude - Performance Relationships

The primary purpose of the analyses was to determine the association between managerial employee attitudes (job satisfaction and organizational commitment) and organizational performance.

1. The general results of the analyses between managerial employee attitudes and organizational performance support the concept that the two are definitely related. The discussion in the literature of the direction of influence (i.e., does attitude "cause" performance or vice versa) indicates that attitudes and performance may influence each other. This discourages statements regarding the direction of the causal linkage.

Associational analysis makes one point clear; greater degrees of managerial satisfaction and commitment are positively associated with increased levels of organizational performance. This has profound implications for transit managers regarding the attention given to employee

attitudes. Concern for efficiency and/or effectiveness, when combined with a concern for employee attitudes, would seem to produce an optimal strategy for improving overall organizational performance.

CONCLUSION

The most important result of the analyses is that the impacts of structural variables upon employee attitudes and organizational performance need to be assessed in an interactive framework. No single structural variable appears to be critical in terms of attitudes and/or performance. Several structural variables, when considered together or as influenced by some moderating variable may have more significant impacts on organizational outcomes than the impact of these same variables considered individually.

Some of the more important analyses highlighted particular variables as having a closer association with various attitude and performance measures. Also, the "one best way to manage" approach to organizational design has not received any support in this analysis. Important implications for transit managers include specifying more "crucial" variables for analysis as well as emphasizing certain "ranges" or "levels" of variables which tend to be associated with positive attitudinal and/or performance outcomes.

CHAPTER 1

ORGANIZATIONAL SIZE AND STRUCTURE AND ITS RELATION TO ATTITUDES AND PERFORMANCE: AN OVERVIEW

Performance and productivity measurement has received some attention in the recent transit literature. Herringer, in his discussion of the Urban Mass Transportation Administration's (UMTA) commitment to effective transit management, states that transit managers need to know more about the components of efficiency at each level of transit operations.¹ He emphasized that ". . . better information and evaluative tools will provide transit managers with increased facility for isolating problem areas and developing solutions" (p. 31).

Other researchers have stated that most transit properties in the United States probably don't have up-to-date or accurate organization charts, i.e., a formal picture of their organizations.² One of the goals of this study is to help "fill the gap" in terms of identifying organizational structure characteristics which may play an important part in determining organizational effectiveness and efficiency. Various transit properties in the state of California have been analyzed with respect to their structure as well as the attitudes of the respective management staffs. This information will then be analyzed by examining

¹F. C. Herringer. "The UMTA Commitment to Effective Transit Management," Transit Journal, Vol. 1, No. 1 (February 1975), pp. 27-52.

²G. M. Smerk. "The Transit Industry: What's Right and What's Wrong," Transit Journal, Vol. 2, No. 3 (August 1976), pp. 31-44.

certain relationships between organizational structure, employee attitudes, and various measures of organizational efficiency, effectiveness and productivity. (A more detailed discussion of the variables which will be examined and the specific relationships which will be studied will follow later in this chapter.) A comprehensive literature review was completed in conjunction with the present research. This Initial Task Report presents a thorough review of relevant research on organizational structure, attitudes and performance. Also, specific trends in research which are mentioned briefly in this report are explicated in more detail in the literature review.

Research in the mass transit industry is particularly valuable and timely since it offers the opportunity to examine a variety of organizations (representing a broad range of situational characteristics) in the same industry. It is possible to explore structural characteristics common to the transit industry and to examine the impact of situational characteristics on the relationships between structure and attitudes and structure and performance. Analyses of this type will be valuable to the field of organizational behavior as well as to the study of transportation management.

The Concept of Organization

Throughout most of recorded history, bureaucracy has been widely accepted as the most efficient, equitable, and least corruptible form of organization.³ Bureaucratic structures have a history that reaches

³J. Child. Organization: A Guide to Problems and Practice. London: Harper and Row, 1977.

back to the administration of ancient civilization, and still exists today in a more advanced form. The essence of this approach is the establishment of mechanisms of organizational control that ensure a high degree of predictability of employee behavior. "Bureaucratic structures are characterized by an advanced degree of specialization between jobs and departments, by a reliance on formal procedures and paperwork, and by extended managerial hierarchies with clearly marked status distinctions."⁴

Weber's writings on bureaucracy and the works of other early management theorists all offered the proposition that there is a single best way to organize for maximum organizational efficiency.⁵ Recent research however, has failed to support this contention. Burns and Stalker concluded that the predictability of the environment faced by the organization influenced its structure.⁶ Lawrence and Lorsch consider perceived environmental uncertainty to be an important contingency variable.⁷ In a study of one hundred firms in England, Woodward found the relationship

⁴Ibid., p. 12.

⁵M. Weber. Theory of Social and Economic Organization. Oxford: Oxford University Press, 1947. For earlier works in management theory see E. W. Taylor. The Principles of Scientific Management, Harper, 1911; H. Fayol, Industrial and General Administration, Pittman, 1930; L. Gulick & L. Urwick, eds. Papers on the Science of Administration, Columbia University Press, 1937; R. C. Davis, The Fundamentals of Top Management, Harper and Row, 1951.

⁶I. Burns and G. M. Stalker. The Management of Innovation. London: Tavistock Publications, 1961.

⁷P. R. Lawrence and J. Woodward. Organization and Environment: Managing Differentiation and Integration. Boston: Division of Research, Graduate School of Business Administration, Harvard University, 1967.

between structure and effectiveness to be influenced by the organization's production technology.⁸

Another variable which is believed to have a differential impact on organizational structure is size. Child argues that two processes are at work having similar implications for effective structural design.⁹ First, increasing size allows grouping of similar specialities within organizational subunits but creates greater differences or heterogeneity between subunits. Second, as the number of organizational members increases, the less possible it is to employ a personalized, centralized system of management. Thus, as size increases so do the requirements for control and coordination. This leads to the adoption of a more decentralized system with impersonal mechanisms of control and a need for more clerical and administrative personnel.

The previously mentioned studies are illustrations of research that reflects the "one best way" proposition of organizational design. They are also studies that provide impetus for current situational contingency theories. While an exhaustive review of contingency theory is beyond the scope of this study, there does appear to be a growing consensus for two general propositions of organizational design:

⁸J. Woodward. Industrial Organization Theory and Practice. New York: Oxford University Press, 1965.

⁹J. Child. "Organization structure, environment and performance: The role of strategic choice." Sociology, 1972, 6, 1-21. Also see J. R. Kimberly, "Organizational Size and the Structuralist Perspective: A Review, Critique, and Proposal." Administrative Science Quarterly, 1976, 21, 571-597.

1. There is no one best way to organize; and
2. Any one particular way of organizing is not equally effective in all situations.¹⁰

These two propositions along with the previously mentioned research form the basis for both the rejection of earlier management theories advocating the universal effectiveness of bureaucratic structures, and the foundation for various contingency theories of organization.

The Dimensions of Structure

The term "structure" embodies a variety of concepts. "Structure" may be subdivided into its component parts. These parts are referred to as structural dimensions. These dimensions are believed to be associated with the attitudes and the performance of organizations and their members.

One of the first dimensions of structure to be identified was span of control, i.e., the number of subordinates who report directly to a supervisor. Henri Fayol discussed this in 1949.¹¹ He considered five or six the maximum number a person above the level of foreman should supervise. A foreman in a situation where the task is routine and simple may supervise as many as twenty. In 1937, Graicunas showed how the number of possible interactions increases very rapidly when the number of members of the group increased, especially when the number exceeds six.¹²

¹⁰J. R. Galbraith. Designing Complex Organizations. Redding, Massachusetts: Addison Wesley, 1973.

¹¹H. Fayol. General and Industrial Management. London: Sir Isaac Pitman, 1949.

¹²V. A. Graicunas. "Relationship and Organization," in L. Gulick and L. Urwick (eds.). Papers on the Science of Administration. New York, Institute of Public Administration, 1937.

This, he argued, was good reason for keeping the span of control small. Worthy challenged this view, suggesting spans of control of fifty can be managed successfully.¹³ Span of control continues to be a dimension of interest in the study of structure.¹⁴

Another dimension which has received attention is the size of the organization. The size of the organization may be related to attitudes and performance.¹⁵ Large organizations usually have more complex structure than small organizations. This difference may impact the attitudes and performance of organizational members.

Aside from the above dimensions, most of the effort in this line of research has been directed at describing a set of dimensions that encompass the entirety of structure: to identify those aspects of structure which impact not only other structural variables, but attitude and performance as well. Sells, for instance, offered these dimensions: (a) size, (b) differentiation, (c) autonomy with respect to outside control, (d) control (centralization, flexibility, communication), and

¹³J. C. Worthy. "Organizational Structure and Employee Morale." American Sociological Review, 1950, 15, 169-179.

¹⁴Some of the more recent studies include those conducted by B. P. Indik, "Some Effects of Organization Size on Member Behavior and Attitude." Human Relations, 1968, 16, 369-384. F. A. Holdaway and T. A. Bowers, "Administration Ratios and Organization Size: A Longitudinal Examination." American Sociological Review, 1971, 278-286. M. W. Meyer, "Size and the Structure of Organizations: A Causal Analysis." American Sociological Review, 1972, 37, 434-441.

¹⁵Some of the more well-known studies concerning size have been conducted by L. W. Porter and E. E. Lawler, III. "Properties of Organization Structure in Relation to Job Attitudes and Job Behavior." Psychological Bulletin, 1965, 64, 25-52. T. Caplow, "Organization Size." Administrative Science Quarterly, 1969, 14, 178-191. O. Grusky, "Corporation Size, Bureaucratization, and Managerial Succession." American Journal of Sociology, 1961, 67, 261-269. E. S. Chapin, "The Growth of Bureaucracy." American Sociological Review, 1951, 16, 835-856.

(e) role structure.¹⁶ These dimensions were selected from a theoretical perspective without empirical study to justify the categorization.

Researchers have also presented sets of structural dimensions determined a priori by the authors. In many cases researchers who used this approach made less than comprehensive efforts to establish if there was empirical evidence of the existence of such properties, if the categories for classification were generalizable and parsimonious, or even if list of categories adequately encompassed the concept of structure. Two attempts worth mentioning which represent more sophisticated a priori attempts at identifying structural properties are those of Porter and Lawler as well as Hall, Haas, and Johnson. The former considered structural properties from both a total organizational perspective as well as a suborganizational perspective.¹⁷ The latter considered complexity, formalization, and size to be the critical dimensions.¹⁸

Another approach to the study of organizational structured variables has been to factor analyze a large group of variables that are considered important in order to isolate "clusters" of variables and label these groupings as major dimensions of structure.¹⁹ Although this approach

¹⁶S. B. Sells. "Toward a Taxonomy of Organizations." In W. W. Cooper, H. J. Leavitt, and M. W. Shelly, III (eds.), New Perspectives in Organization Research. New York: Wiley, 1964.

¹⁷L. W. Porter, and E. E. Lawler, III. "Properties of Organization Structure in Relation to Job Attitudes and Job Behavior." Psychological Bulletin, 1965, 64, 25-52.

¹⁸R. H. Hall, J. E. Haas, and N. J. Johnson. "Organizational Size, Complexity, and Formalization." American Sociological Review, 1967, 32, 903-912.

¹⁹G. H. Dunteman. "Organizational Conditions and Behavior in 234 Industrial Manufacturing Organizations." Journal of Applied Psychology, 1966, 50, 300-305.

is an improvement over earlier efforts, it has been criticized because it appears to take a collection of variables that have not been related theoretically, bring them together, and develop factors which are then given theoretical significance.²⁰

In what is probably the most important study of the dimensions of structure, Pugh, Hickson, Hinings, and Turner took an approach that falls somewhere between the above extremes.²¹ Starting from a conceptual base these authors proposed six primary dimensions of structure: specialization, standardization, formalization, centralization, configuration, and traditionalism.²² After extensive scale development sixteen scales were selected. These were subjected to principal component analysis using data from 52 organizations. Four components of structure were identified:

- (a) structuring of activities which included specialization, standardization, and formalization
- (b) concentration of authority which included centralization

²⁰L. R. James and A. P. Jones. "Organizational Structure: A Review of Structural Dimensions and their Conceptual Relationships with Individual Attitudes and Behavior." Organizational Behavior and Human Performance, 1976, 16, 74-113.

²¹D. S. Pugh, D. J. Hickson, C. R. Hinnings, and C. Turner. "Dimensions of Organizational Structure." Administrative Science Quarterly, 1968, 13, 65-105.

²²Many of the conceptual issues discussed by Pugh et al. were introduced by the following authors. W. M. Evan, "Indices of the Hierarchical Structure of Industrial Organizations." Management Science, 1963, 9, 468-477. J. Hage, "An Axiomatic Theory of Organizations." Administrative Science Quarterly, 1965, 10, 289-321. D. S. Pugh et al., "A Conceptual Scheme of Organizational Analysis." Administrative Science Quarterly, 1963, 8, 289-315.

- (c) line control of workflow which included elements of the configuration dimension, and
- (d) size of the supportive component which included elements of the configuration dimension that related to the staff and administrative components.

Other studies have used these primary dimensions as well as components of structure identified in studies of other organizations in several countries and found them useful.²³ This body of research generally supports the validity of the dimensions suggested by Pugh. Although further validation is desirable, these dimensions are among the best available. The widespread acceptance of them supports their use as the basis for the dimensions selected for this study.

The selection of dimensions for this study takes into consideration the nature of mass transportation and the nature of the relationships between the structural variables as presented in the literature. As a consequence, a wholesale adoption of any one set of structural dimensions has not been made. The following variables or dimensions of structure have been selected: organizational size, subunit size, span of control, number of specialities, vertical span, administrative/clerical intensity, formalization, centralization, standardization, and coordination. These are closely related to the dimensions discussed especially those identified in the Pugh et al. study. Formalization, number of specialities,

²³J.H.K. Inkson, D. S. Pugh, and D. J. Hickson, "Organization Context and Structure: An Abbreviated Replication." Administrative Science Quarterly, 1970a, 5, 381-329. J.H.K. Inkson, J. P. Schwitter, D. C. Pheysey, and D. J. Hickson. "A Comparison of Organizational Structure and Managerial Roles." Journal of Management Studies, 1970b, 7, 347-363. D. S. Pugh, D. J. Hickson, C. R. Hinnings, C. Turner. "The Context of Organizational Structure." Administrative Science Quarterly, 1969, 94-114.

and standardization have been utilized by Pugh. Span of control, vertical span, and administrative/clerical intensity are part of the Pugh dimensions of configuration. Moreover, centralization is used and coordination is captured in the larger dimension of concentration of authority. Although organizational size and subunit size have not been used by Pugh, these variables are often investigated by others.²⁴ Size is an essential dimension which, for purposes of this study, will be considered to be the primary structural variable.

Table 1-1 provides a more complete review of the dimensions of structure identified in the literature and an examination of the relationships among these dimensions. The dimensions of the present research are used as a basis for this comparison. Each column contains dimensions that represent similar components of structure which have been analyzed by the respective authors listed in the first column. Thus, in the present research, structural features of transit organizations were examined which would encourage comparison with previous research in various other types of organizations. Appendix I presents definitions of each dimension of structure. Various interpretations of the structural dimensions which have appeared in the recent behavioral science literature served as a basis for these definitions.

²⁴L. W. Porter and E. E. Lawler, III. "Properties of Organization Structure in Relation to Job Attitudes and Job Behavior." Psychological Bulletin, 1965, 64, 24-52. R. H. Hall, J. E. Haas, N. J. Johnson. "Organizational Size, Complexity, and Formalization." American Sociological Review, 1967, 32, 903-912. P. Blau and R. Schoenherr. The Structure of Organizations. New York: Basic Books, 1971.

TABLE 1
DIMENSIONS OF STRUCTURE

Present Review	Size	Span of Control	Vertical Span	Administrative Intensity	Specialization	Formalization/Standardization	Centralization
Hall 1962					Complexity	Formalization/Specialization	
Porter & Lawler 1965	Size	Span of Control	Org. Levels Flat/Tall				Centralization
Hall et al. 1967	Size				Complexity	Formalization	
Pugh et al. 1968		Configuration			Specialization	Formalization/Standardization	Centralization
Indik 1968	Size	Span of Control	# of Hierarchies		Task Specialization	Task Specification	Authority Structure
Sells 1968	Size				Differentiation	Role Structure	Control Autonomy
Hickson et al. 1969		Line Control of Work			Structuring of Activities		Concentration of Authority
Inkson et al. 1970a,b					Structuring of Activities		Concentration of Authority
Prien & Ronan 1971	Size				Extent of Technology	Formalization/Standardization	Centralization of Authority
Child 1972			Vertical Span		Specialization	Documentation Standardization	
Payne & Mansfield 1973		Subordinate ratio	Vertical Span		Role Specialization	Formalization/Standardization	Centralization
Hrebiniak 1974		Closeness of Supervision				Extent of Rule Usage	Control, Autonomy Participation
James & Jones 1976	Size	Configuration			Specialization	Formalization/Standardization	Centralization

OVERVIEW OF THE REPORT

This report is divided into three parts. Part I (Chapters 1, 2, and 3) includes a general introduction to the research project, a review of the sampling and data collection procedures, and a summary of the transit performance indicators which will be used in the study.

Part II focuses on the various analyses performed with the information which was collected on the transit site visits. Chapter 4 considers the relationships among the structural components of the transit organizations which were visited. Among the issues considered in this chapter is the impact of organizational size on certain other structural factors such as span of control, vertical span, and administrative intensity. Chapter 5 examines the relationship between the structural characteristics of the transit properties and the attitude measures which were collected. The attitude items which were analyzed measure the job satisfaction and commitment of transit employees. Several hypotheses which have been proposed in previous organizational research concerning organization size and attitudes will be examined in this section. The analysis of the effects of structure on transit performance will be discussed in Chapter 6. The primary analysis that will be included in this section will be correlations of the structural variables with the performance indicators. Chapter 7 will include a similar analysis of the relationship between the attitude measures and the performance indicators.

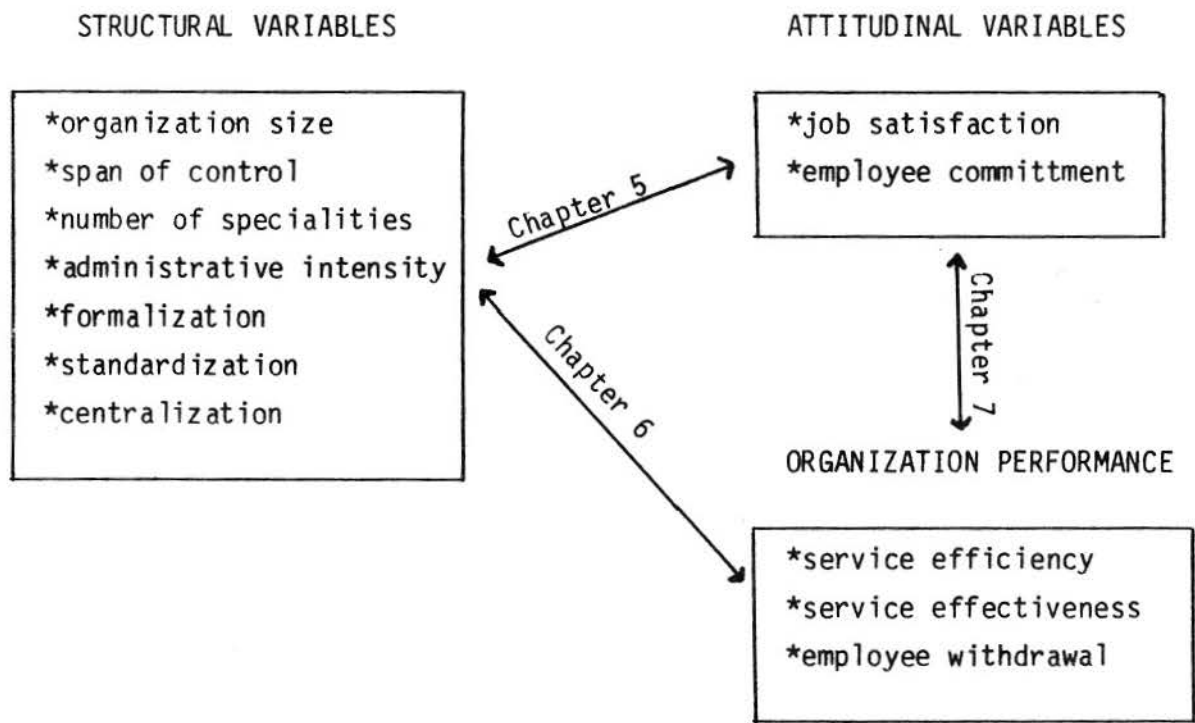
The Summary of Findings and Implications of the research (including a summary of the Intermediate Progress Report) are presented in Part III.

In this section many of the results presented in the previous four chapters will be assimilated into a final statement concerning the state of affairs in the organizations studies as well as implications for the design and management of other transit organizations.

Figure 1-1 presents a summary of the various analyses which will be performed in Chapters 5, 6, and 7. As indicated by the illustration, several important relationships are eligible for analysis. Previous research performed in various types of organizations has suggested certain patterns of relationships between these categories of variables. Findings from these studies have been useful in applications ranging from organization design to performance measurement. Analysis of these variables in transit organizations should help to confirm or question the existence of some of these proposed key linkages. The initial task report (Literature Review) completed for this research provides a comprehensive summary of the most significant research which has examined the relationships between structure, attitudes, and performance.²⁵

²⁵D. R. Dalton, G. J. Fielding, L. W. Porter, M. J. Spendolini, and W. D. Todor. The Effect of Organization Size and Structure on Transit Performance and Employee Satisfaction: A Literature Review. Initial task report prepared for U.S. Department of Transportation, Urban Mass Transportation Administration (Contract No. CA-11-0016-1), Institute of Transportation Studies, School of Social Sciences, and Graduate School of Administration, University of California, Irvine, August 1978.

FIGURE 1-1
SUMMARY OF ANALYSES TO BE PERFORMED IN CHAPTERS 5, 6 and 7



PART I
METHODOLOGY

CHAPTER 2

SAMPLING AND DATA COLLECTION PROCEDURES

Previous experiences with transit organizations have emphasized the difficulties of collecting accurate information, especially with regards to performance data (i.e., the effectiveness and efficiency indicators). The reason for most of the problems encountered in data collection lies in the fact that there are few standard reporting procedures for statistics, whether they be vehicle hours, or percent population served. While most general managers agree that some statistical reporting is becoming a fact of life in the transit industry, few have made efforts to compile figures which are either reliable or in many cases valid. Increasing demands for statistical information (which is becoming a required practice due to government agency policy) should result in the availability of more reliable data in the near future.

The process of gathering data for the present study began with the evaluation of the types of information which were considered relevant, available, and parsimonious. One of the major constraints which confronted the research team was the limited period of time which we could spend at each property. The main task when constructing the measurement instruments, then, was to mediate our concern for accuracy with a concern for the time available at each property. In general, though, our reception at each property was very encouraging and each general manager complied with our requests for various forms of information.

Selection of transit properties for inclusion in the project was limited to California. This constraint minimized travel and allowed us to take advantage of information gathered in previous studies. The Institute of Transportation Studies, Irvine, has been involved over the past several years, with the development of performance indicators for transit. These efficiency and effectiveness indicators were originally calculated utilizing statistical information from 47 California transit properties (fixed-route bus systems) as well as five from the State of Washington.¹ Since this study is an extension of the previous research it was decided to limit field work to California organizations which were included in the original report. These 47 properties provide a fairly representative sample of California transit organizations with respect to size, structure, and geographical location.

Because of time and cost constraints, the research team decided that extended interviews and other data collection procedures could only be conducted for 15-20 organizations. In keeping with our original research proposal concerning organization size, we attempted to select properties which would give us a representative sample of small, medium, and large organizations.

A total of 16 properties agreed to participate in the study. According to our typology, 7 of these properties were categorized as "small" (less than 50 units), 6 were classified as "medium" (50 to 200 units),

¹Gordon J. Fielding, Roy E. Glauthier, and Charles A. Lave. Development of Performance Indicators for Transit, Prepared for U.S. Department of Transportation, Urban Mass Transit Administration (Contract No. CA-11-0014-4), Institute of Transportation Studies and School of Social Sciences, University of California, Irvine, December, 1977.

and 3 were "large" (more than 200 units). Table 2-1 provides some descriptive information about the organizations which were included in the sample.

Site Visits

The site visits to transit properties took place over a five week period during the summer of 1978. Four researchers were involved in the data collection procedures with two-person teams visiting each property in most cases. Some of the larger properties were visited by all four researchers to expedite the data collection procedures. Each property was contacted several months in advance regarding the purpose of the research and the types of information which would be required. The research team received excellent cooperation from the general managers of each organization.

Upon arrival at each property, data collection tasks were divided among the researchers. Three main activities characterized the data collection efforts: conducting extended interviews with the general manager of each property, collecting archival data concerning the organization's structural and operating characteristics, and distributing and collecting the transit manager surveys. Each of these three processes are discussed in some detail later in this chapter.

A good deal of time was allocated for describing the measurement instruments as well as the research objectives to the individual managers in our sample. The research teams wanted to insure that each participant in the study had a clear understanding of the types of issues which we were confronting in this research. This process also encouraged a

Table 2-1
 Characteristics of Sample Transit Properties

<u>Total number of employees</u>			
	<u>Small*</u>	<u>Medium**</u>	<u>Large***</u>
Mean	68	300	1,316
Standard Deviation	21	102	527
<u>Total number of operating vehicles</u>			
	<u>Small</u>	<u>Medium</u>	<u>Large</u>
Mean	36	153	504
Standard Deviation	10	42	236
<u>Operating Expense, 1977-78 (estimated)</u>			
	<u>Small</u>	<u>Medium</u>	<u>Large</u>
Mean	1,594,940	7,882,598	33,877,910
Standard Deviation	464,079	2,803,595	13,781,506
<u>Service Area Population</u>			
	<u>Small</u>	<u>Medium</u>	<u>Large</u>
Mean	194,318	447,880	1,507,369
Standard Deviation	45,744	155,518	22,981
<u>Percent Population Served</u>			
	<u>Small</u>	<u>Medium</u>	<u>Large</u>
Mean	78.2	81.8	86.0
Standard Deviation	9.8	13.0	7.9

Table 2-1, continued

<u>Revenue Passengers (1976-1977)</u>			
	<u>Small</u>	<u>Medium</u>	<u>Large</u>
Mean	2,235,156	9,617,256	33,678,828
Standard Deviation	833,381	3,805,006	19,537,896
<u>Total Passengers (1976-1977)</u>			
	<u>Small</u>	<u>Medium</u>	<u>Large</u>
Mean	2,632,840	10,360,252	37,552,487
Standard Deviation	845,284	3,466,608	17,938,924

*Small defined as 50 buses or less.

**Medium defined as greater than 50 but less than 201 buses.

***Large defined as greater than 200 buses.

"dialogue" between the researchers and the managerial participants; a factor which is missing in many research efforts. Through these discussions, the research teams were able to establish an informal "property profile" which greatly enhanced our ability to explain certain anomalies which surfaced in our formal data analysis.

Most site visits involved two days. This gave the managers a chance to personally return the materials to the researchers. This procedure resulted in a high return rate of the surveys (approximately 85%).

The goal in this project was to distribute a survey to each manager in every organization from the general manager down to (and in some cases including) the supervisory level. This provided the team with a valid profile of each organization. In all but one organization we were successful in collecting a sample representative for each organization's managerial staff. In some cases involving smaller properties we obtained responses from the entire management staff. In general, our sampling goals were met. Only one property was deleted because the response rate was so low as to preclude obtaining a valid profile of the organization.

Descriptions of the Data Collection Instruments

Information about each property was collected using three measurement instruments: a semi-structured interview with the general manager, a transit structure survey which was completed by all managerial personnel, and an archival records form which was completed for each property. In the process of selecting each measurement instrument, measures which have

already been developed and tested in other organizations were used wherever possible. This practice was followed in order to increase the reliability of the survey instrument. When existing measures were not available, special scales and survey items were developed to suit the specific purposes of this research.

Transit Structure Survey

The primary data source was the Transit Structure Survey, which was distributed to each managerial employee in all transit properties. The survey consisted of three sections. The first section was used to obtain information on demographic-type variables for each individual. Sex, age, educational level, management training and experience, job tenure, and span of control items were included in this section. Table 2-2 represents some of the characteristics for the sample of transit managerial employees. Discussion of these characteristics will be presented at the end of this chapter.

Part two dealt with the individual manager's perceptions about three structural attributes of their organizations: standardization, formalization, and centralization. Standardization was used to measure manager's perceptions about the extent to which certain managerial tasks are governed by rules and regulations. The measure of formalization is used to ascertain the extent to which procedures in the organization are specified, either through explicit rules or by some type of standard operating procedure. The centralization scale attempts to establish the managerial level at which certain specific types of decisions are made.

Part three is concerned with current job attitudes and consists of two sections. The first section measures job satisfaction utilizing a 20 item scale extracted from the Minnesota Satisfaction Questionnaire (MSQ).²

The second section consists of a 15 item scale which has been developed to measure organizational commitment.³ All items which were included in the transit structure survey are listed in Appendix II.

All transit structure surveys were personally delivered to the management personnel by the research staff during the site visits. Managers were encouraged to return the completed surveys to researchers on the second day of the site visit. The majority of the surveys were returned personally by the managers who had completed them. In the case where a manager was not present on the site due to illness or vacation, an introductory letter was left in his/her office along with the survey. Special mailing envelopes were provided so that the individual manager could return the survey to the Institute of Transportation Studies. Also, when managers could not return the completed survey by the second day, the special mailing envelopes were left with the employee to return at his/her convenience. Envelopes which were left at the research sites were coded with a two-digit number which would identify the property from which it was sent. The return rate for those surveys that had to be mailed back to the Institute was 85 percent.

²Lloyd H. Lofquist and Rene V. Davis, Adjustment to Work. New York: Appleton-Century-Crofts, 1969.

³Lyman W. Porter, Richard M. Steers, Richard T. Mowday, and Paul V. Boulian. "Organizational Commitment, Job Satisfaction and Turnover Among Psychiatric Technicians." Journal of Applied Psychology, 1974, Vol. 59, 5, 603-609.

Interview Schedule

Interviews with the general managers were completed in every property except one in which the general manager was on vacation (interview was conducted with the assistant general manager). The interview was intended to provide an opportunity to establish a dialogue with the top manager concerning various aspects of the respective property's structure. Some of the topics which were discussed include structural history of the organization, influence of outside agencies, internal and external constraints on structure, perceptions of "goal-defining bodies" (e.g., boards, local political influences), the existence of goal setting activities, and questions relating to the management of transit in general.

The semi-structured nature of the interviews stimulated and encouraged extended discussions concerning issues of concern to the general managers. Recurrent themes which seemed to be shared by most top managers included the nature and scope of performance measurement, the institutionalization of more effective management practices, problems with funding transit through local, state, and federal agencies, and concerns for the future of transit. A discussion of some of the results of the interviews is contained in the Intermediate Report which was completed for this project.⁴

⁴William D. Todor, Dan R. Dalton, Gordon J. Fielding, Lyman W. Porter, Michael J. Spendolini, The Effect of Organization Size and Structure on Transit Performance and Employee Satisfaction. Intermediate Progress Report prepared for U.S. Department of Transportation, Urban Mass Transportation Administration (Contract No. CA-11-0016-2), Institute of Transportation Studies, School of Social Sciences, and Graduate School of Administration, University of California, Irvine, September, 1978.

Table 2-2
 Characteristics of Sample Transit Managerial Employees

<u>Sex</u>									
	<u>Total Sample</u>		<u>Small*</u>		<u>Medium**</u>		<u>Large***</u>		
		%		%		%		%	
Female	30	12.6	2	6.7	16	14.7	12	12	
Male	209	87.4	28	93.3	93	85.3	88	88	
<u>Age</u>									
	<u>Total Sample</u>		<u>Small</u>		<u>Medium</u>		<u>Large</u>		
Mean	41.1		41.3		38.3		43.6		
Standard Deviation	11.1		11.2		9.4		12.2		
<u>Race</u>									
	<u>Total Sample</u>		<u>Small*</u>		<u>Medium**</u>		<u>Large***</u>		
		%		%		%		%	
Black	16	6.7	1	3.3	10	9.2	5	5	
Asian	5	2.1	0	0	3	2.8	2	2	
American Indian	3	1.3	0	0	1	.9	2	2	
Spanish Surname	9	3.8	2	6.7	7	6.4	0	0	
White	204	85.4	27	90.	87	79.8	90	90	
None of the Above	1	.4	0	0	1	.9	0	0	
<u>Formal Management Education</u>									
	<u>Total Sample</u>		<u>Small*</u>		<u>Medium**</u>		<u>Large***</u>		
		%		%		%		%	
None	86	36.	14	46.7	26	23.9	46	46	
Professional Certificate	37	15.5	1	3.3	21	19.3	15	15	
Undergraduate Courses	62	25.9	6	20.	36	33.0	20	20	
Bachelors Degree	22	9.2	5	16.7	10	9.2	7	7	
Some Graduate Work	14	5.9	2	6.7	5	4.6	7	7	
Graduate Degree	15	6.3	2	6.7	9	8.3	4	4	

<u>Total Years Management Experience</u>				
	<u>Total Sample</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>
Mean	10.5	10.6	8.9	11.9
Standard Deviation	8.8	8.16	6.9	10.5

<u>Total Years Management in Present Organization</u>				
	<u>Total Sample</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>
Mean	5.8	5.1	4.4	7.8
Standard Deviation	6.3	3.9	5.3	9.7

<u>Total Years Management in Previous Transit Organization</u>				
	<u>Total Sample</u>	<u>Small</u>	<u>Medium</u>	<u>Large</u>
Mean	2.6	3.6	2.7	1.5
Standard Deviation	5.5	5.5	6.2	8.8

<u>Any Transit Management Training by Present Organization?</u>							
	<u>Total Sample</u>	<u>Small</u>	<u>%</u>	<u>Medium</u>	<u>%</u>	<u>Large</u>	<u>%</u>
Yes	130	18	60	55	50.5	57	57
No	109	12	40	54	49.5	43	43

<u>Job Level</u>								
	<u>Total Sample</u>	<u>%</u>	<u>Small</u>	<u>%</u>	<u>Medium</u>	<u>%</u>	<u>Large</u>	<u>%</u>
Upper Level	26	10.9	12	40	8	7.3	6	6
Middle Level	76	31.8	10	33.3	41	37.6	25	25
Lower Level	<u>137</u>	57.3	8	26.7	60	55.0	69	69
	239							

*Small defined as 50 buses or less.
 **Medium defined as greater than 50 but less than 201 buses.
 ***Large defined as greater than 200 buses.

The time originally allotted to complete the interview was an hour and a half although several interviews were extended to several hours. Items which were included in the Interview Schedule as well as a coding scheme for quantifying some of the responses are listed in Appendix III.

Archival Records

The other major source of information was obtained by examining each organization's archival records and by working closely with one or several management personnel who were familiar with various structural components of their organization. In most cases, the assistant general manager, manager of personnel, or other upper-level managers would assist in the completion of this survey. Some of the structural elements which were analyzed include types and numbers of vehicles, provision of special services, subdivision of departments according to types and number of personnel, and existence of written rules and regulations. Items which were included in the archival records form are presented in Appendix IV.

Characteristics of Sample Transit Managers

Some of the characteristics of the sample of transit managers are worth noting. The average age of the transit managers was 41.1 years with a standard deviation of 11.1. One interesting point is that several properties were characterized by a management staff that was for the most part, either one standard deviation above or below the mean. Several newer properties were characterized by extremely young staffs. Apparently, however, the gap in management experience between properties characterized by either extremely younger or older staffs seemed to have

little bearing on the characteristic "management style" of the respective property.

An important trend regarding formal management education of transit managers with respect to age is significant. Virtually all of the managers (especially upper level) who had earned a college degree or who had pursued graduate-level work in management were in the 25-35 year old category. This statistic reveals a trend in transit management which may have an important impact on how systems are managed in the near future. A growing number of middle and upper-level transit managers are assuming important positions in transit organizations without having extensive (or any) experience in transit. This trend seems counter to the "traditional" transit manager who "worked his way up through the ranks" over a long period of time. The trend also seems to indicate that in the near future a majority of transit managers, particularly at the middle and upper levels, will have had some formal management education.

Unfortunately, many of the courses offered at the undergraduate and graduate levels do not address themselves specifically to transit management. However, this problem seems to be diminishing, and there are several major educational institutions and universities which now offer professional transit-related extension and certificate courses. It is worth noting that in our sample, 36% of the transit managers had no formal management education of any kind.

An important trend in management education has been developing over the past decade. Transit organizations are taking advantage of various educational programs and university extension opportunities to the extent that over half (55%) of the managers in the sample reported that their

present organization has provided them with some transit management training. This type of training ranged from the showing of films on-site to attendance at transit seminars held throughout the country. This trend appears to indicate the importance with which many managers regard formal training both for specific skills in transit as well as management skills in general.

The overall sample of transit managers is comprised of a predominantly white (85.4%) male (87.4%) group. Although women and minority groups are becoming common in transit management, they remain under-represented. Women and minority managers are more frequently found in the medium sized properties which have expanded operations during the last eight years.

CHAPTER 3
INDICATORS OF TRANSIT PERFORMANCE

The concept of organizational effectiveness is still in the early stages of development. In many instances, for example, effectiveness is used as a synonym for efficiency in some organizations. But effectiveness means much more than efficiency; a brief discussion here will clarify the essential distinction between the two concepts. Discussing efficiency and effectiveness, researchers have noted that effectiveness is the right foundation for success--efficiency is a minimum condition for survival after success has been achieved. Efficiency is concerned with doing things right. Effectiveness is doing the right thing.¹

Etzioni makes a similar distinction when he states that organizations are constructed to be the most effective and efficient social units. "The actual effectiveness of a specific organization is determined by the degree to which it realizes its goals. The efficiency of an organization is measured by the amount of resources used to produce a unit of output."²

¹Gordon J. Fielding, Roy E. Glauthier, and Charles A. Lave. Development of Performance Indicators for Transit. Prepared for U.S. Department of Transportation, Urban Mass Transit Administration (Contract No. CA-11-0014-4), Institute of Transportation Studies and School of Social Sciences, University of California, Irvine, December, 1977. Fielding, Glauthier, Lave. Also, see Peter F. Drucker, Management: Tasks-Responsibilities-Practices. New York: Harper and Row, 1973, p. 45.

²Amitai Etzioni, Modern Organizations. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1964, p. 8.

H. Randolph Bobbit also stated that effectiveness and efficiency are interrelated and if an organization is to maintain its existence, it must be both effective and efficient.³

There are few generally accepted definitions of effectiveness or efficiency at least in the organization sense. Haberstroh, for example, notes that "effectiveness refers to the attainment of the objectives of the organization."⁴ Hicks and Gullett state that an effective organization is one that satisfies those with power over the organization.⁵ Such definitions are highly simplistic in that they focus on only one dimension of organizational effectiveness. There are, however, several approaches to the study of organizational effectiveness which emphasizes the multidimensionality of the concept. One noteworthy example is the definition advanced by Georgopoulos and Tannenbaum, which defines organizational effectiveness as "the extent to which the organization, as a social system, fulfills its objectives without incapacitating its means and resources and without placing undue strain upon its members."⁶ This definition subsumes as general criteria of organizational effectiveness (1) organizational productivity, (2) sufficient flexibility to adjust

³H. Randolph Bobbitt, Jr., et al. Organizational Behavior: Understanding and Prediction. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1974.

⁴Chadwick H. Haberstroh, "Organization Design and System Analysis," from March, James G. (Ed.), Handbook of Organizations, Chicago: Rand McNally, 1965.

⁵Herbert G. Hicks and C. Ray Gullett, The Management of Organizations (3rd edition), New York: McGraw-Hill, 1976.

⁶Basil S. Georgopoulos and Arnold S. Tannenbaum, "A Study of Organizational Effectiveness," American Sociological Review, October, 1957.

or adapt to internal organizational change or external environmental changes and (3) a minimum of strain or conflict among organizational members or groups.

These criteria include both means and ends, and apply to most types of formal organizations.

The Measurement of Organizational Effectiveness

There is a definite need for valid measures of organizational effectiveness. Valid measures of effectiveness will permit a given organization to examine its internal operations in critical areas to ensure that its performance is maintained at a high level. Measures of effectiveness will also facilitate meaningful comparisons of performance among formal organizations. Such interorganizational analysis will, in turn, enlarge the total body of knowledge on the management of formal organizations and reveal new and better ways to move organizations toward their objectives.

Given the need for valid measures of organizational performance, it would seem that such measures should be developed without too much difficulty. But such is not the case. It is interesting to note that the concept of organizational effectiveness came into being less than 30 years ago. Prior to this time, the effectiveness of business organizations was typically measured in terms of profitability; similar measures of public and service organizations were virtually nonexistent. Discussions of organizational effectiveness today usually make no distinctions among types of formal organizations, which limits the applicability of profitability and productivity as general measures of performance. Also, the growing concern with the organization's environment and the needs of its members and groups have added new dimensions to the concept of

organizational effectiveness. The growing multidimensionality of the concept and the proliferation of variables alleged to influence the performance of formal organizations has complicated that which was formerly manifest in measureable terms or, more likely, not considered at all. Thus, the increasing complexity of formal organizations and the rising expectations as to what the organization should do intensify the difficulties inherent in defining and measuring organizational performance.

Difficulties in Measuring Organizational Effectiveness

Etzioni notes some of the problems associated with measuring organizational effectiveness. He states that when an organization has a goal which is limited and specific, it is comparatively easy to measure performance. If, however, the organizational goal is a continuous one, measurement is more difficult. Finally, when we come to organizations whose output is not material, statements about performance are extremely difficult to validate.⁷ While Etzioni accurately identifies some of the difficulties, he adds a complication by simply stating that the effectiveness of a given formal organization is determined by the degree to which it realizes its goals. Some researchers state that the criterion of goal attainment is too universal and global to serve as a meaningful measure of organizational effectiveness.⁸

⁷Etzioni, op. cit., p. 9.

⁸For an extended discussion of some of the most prevalent difficulties in measuring organizational effectiveness, see: Richard M. Steers, Organizational Effectiveness: A Behavioral View, Santa Monica: Goodyear Publishing Company, Inc., 1977; Paul S. Goodman, Johannes M. Pennings, New Perspectives on Organizational Effectiveness, San Francisco: Jossey-Bass, Inc., 1977.

Most definitions, analyses, and models of effectiveness are based, at least in part, on end results. Price alludes to this difficulty when he notes: "The definition of 'goals' is crucial in the definition of effectiveness. This . . . approach for effectiveness, sometimes referred to as the 'goal approach', is the customary one."⁹

A crucial difficulty in measuring organizational effectiveness is that productivity is invariably one of the criteria.¹⁰ Productivity may be a misleading, or inapplicable measure of effectiveness in certain types of service organizations, such as transit, and a less than perfect measure of effectiveness in many production-oriented organizations.

Goals for Transit

Fielding, et. al., state that ". . . There are a number of social, economic, and political goals which are in some manner affected by the absence or presence of transit service. The evaluation of transit must address these different goals and clearly must justify the inclusion or exclusion of particular goals or classes of goals."¹¹ They then set out to develop performance indicators for the evaluation of transit properties in different locations, of differing size, and with different operational procedures.

⁹James L. Price, Handbook of Organizational Measurement, Levington, Mass.: D.C. Heath, 1972, p. 101.

¹⁰See, for example, Paul E. Mott, The Characteristic of Effective Organizations, New York: Harper & Row, 1972.

¹¹Fielding, Glauthier and Lave, op. cit.

In terms of goals, the federal government has stated clear goals for transit:

It is declared to be in the national interest to encourage and promote the development of transportation systems, embracing various modes of transport in a manner that will serve the States and local communities efficiently and effectively.¹²

The goals of efficiency and effectiveness are further supported by an examination of the program audit guidelines established by the General Accounting Office.¹³ These guidelines specify three distinct elements of the audit procedure: (1) financial and comprehensive; (2) economy and efficiency; and (3) program results or effectiveness.

Given that transit performance should encompass both the concepts of efficiency and effectiveness, Fielding et. al. proceed to delineate these concepts in a manner specific to transit operations.

As mentioned in Chapter 2, the measures developed in the Fielding, et. al. research will be utilized in the present research as indicators of transit organization performance. The following is a restatement of the concepts of efficiency and effectiveness as used in Fielding, et. al. as well as a brief description of the individual performance indicators which will be used in the present research.

¹²Urban Mass Transportation Act of 1964 (Amended), Section 5(g)(1).

¹³U.S. General Accounting Office. Standards for Audit of Governmental Organizations, Programming, Activities, and Functions, 1972.

Efficiency

Efficiency was discussed in terms of the processes by which transit services are produced, particularly through the relationship of inputs to produced output. Fielding et. al. emphasize the point that because efficiency deals with the process of providing transit service, and specifically with the use of inputs in that process, it utilizes only measures of produced rather than consumed output.¹⁴ Produced output is represented in measures such as vehicle hours and miles rather than passengers and passenger miles.¹⁵

SELECTED EFFICIENCY INDICATORS

Revenue Vehicle Hours Per Employee

This measure is used as an efficiency measure of labor productivity. This measure will generally be affected by the size of the administrative staff of the property, its peak/off-peak ratio, and hours of service. In order to calculate this indicator for the 16 participating properties, a ratio was calculated of the total number of revenue vehicle hours reported for each property over the total number of its employees. This indicator could be tenuous in the case of municipal properties when employees who perform critical functions for the organization (such as

¹⁴For another discussion of productivity measurement in transit, see John R. Meyer and Jose A. Gomez-Ibanez, Improving Urban Mass Transit Productivity, prepared for U.S. Department of Transportation, Urban Mass Transit Administration (Grant No. MA-11-0026). Harvard University, Cambridge, Mass., February, 1977.

¹⁵See Anthony R. Tomazinis, Productivity, Efficiency, and the Quality in Urban Transportation Systems. Lexington, Mass: D.C. Heath, 1975.

personnel and maintenance) are not accounted for in the overall tally of employees.

Revenue Vehicle Hours Per Vehicle

This indicator is significantly affected by the service hours of the property, the peak/off-peak ratio, and the daily service vehicles/total fleet ratio. Caution must be observed when calculating this ratio since some properties may include reserve-fleet or unused vehicles in their total-vehicle figures.

Operating Expense Per Revenue Vehicle Hour

This is an efficiency measure of total inputs per unit of service produced. As opposed to the previous two efficiency measures discussed, a low value is generally favorable on this indicator. In general, this indicator is affected by the property's peak/off-peak ratio, hours of daily service, and the effect of unionization. As in the case of other efficiency indicators, municipal properties' scores on this indicator may be somewhat in error if there is not full accounting for costs of services or facilities which are provided by other municipal individuals or departments.

Effectiveness

According to Fielding, et al., "Effectiveness is the comparison of produced output (provided service) to intended output or objectives. Measures of effectiveness are concerned with the extent to which the service provided--in terms of quality, location, and character--corresponds to the goals and objectives established for it by government

and to the needs of the citizens."¹⁶ Several types of measures have been developed to reflect levels of effectiveness for transit operations. Some of the types of factors which comprise these measures include service accessibility, percent population served, passenger utilization of services, and operating expense per unit of consumed output.

SELECTED EFFECTIVENESS INDICATORS

Revenue Passengers Per Service Area Population

This particular effectiveness measure is used to approximate the "penetration" of transit into its potential market. In essence, this measure produces a figure for trips per capita within the service area. However, values are significantly affected by the definition of a property's service area. The determination of the service area boundaries can best be termed a political process and the use of this measure should be tempered with a recognition of this process.

Total Passengers Per Vehicle

This indicator measures system ridership and capacity utilization and is indexed to an average transit vehicle. It is calculated simply by dividing a system's total annual ridership by the number of vehicles in the system. The actual figure is affected by average trip length, rate of transfers in the system, peak/off-peak and daily service/total fleet

¹⁶Fielding, et. al., op. cit., p. 6.

ratio. There is one problem when utilizing this indicator in that the use of total passengers as a measure of capacity utilization fails to recognize differences in trip lengths. Thus, a property with large numbers of transfer passengers will appear more effective than other properties with few transfers, other conditions being equal.

Revenue Passengers Per Vehicle Hour

This indicator measures system ridership per unit of produced service. It is affected by peak/off-peak ratios, hours of service, vehicle capacity, and average trip length. The use of "revenue passengers" rather than "total passengers" is intended to identify the individual passengers in the system rather than the unlinked trips made by those passengers. The overall performance of a system, in this case, is based on passengers served, not on the segmented trips those passengers are required to make by virtue of a system's route structure and their particular destinations.

Operating Expense Per Total Passenger

This indicator measures total inputs per unlinked trip within a system. In utilizing total passenger figures, this measure recognizes that transporting a passenger from Point A to Point B in a particular vehicle incurs the same cost regardless if that passenger transfers to another vehicle and continues his/her trip or stops at that point. This indicator utilizes input statistics (total operating expense) and consumed service statistics (passengers) to obtain what might be labeled a combined measure of efficiency and effectiveness.

Operating Expense Per Revenue Passenger

This is an effectiveness indicator of total inputs per individual passenger or linked trip within a system. Using "revenue passengers" is important because this figure ignores the number of segmented trips which may comprise a single journey from A to B. The result is a particularly meaningful statistic since passengers generally pay a single fare regardless of the number of transfers in the trip. The indicator value produced is easily adjusted to the average fare paid on the system.

Percent Population Served

This is an indicator of the accessibility of provided transit service to an area's population. This indicator may be affected either favorably or unfavorably by the definition of the service area. Such a decision, as noted previously, is largely political in nature.

Summary

The performance indicators which will be used in this study consist of three measures of efficiency and six measures of effectiveness. The selection of these nine measures resulted from an evaluation of theoretical considerations, data availability, and independence from environmental influences. As Fielding, et. al. have stated in their report, this set is not an optimal one.¹⁷ As more reliable data becomes available, other indicators should be considered. These measures do, however, allow us to make some comparisons between properties utilizing data which is,

¹⁷Fielding, et al., op. cit., p. 21.

in most cases, objective in nature as well as understandable and interpretable across properties.

Table 3-1 summarizes the indicators which will be used in this study as measures of transit-organization performance.

FIGURE 3-1

SELECTED PERFORMANCE INDICATORS

Efficiency

As Measures Of:

Revenue Vehicle Hours Per Employee	Labor Productivity
Revenue Vehicle Hours Per Vehicle	Vehicle Utilization
Operating Expense Per Revenue Vehicle Hour	Expense Per Produced Unit of Output

Effectiveness

Revenue Passengers Per Service Area Population	} Utilization of Service
Total Passengers Per Vehicle	
Revenue Passengers Per Revenue Vehicle Hour	
Operating Expense Per Total Passenger	} Expense Per Consumed Unit of Output
Operating Expense Per Revenue Passenger	
Per Cent Population Served	Quality of Service Accessibility

PART II

ANALYSIS OF STRUCTURE - ATTITUDE - PERFORMANCE RELATIONSHIPS

CHAPTER 4

ANALYSIS OF STRUCTURAL RELATIONSHIPS

This chapter presents the results of the statistical analyses which were performed on data regarding structural characteristics of the 16 transit properties in our sample. One of the goals of this process is to compare the results of our analyses with the results of studies conducted in other types of organizations as reported in the literature. Certain "basic" relationships are examined, especially with respect to size. Certain structural attributes which were measured by the perceptions of the transit managers (e.g., formalization, centralization) are also compared with the size dimension.

These analyses are important because they serve as the basis for comparison among transit properties. Subsequent analyses regarding structure and performance/attitude dimensions would be meaningless if we had neglected the establishment of structural patterns among transit organizations of various size and shape.

A Statistical Note

The relationships between the structural, attitudinal, and performance variables in the data analysis were determined through the computation of correlation coefficients. These statistics are basically a measure of association indicating the strength of the linear relationships between two variables. Our purpose in this research was to examine and document patterns of relationships between key structural and performance variables and not to test any specific hypotheses regarding the

direction of the relationships. Thus our analyses consisted of the use of two bivariate correlation statistics, Kendall's tau and Pearson's r. The correlations of structural variables with respect to organization size (Table 4-1) were calculated utilizing Kendall's tau statistic. The use of this nonparametric measure requires nothing more than an ordinal level of measurement and a large number of categories on each of the variables. Kendall's tau is also the more appropriate correlational statistic to use when the data contain a large number of tied ranks--such as in the case of categorizing many properties into three groups according to size. The remainder of the correlations (Table 4-2) in this chapter utilize the Pearson r statistic, which measures the strength of relationship between two interval-level variables. In this case, the strength of the relationship indicates both the goodness of fit of a linear regression line to the data and, when r is squared, the proportion of variance in one variable explained by the other.

Attention should also be drawn to the column of numbers in each table under the column heading N. In some of the analyses in which structural relationships were examined with respect to formal structural properties (e.g., size and number of subdivisions, number of departments, number of specialities, and vertical span), N represents the number of organizations in which this information was available and which were included in the analyses. In the case of the analysis of structural characteristics in which individual manager's perceptions of structure were utilized (e.g., standardization, formalization, centralization), each manager was treated as a separate case such that a number like N = 238 indicates the number of managers who responded to the particular item.

ORGANIZATIONAL STRUCTURE

Large-scale complex organizations and bureaucracy are often regarded as synonymous. One major issue which has been examined in the organizational psychology and management literature is the importance of size as a predictor, if not a determinant, of organizational structure. Size of organization has often been cited as the attribute having the greatest single influence on the extent to which organizations develop bureaucratic forms of structure. Thus Weber commented on the role of sheer quantity as a leverage for the bureaucratization of a social structure.¹ Pugh and his colleagues were prompted by their research to suggest that size causes bureaucratic structuring through its effect on intervening variables such as the frequency of decisions and social control.² During the past decade, size and structure relationships have been examined in hundreds of research articles, papers, and books. The two previously mentioned studies represent some of the most basic conclusions that have emanated from this body of literature. In general, statements of the form of association between size and organization structure abound to the extent that certain relationships have become assumptions for most analyses of large organizations. For example, larger organizations are more specialized, have more rules, more documentation, more extended

¹H. H. Gerth, and C. W. Mills. (eds.) Max Weber: Essays in Sociology. New York: Galaxy Books, 1958.

²D. S. Pugh, D. J. Hickson, C. R. Hinings, and C. Turner. "Dimensions of Organization Structure." Administrative Science Quarterly, 1968, 13, 65-105.

hierarchies, and a greater decentralization of decision-making further down such hierarchies.³

To many researchers these statements represent a point of departure when considering structural analyses in various types of organizations. However, many of these findings merely state the direction of relationships between size and structure. The literature review which was completed in conjunction with this research demonstrates that in many cases ambiguous relationships exist among certain structural variables.⁴ Also, when analyzing certain structural relationships, more precision is called for by identifying patterns of structural variables in relation to changes in organizational size.

The structural analysis of transit organizations in this research is an interesting process for several reasons. First of all, we are examining structural relationships in organizations where this type of analysis is infrequent, or nonexistent. Second, we are examining organizations of varying size in different geographical locations. This fact enables us to extend our analyses to include organizational performance data as well as to examine various "approaches" to organizational structure in various organizations within one industry. Third, by interacting directly with managers of the transit organizations, we were able to gain a more

³John Child. "Predicting and Understanding Organizational Structure." Administrative Science Quarterly, 1973, 18, 168-185.

⁴D. R. Dalton, G. J. Fielding, L. W. Porter, M. J. Spendolini, and W. D. Todor. The Effect of Organization Size on Transit Performance and Employee Satisfaction: A Literature Review. Initial project report prepared for U.S. Department of Transportation, Urban Mass Transit Administration (Contract No. CA-11-0016-2), Institute of Transportation Studies, School of Social Sciences, and Graduate School of Administration, University of California, Irvine, September, 1978.

complete and intimate understanding of the rationale for many of the structures which we observed. Thus our analyses gave us insights into existing structures in the transit industry and the opportunity to link the structural characteristics to performance and attitudes.

The following sections of this chapter are organized according to the particular structural dimensions which have been examined. Each dimension will be reviewed relative to its relationship with organizational size as well as other structural dimensions. The following structural variables were included in this analysis: organization size, number of divisions, number of specialities, vertical span, span of control, number of departments, size of administrative component, formalization, standardization, and centralization.

ORGANIZATION SIZE DEFINED

Organization size was defined as the number of buses in the transit organization. Total number of personnel in the property was also considered but was not adopted as a size measure since several of the municipal properties in the sample share personnel with other departments of the local government. In some cases, size as measured by number of total personnel and by numbers of managerial personnel is mentioned in addition to the total number of buses in order to demonstrate consistency of findings. In our sample of transit organizations, total number of transit units--buses, small buses, vans (service vehicles were excluded), ranged

from 20 to 900, while total employees working for the organizations ranged from 50 to 2,000. There was a noticeable pattern of variation in organization size within our sample and thus (as mentioned in our tables) we defined small organizations as those properties consisting of 50 buses or less, medium sized properties as consisting of more than 50 buses and less than 201 buses; and large defined as greater than 200 buses.

Number of Divisions

Number of divisions has been discussed under the heading of differentiation in the organizational literature.⁵ This structural dimension refers to the number of distinct physical facilities of an organization. This spatial dispersion becomes a separate element in the concept of organizational complexity when it is realized that an organization can perform the same functions with the same division of labor and hierarchical arrangements in multiple locations. Transit organizations tend to develop subdivisions as a function of size and geographical situation. In our analysis, we found a strong positive relationship between organization size (as measured both by number of buses and total number of employees) and number of subdivisions (Table I). There is a strong tendency for transit organizations to add subdivisions as they get larger. One reason for this process is that large organizations generally serve larger geographical areas. The dispersion of physical facilities reduces "dead-head" time for the vehicles serving particular geographical regions.

⁵See P. M. Blau, and R. C. Schoenherr. The Structure of Organizations. New York: Basic Books, 1971.

Also, larger transit organizations are often located near the Central Business Districts which restricts the amount of land available for vehicle parking and maintenance facilities.

Previous research has suggested that although size has a positive relationship with number of subdivisions, this relationship is not linear: that structural differentiation increases with size but at a decreasing rate. Our sample was not large enough to test this proposition, but recent research has indicated that the non-linear hypothesis may be valid.⁶

Number of Specialities

Increased size of organization is expected to lead to increased specialization and a higher level of specialist qualifications. Some researchers have argued that different values of size generate certain logical possibilities for specialization.⁷ It seems clear that the relationship between size and role specialization would be tautological if by specialization one simply understood different people in separate, though not necessarily substantively different jobs. This is not the case in this research since specialization was limited to defined sets of activities as reflected by distinct job descriptions.

One of the strongest relationships in the analysis of the structural components of transit organizations was that of size and number of

⁶Ibid., p. 172.

⁷B. H. Mayhew, R. L. Levinger, J. M. McPherson, and T. F. James. "System Size and Structural Differentiation in Formal Organizations: A Baseline Generator for Two Major Theoretical Propositions." American Sociological Review, 1972, 37, 629-33.

specialities (Table I). Why does size have an impact on the number of different occupational specialities? As size increases, different specialities are added in the administrative component. They are added in administration because the greater number of interactions generated by increased size complicates the task of administration and because certain "economies of scale" are suggested which make possible the hiring of additional specialities. In transit, new occupational specialities in operations or maintenance would be added only if technology becomes more complex, and increased size does not produce this effect, the major effect of increased size is on task and not on person specialization.

In the transit industry, as size increases it becomes advantageous to add certain non-operationally oriented specialized services such as legal, public relations and grant acquisitions. In most cases it is the complexity of the task rather than the number of personnel that determines whether or not it is economical to do so. Although in general one would assume that increased size represents a more or less continuous growth in volume of work in ancillary areas, justifying a steady increase in staff, it is likely that in the transit industry, the staffs can grow at a step function. Since increasing total organization size does not imply any significant change in technology or even market, there is little more specialization by branches of knowledge. Thus, increasing size allows for certain administrative specialists because it makes the technology of administration more complex, but it does not appear to be the major determinant of the variety of line work or of ancillary occupational specialities.

Vertical Span and Number of Departments

It was previously stated that researchers have generally agreed that there is a positive relationship between size and structural differentiation, albeit a non-linear one. Indeed, in the present research a strong positive relationship was found between organization size and both vertical span and number of departments (Table 1). As the varieties of specialities increases, there is no inherent reason that they should be distributed either in multiple levels or multiple departments. Instead, it is some combination of the two.

There are several reviews of the theoretical arguments concerning the effect of size on number of supervisory levels and number of departments.⁸ The arguments rest on long-term change processes and do not state much about the short-term variety. Effective examination of transit organizations with respect to vertical span and departments requires analysis over the long run. In the transit industry when one examines the effects of changes in size on changes in the number of levels, the relationship isn't clear because fairly large increases in size must occur before a new level is added. If the increase in size is small, existing spans will be able to absorb it.

Part of the difficulty in specifying the relationship of any variable to the number of departments or number of levels in transit organizations arises because of ambiguities in the measure of departments. Reliance upon organizational titles or charts is misleading since organizations do not use the title of department in exactly the same way.

⁸For example, see J. R. Kimberly. "Organizational Size and the Structuralist Perspective." Administrative Science Quarterly, 1976, 21, 571-597.

In any case, it is safe to state at this point that both the number of departments and vertical span increase as organization size increases in our sample of transit organizations.

The Size of the Administrative Component

This variable refers to the number of individuals in transit organizations not directly involved in operations and maintenance functions (i.e., operators and mechanics). This would leave managerial, staff specialist, and office personnel as the administrative component.

Recent research suggests that the relative size of the administrative component decreases as organization size increases.⁹ The tendency toward curvilinearity is slight, and the increase among the large organizations does not reach the level found in the smaller organizations. This tendency is also consistent with the literature which proposes that organizations achieve an economy of scale in that the proportion of persons engaged in administration decreases as the organization increases in size.¹⁰

The data from the transit organizations in our sample strongly supports the findings in the literature. Size of administrative component was operationalized as the total number of personnel in management, staff, and clerical positions divided by the total number of personnel in operations and maintenance departments. A strong negative correlation

⁹See E. J. Haas, R. H. Hall, and N. Johnson. "The Size of the Supportive Component in Organizations: A Multi-Organizational Analysis." Social Forces, 1963, 42, 9-17.

¹⁰R. Bendix. Work and Authority in Industry. New York: John Wiley & Sons, Inc., 1956.

emerged when this measure was correlated with organization size. In our sample of transit managers, proportionately fewer administrative personnel were employed as organizations grew larger.

There are a number of reasons for such economies in transit organizations. It is clear that certain tasks are required for organizational existence per se. Personnel administration, accounting, janitorial and secretarial services, must be performed regardless of organization size. In extremely small transit properties, many of these functions are performed by the same person, but in organizations of moderate size, separate personnel are needed for each function. In smaller transit organizations, the personnel engaged in these various activities may be "underused" in the sense that full use is not made of their efforts in their particular areas of specialization. As organizations become larger, these same persons can perhaps continue to handle the supportive work load without the addition of other personnel. In other words, more complete use is made of such persons, thus reducing the proportion of the total personnel needed to maintain supportive activities. Larger transit organizations also seem to be the most likely, from the financial point of view, to install computers and other labor-saving devices and thus reduce the size of the administrative component.

Formalization/Standardization

Formalization in transit organizations refers to the extent to which procedures, rules, instructions, and communications are formalized--that is, reduced to writing. For example, are contracts of employment with the organization in writing? Is there a formal organization chart? Are there written job descriptions? Are there work assessment records?

^ Standardization is the extent to which each of several organizational activities is subject to standard procedures or rules. For example, is inventory taken weekly, monthly? How are personnel evaluations carried out, if at all? Are progress reports prepared by department heads for their superiors? Though this measure has some obvious weaknesses, it is probably a fair measure of the depth of routinization in an organization.

It is generally agreed that the primary function of standardization and formalization is to allow organizations to carry on many activities efficiently. But the secondary function of these activities is to knit together the diverse activities of the organization, particularly through programs that link activities together. Overall, the structuring of activities gives a great deal of predictability and stability to whatever goes on in organizations. Some of the costs, however, are inflexibility and red tape (further discussion of costs and benefits will be presented in Chapter 6).

Research has demonstrated that the size of the organization was most strongly correlated with structuring factors in organizations.¹¹ The strong positive relationship is not surprising since increasing size usually implies a wider range of organizational activities and tasks. This necessitates a greater division of labor and specialization of functions and a greater use of formally documented standard operating procedures.

The results of the analysis of transit manager's perceptions of standardization as well as the existence of written rules, regulations,

¹¹J. Woodward. Industrial Organizations: Behavior and Control. London: Oxford University Press, 1970.

contracts, policies, and job descriptions confirms the finding of the relationship between size and standardization-formalization. Although the correlations were significant, they were not exceedingly strong (Table 4-1). This fact is probably caused by several factors. Most transit organizations recognize trade unions and are under considerable pressure to formalize wage contracts and work procedures, and this is likely to lead to a more elaborately structured organization. Work flow integration, is also likely to impel transit organizations toward more elaborate structuring of activities. The planning and execution of highly interdependent and integrated work schedules would be virtually impossible without standardization, documented work schedules, specialized plans, schedules of operations, and so on. Thus, variance among organizations of various size regarding the degree of formalization-standardization is reduced. In items of managerial activities, few transit managers in our sample stated that they relied on rules and regulations when performing their daily activities. Although most managers would agree that standard operating procedures were important and were observed, few would suggest that they rely on formalized job descriptions or organization charts to determine work and workflow activities.

Centralization-Decentralization

In the management literature decentralization connotes several different, though related things. Decentralization can mean dispersal of capacities or facilities, such as when a transit organization operates out of several divisional locations. More commonly, however, decentralization means the delegation of authority for making decisions to another

group or to individuals who are usually lower in rank. Thus, in transit organizations, the board of directors may delegate authority to the general manager to make all operating decisions as well as capital budgeting decisions up to some magnitude. The general manager may, in turn, delegate to management committees or to individual department managers the job of making a number of operating decisions related to marketing, personnel, maintenance, and the like. The relevant question is: what is the management level at which specific types of decisions are actually taken, even if they are "rubber-stamped" at higher levels?

Several studies indicate that large organizations are more decentralized than small organizations.¹² Some large organizations carry on many diverse activities, those at the top must of necessity distinguish between urgent, strategically important tasks and the more routine, tactical tasks. The latter tend to be delegated, resulting in a substantial decentralization of decision-making authority.

The analysis of the data from our sample supports the negative relationship between size and centralization (Table 4-1). As transit organizations get larger there is a tendency toward decentralization of decision making. The explanation of this phenomenon in light of recent research is somewhat paradoxical. Researchers have suggested that the large size of an organization produces conflicting pressures on top management, as it heightens the importance of managerial decisions, which discourages delegating them, and simultaneously expands the volume of managerial responsibilities which exerts pressure to delegate some of them. The net result of increasing size is increased delegation or

¹²Pugh, et al., op. cit.

TABLE 4-1
ANALYSES OF VARIOUS STRUCTURAL DIMENSIONS WITH ORGANIZATION SIZE

	Kendall's <u>tau</u>	Significance <u>Level</u>	<u>N</u>
Number of Subdivisions	.4202	.019	16
Number of Specialities	.7778	.001	10
Vertical Span	.6799	.001	14
Number of Departments	.6865	.001	16
<u>Administrative Component</u> <u>Operating Component</u>	-.5083	.006	14
Standardization	.1171	.035	239
Formalization	.1105	.044	239
Centralization	-.1353	.018	239

decentralization.¹³ The risk of delegation is lessened if personnel have expert qualifications. A centralized policy in regard to employee qualifications thus appears to contribute to delegated power. One problem with this line of reasoning should be noted: it is impossible to determine if increase size leads to pressures to delegate and thus to utilize experts, or if the hiring of experts leads to pressures to delegate, with size not really being a factor. The questions cannot be answered with the kinds of data now available, but probably a combination of both processes occurs.

An interesting relationship which has attracted attention in the management literature is the relationship between centralization and formalization.¹⁴ Researchers have suggested that increasing size is related to increasing use of rules. This leads to decentralization of decision-making but not to loss of control for the organization. In smaller organizations, specialists report directly to the top of the organization, while in larger ones, problems are handled at a decentralized level, but under the guidance of organizationally-based rules. It is only common sense that it is impossible to control organizations from the top: because much more is happening than an individual or a set of individuals can comprehend--delegation is inevitable. Therefore, decentralization is likely to be accompanied by an increase in standard procedures and documentation designed to maintain control and consistency

¹³Blau and Schoenherr, op. cit., p. 130.

¹⁴See P. M. Blau. The Organization of Academic Work. New York: John Wiley & Sons, 1973. R. Mansfield. "Bureaucracy and Centralization: An Examination of Organizational Structure." Administrative Science Quarterly, 1972, 17, 163-177.

of performance. In addition, the employment of specialists is itself likely to generate more standardization of procedures and documentation. Specialists have generally been trained to institute sound management systems which usually entail standardized procedures and forms.

Analysis of the data for our sample of transit organizations indicates that as organizations become more centralized, there is a significant decrease both in formalization and standardization. Although transit managers were at a loss to predict such an association, certain explanations may be proposed. Decentralized arrangements in some transit organizations rely on the skills and expertise of its members while the centralized arrangement relies on rules. The former appears likely to emphasize self-control while the latter appears to emphasize close supervision as a mechanism for control. One factor which the research staff proposed to explain certain patterns of delegation of authority was the personality and leadership traits of the general manager of the transit organization. It was quite clear from our interviews with the general managers and through our discussions with other manager that certain upper-level managers are more naturally predisposed to decentralized structures, while others are of the opposite persuasion. For whatever reasons these inclinations exist, the resultant effects on the structures of their respective organizations are often quite significant. Changes in top-level leadership in organizations are often accompanied by changes in responsibilities of the managerial staff. It appears that the decision to decentralize is often made by one individual in the organization and that this preference is not necessarily guided by any credence in or recognition of the results of more formally documented organizational analysis.

An interesting relationship which emerged from our analysis was that between centralization and vertical span, or number of managerial levels. The research staff observed several cases in which extremely centralized structures resulted in relatively "flat" organizations. That is, the more centralized the organization, the fewer the number of management levels in the particular organization. Formal correlational analysis revealed a significant negative correlation between centralization and vertical span (Table 4-2). This finding reflects the relative absence of delegation in centralized transit organizations. Upper level managers in centralized organizations maintain much of the control (and power) in the organization while lower and middle-level managers are relegated to the role of maintaining the organization. As transit organizations become more decentralized, more responsibility is delegated down the managerial hierarchy and more decision-making levels are added to the organizational hierarchy. However, caution must be exercised when inferring the direction of the relationship between centralization and vertical span. Perhaps as organizations grow and more managers and specialities are added to the ranks of the organization (and more levels are added to the organizational hierarchy), centralized control vertically becomes impossible, as was previously stated, and managers are "forced" to delegate increasing amounts of responsibility which ultimately results in organization-wide decentralization effects.

In support of this latter proposition, it should be noted that significant negative correlations emerged when managerial span of control was correlated with both number of organizational subunits and number of specialities (both of which correlate significantly with size). So as

TABLE 4-2
ANALYSIS OF SELECTED STRUCTURAL RELATIONSHIPS

	Pearson <u>r</u>	Significance <u>Level</u>	<u>N</u>
Centralization with Formalization	-.2021	.001	238
Centralization with Standardization	-.1326	.021	238
Centralization with Vertical Span	-.1406	.024	198
Span of Control with Number of Subunits	-.1493	.011	236
Span of Control with Number of Specialties	-.2472	.001	150

organizations grow and additional specialities and subunits are added, managers' span of control, on the whole, decreases (Table 4-2). This means that managers supervise fewer subordinates and are less able to maintain a "centralized" mode of control within the organization.

SUMMARY

This chapter has examined the durable and formally sanctioned relationships between structural variables as well as the relationships of individuals with one another, with roles and with procedures. It is important to realize that words like "formalization" and "centralization" are abstractions. What lies behind them is a certain molding of human behavior and the creation of certain role expectations.

The various elements of organizational structure perform a number of functions: the reduction of external and internal uncertainty confronting decision-makers, the efficient undertaking of a multitude of activities, and the proper coordination of these activities so that the organization can achieve its objectives. While all elements of structure fulfill these functions, they vary considerably in the extent to which one or the other function is primary.

The observation that bureaucratization is more evident and extensive among larger organizations has been discussed and substantiated in the literature and in this research. However, it is not likely to be just large size in itself which, in causal terms, is of direct consequence for the degree of bureaucratic control utilized. Thompson has argued that

larger organizations are not necessarily those with the most elaborate structure.¹⁵

This proposition is acceptable insofar as one might argue that it is the degree of complexity as well as other factors which tend to force management toward bureaucracy or some other system of coordination and control. For example, many smaller organizations reach a relatively high level of structural complexity due to a need to conform to the requirements of various local, state, and federal funding and regulatory bodies.

Attempts to determine empirically the causal status of size are becoming more common. The current view is that the effects of size are antecedent, that is, exogenous in their relation to structure. For example, the transit sample suggests that as size increases and roles become more specialized, managerial control tends to become more indirect and personal. The possibility for decentralization of decisions to qualified employees and the necessity to do so will both be more in evidence. Decentralization is likely to be accompanied by an increase in standard procedures and documentation designed to maintain control and consistency of performance. In addition, the employment of qualified specialists such as those in personnel, accounts, and public relations, is itself likely to generate more standardization of procedures and documentation.

Figure 4-1 presents a summary of the organizational structure relationships suggested by this research. The arrows denote directions of

¹⁵J. D. Thompson. Organizations in Action. New York: McGraw-Hill, 1967.

influence and the + and - signs indicate the resulting positive or negative relationships which were discovered in the analysis.

Precautionary Note

Current research also reflects other views of the size-structure relation in its causal sequence. Although size is seen as an exogenous variable conceptualized as another structural characteristic, a component of organizational context, or environment by some, it is also seen as a consequence of organizational goals, strategy, or a combination of environmental, technological, and structural factors by others.¹⁶

When considering the bottom-line question of the causal effects of size, other considerations regarding how the variables and associations have been measured have impacted the results of previous research. In general, size and its relation to structure is discussed primarily in associational terms, and the theoretical development of the literature appears to have been largely method bound, at least insofar as causality is concerned. For example, one problem which has plagued attempts to

¹⁶For more detailed discussion of alternative treatments as the size-structure relationship, see H. E. Aldrich. Technology and Organizational Structure: A Reexamination of the Findings of the Aston Group. Administrative Science Quarterly, 1972, 17, 26-43.

J. Child, op. cit., 168-185. D. J. Hickson, C. R. Hinings, C. McMillan, and A. R. Schwitter. "The Culture-Free Context of Organizational Structure, A Trinational Comparison." Sociology, 1974, 8, 1-14.

M. W. Meyer. "Size and Structure of Organizations: A Causal Model." American Sociological Review, 1972, 37, 434-441.

establish the causal effects of size is the general absence of longitudinal data.¹⁷ Of particular importance for the study of size-structure relation is the problem that cross-sectional data do not enable the researcher to take the historical evolution of size into account. There is some evidence and much speculation suggesting that what is important for the size-structure configuration for any one point in time is where it has been in the past.¹⁸ When cross-sectional data are used, the effects of size may be obscured because one cannot differentiate the growing from the declining or stable organization. Although the data on structural components in this research represent cross-sectional analyses, the research team made an effort to assess the history of each transit property (see Appendix III - Interview schedule items) in order to gain an understanding of how past (and future) events have shaped the existing (or future) organizational structure.

¹⁷For a discussion of some of the dangers of drawing causal inferences from cross-sectional data, see E. A. Holdaway, and T. A. Bowers. "Administrative Ratios and Organization Size: A Longitudinal Examination." American Sociological Review, 1971, 36, 278-286.

¹⁸See J. H. Freeman, and M. T. Hannan. "Growth and Decline Processes in Organizations," Sociological Review, 1975, 40, 215-228.

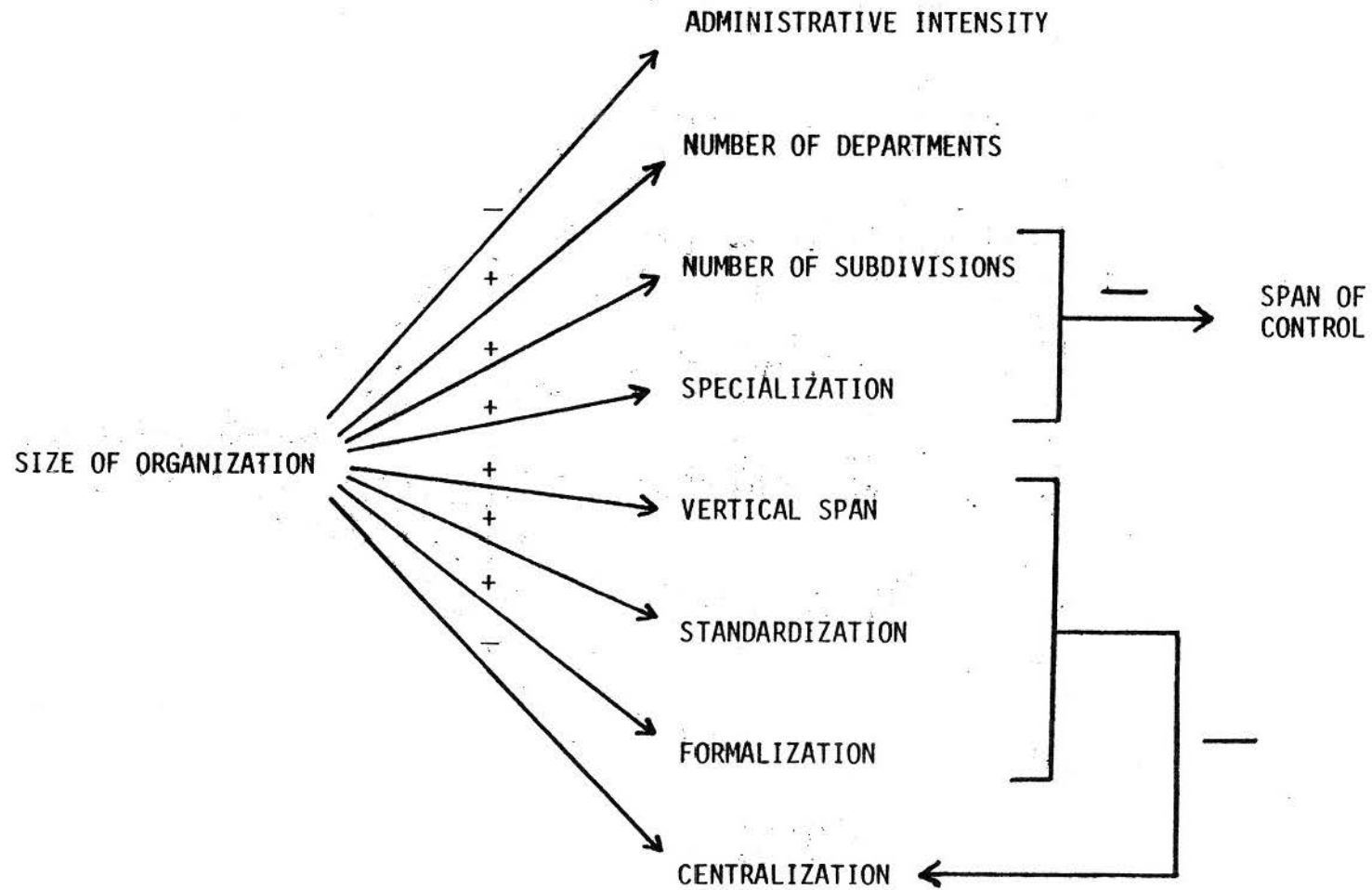


FIGURE 4-1. SUMMARY OF ORGANIZATION STRUCTURE RELATIONSHIPS SUGGESTED BY ANALYSIS OF SAMPLE TRANSIT PROPERTIES

CHAPTER 5

ANALYSIS OF STRUCTURE - PERFORMANCE RELATIONSHIPS

The role of organizational structure in the success of an organization has long been a topic of concern among organizational analysts. As such, a great deal of information is available from which to draw conclusions concerning the relationship between these variables and certain aspects of organizational performance.

The analysis of structure--performance relationships must be approached with caution, particularly in the transit industry, for several reasons. First, general prescriptions regarding structural configurations and performance are rare and may be misleading. Second, standardized measures of performance often do not exist, and if they do, must be interpreted with caution due to questionable methods of collecting and categorizing data. Third, it is crucial to recognize that structure is but one factor that may relate to organizational performance. An examination of statistical correlations reveals that although relationships may be significant, the amount of variance explained by certain structural variables is of such low magnitude, that causal statements regarding structure--performance linkages should be discouraged.

In transit, the fact that standardized measures of performance are a fairly recent phenomenon only adds to the problem of interpreting structure--performance relationships. The main problem lies in how information is collected by the individual transit organizations. Various methods of collecting information such as revenue vehicle hours,

percent population served, and passenger statistics often produce unreliable and sometimes invalid results. Fortunately, in this research we were able to check certain performance statistics for a given fiscal period with information gathered in previous studies. Thus, we could conduct a simple test of reliability and were able to identify problems which some organizations had in their statistical recording procedures.

The measures of organizational performance which were used in the analysis include employee turnover statistics as well as the three efficiency and six effectiveness measures described in Chapter Three (see Figure 3-1). The analyses in this chapter consisted of correlating various structural and demographic variables with the performance measures. In some cases, a clear pattern seems to emerge regarding a particular structural dimension and performance. In most cases, however, structural dimensions or demographic variables show moderate relationships with a few performance indicators. It is worth noting in these types of cases that the relationships which demonstrated significance, did so in a consistent manner (e.g., several effectiveness measures indicating a positive relationship, for example, with a particular organizational variable) and in keeping with the direction of the relationships as suggested in the literature.

In the following section individual structural and demographic variables will be discussed with respect to their relationship with various performance measures. It should be emphasized that general patterns of relationships are important in this analysis, and that caution should be exercised when interpreting individual structure--performance associations.

Organizational Size

A good deal of research has focused on the issue of how the size of an organization may influence various aspects of organizational success. An examination of the literature suggests mixed findings. Five of six studies which have been performed in the last decade reported no association between size and performance. However, based on the results of several studies, size appears to be positively associated with increased organizational efficiency.¹ An analysis of the relationship between size and performance for our sample of 16 transit organizations indicates that organization size is closely related, though insignificantly, to one measure of efficiency--Revenue Vehicle Hours Per Vehicle (Table 5-1). This is perhaps due to the fact that larger bus systems operating in metropolitan areas, usually provide service on an 18 or 20 hour basis, whereas a 12-hour schedule is characteristic of transit systems in smaller cities. Thus larger properties may be more efficient regarding vehicle utilization than smaller organizations.

One measure of effectiveness, percent population served, also correlated positively with size. Large transit organizations usually operate service which extends beyond the central city. Their route coverage enables them to serve a higher percentage of the population. One measure with which size is negatively correlated is turnover of operating employees. Larger organizations in our sample had a lower turnover of operators than smaller properties. One reason which might account for this finding is that operators in larger properties receive

¹R. M. Steers. Organizational Effectiveness: A Behavioral View, Santa Monica: Goodyear Publications, 1977.

higher pay than operators in smaller organizations. Higher rates of pay may contribute to the willingness to stay with the organization.

In general, there are few valid relationships between organization size and performance. Some performance variations are associated with total size, but available research suggests that total size may interact with other structural variables in determining such differences. Also, the effects of total organization size may operate through intervening constructs at the individual and group level. Based on the accumulated evidence, there is no clear trend with respect to the effects of size and performance in the transit industry.

Span Of Control

Very few studies have examined the effects of span of control on performance.² Only two studies actually posited the concept that large spans were superior. Both studies suggested that large spans provide the opportunity for better initiative and better communications as well as increasing the human resources available to the individual manager.³

The analysis of the transit performance data indicates that one efficiency and two effectiveness measures were significantly correlated to managerial span of control (Table 5-1). Vehicle utilization and system ridership measures were both positively correlated with span of

²L. W. Porter, and E. E. Lawler III. "Properties of organization structure in relation to job attitudes and job behavior," Psychological Bulletin, 1965, 64, 23-51.

³See, J. C. Worthy. "Organizational structure and employee morale," American Sociological Review, 1950, 15, 169-179. G. H. Farris, "Organization factors and individual performance," Journal of Applied Psychology, 1969, 53, 87-92.

control, while operating expense per passenger demonstrated a slightly negative relationship. Also, managerial turnover was negatively correlated with span of control. Thus, larger spans of control are associated with lower managerial turnover, lower overall operating expense per passenger, and better vehicle utilization and ridership figures. Although some of the correlation figures are low, the trend in the relationships lends support to the idea that perhaps managers who are responsible for more employees are able to perform their duties more effectively than might be the case in an organization typified by "close-supervision." Certain organizational efficiencies are also realized when larger spans of control are utilized especially at the lower managerial and supervisory levels. Larger spans mean fewer managers at the lower levels which translates into fewer managers overall in the organization. This has a direct impact on administrative costs. Thus, within an acceptable range, the span of control of individual managers, particularly at lower levels of management, may be increased beyond an organization or industry "average" without detrimentally affecting the organization's effectiveness while quite possibly increasing its efficiency.

Specialization

Specialization, as represented by the numbers of occupations in an organization, has some interesting implications for organizational performance. Previous research has suggested that increased specialization is associated with increased innovation and creativity which are both inputs into organizational effectiveness.⁴ Although it appears that increased specialization may be positively associated with individual

performance, the relationship with total organizational performance may be negative. Results from the sample of transit organizations illustrate this point. Specialization was negatively correlated with an efficiency measure and positively correlated with a cost measure (Table 5-1). The number of specialists in an organization was negatively correlated with revenue vehicle hours per employee. Since most specialists are employed at the middle-level managerial ranks, they generally do not affect the total revenue vehicle hours which an organization is able to provide. Increased numbers of specialists increases the size of the administrative staffs of organizations which produces a lower figure of revenue vehicle hours per employee. On a per employee basis, then, organizations which employ many specialists and support personnel do not realize proportionately more revenue vehicle hours and are not as efficient. Likewise, the existence of more specialized employees is more than likely to be associated with increased administrative costs which significantly impact the overall organizational budget. Thus the finding that specialization is positively correlated with operating expense per total passenger may be due, in part, to the expansion of overall organizational costs which a specialized staff entails.

In the modern transit organization, specialization at the managerial level has increased, due to the increasingly complex nature of funding, staffing, and monitoring activities. The transit industry today is characterized by an influx of specialists who a decade ago would not have been necessary. The increased need for specialists and their associated support costs have caused transit organizations (especially small ones

⁴See, R. M. Steers, op. cit., p. 65.

where specialized functions classically did not exist) to become more expensive to operate and less efficient. More and more effort in transit organizations is being allocated to managing the external environment of transit regulations with the result that attention to the provision of service is diminished and efficiency impaired.

Centralization

The effects of centralized or decentralized structures on decision-making and organizational performance has been the topic of much debate and a great deal of research during the past 20 years. Historically, an increase in organization size typically brought with it a concomitant increase in centralization of authority and power in the upper echelons of management. As organizations grew and expanded, the disparity between the relevant sources of information for decision-making (which were often located near the bottom of the hierarchy) and the decision-makers themselves become greater, often resulting in poor communications, less than optimal decisions, and reduced effectiveness. During the past 50 years this trend shifted to a more decentralized structure in which organization-wide policy decisions were made at the extreme upper levels of management, while decentralized divisional responsibilities and operating decisions were delegated to the lower managerial levels.

Much of the early research in this area examined the effects of decentralization on employee attitudes and organizational performance. The results of these studies indicated that decentralized organizations

more efficiently utilized human resources and therefore, resulted in increased job involvement and increased performance.⁵

More recent research has pointed out, however, that a relationship between decentralization and both efficiency and effectiveness is not always found in organizations. In fact, in our sample of transit organizations, centralized structures were associated with 2 measures of organizational efficiency, three measures of organizational effectiveness, and 2 measures of employee turnover (Table 5-1). Centralized structures were associated with more revenue vehicle hours per employee, and revenue passengers per revenue vehicle hour as well as with lower operating expense per revenue vehicle hour, per total passengers, and per revenue passenger. Centralized structures were also associated with lower turnover for both managers and operating employees. No single structural variable was characterized by as many (or as consistent) significant relationships with performance measures as was degree of centralization.

These results are not altogether surprising when analyzed in the context of the particular organization environment which characterizes most transit organizations. The term "environment" here, refers to several factors which may mediate the relationship between centralized or decentralized structures and performance. For example, Perrow has espoused a form of contingency theory in which an organization's technology was viewed as the most important source of inter-organizational variations in patterns of influence; that is, the appropriate degree of centralization

⁵See, E. C. Weiss, "Relations of Personnel Statistics to Organization Structure," Personnel Psychology, 1957, 10, 27-42. W. Read, "Upward Communication in Industrial Hierarchies," Human Relations, 1962, 15, 3-15.

was contingent on the routineness of the technology. He suggested that organizations characterized by more routine technologies (such as transit organizations) are best suited to more centralized structures.⁶ Other researchers have suggested similar mechanisms which might account for the appropriateness of a more centralized structure. Among those suggested include concepts of "mechanistic" environments (as opposed to "organic") and varying degrees of integrating and differentiating task situations.⁷ For example, managers would have less inducement to decentralize in a stable environment than in an environment characterized by rapid change and instability, necessitating rapid feedback of accurate information and a timely response to maintain the equilibrium of the organization.

With respect to the tasks of transportation organizations, the type of technology and environment which characterize their operations would seem to require a more centralized form of structure. The associations obtained between the measures of centralization and the performance indicators seems to support this view.

One factor which should be incorporated into a discussion of the effects of centralization on performance is organization size. As transit organizations grow in size, they are almost forced to decentralize some decision-making to lower levels of management. Does this imply that larger, decentralized transit organizations are less likely to be efficient and effective? The answer is not a definite yes or no. Certain

⁶C. Perrow, Complex Organizations: A Critical Essay, Glenview, Illinois: Scott Foresmann, 1972.

⁷See T. Burns, and G. M. Stalker, The Management of Innovation. London: Tavistock, 1961. P. R. Lawrence, and J. W. Lorsch, Organization and Environment, Boston: Harvard University, Division of Research, Graduate School of Business Administration, 1967.

organizational benefits accrue to both decentralized and centralized organizations. For example, some advantages of decentralization are:

1. It facilitates integration and coordination of large organizations characterized by rapidly changing environments.
2. It facilitates management by objectives and the organization of planning at all levels of management.
3. It tends to develop decision-makers at middle and lower levels of management which has a motivational effect.
4. It reduces the decision-making load of top management.
5. It reduces the time required for decision-making.

However, in spite of these advantages, excessive decentralization can have disadvantages:

1. It may add to the cost of supervision if more managers are added to the lower and middle levels.
2. It may lead to suboptimal decision-making--that is, decisions that benefit particular units, but work to the disadvantage of the total organization.
3. It may, in the absence of open communication among all levels of management, lead to loss of control by top management.

The optimal balance between the advantages and disadvantages of decentralization will differ with the characteristics of the individual organization. It does appear to be the case in transit organizations, that some degree of decentralization will occur as the organization increases in size. The extent to which the structure of the organization with respect to centralization or decentralization impacts performance and/or attitudes will depend, not only on the nature of various other organizational and environmental factors, but also on the degree to which

the organization moves toward a decentralized structure. A key principle which must be recognized is that as organizations grow, the decision-making structure is but one structural factor that may undergo change. The fact that various other structural features change concurrently should be acknowledged as a probable co-determinant of any subsequent change in attitudes or performance.

Standardization/Formalization

Standardization and formalization, as stated previously, represent the "how" and the "what" of organizational procedure. The literature suggests that extremely low or high amounts of formalization and/or standardization may have dysfunctional consequences for the organization.⁸ That is, extremely low levels of both may lead to ambiguity and extremely high levels may induce rigidity, neither condition resulting in either improved attitudes or performance.

Experience with the transit organizations in the sample indicated that a range of standardization-formalization exists from an almost total lack of (written) rules, standards, and procedures to systems characterized by extreme "by the book" operations. One major determinant of the existence of standard procedures and written rules and regulations seemed to be the inclination of the General Manager of the organization toward such factors rather than an industry-wide point-of-view that rules, regulations, and procedures are essential management tools. In some

⁸D. C. Pheysey, R. L. Payne, and D. S. Pugh, "Influence of structure at organizational and group levels," Administrative Science Quarterly, 1971, 16, 61-73.

cases, General Managers were quite vocal about their ideas concerning "standard operating procedures," while others felt that each manager had an "understanding" about his/her particular job and responsibility and that this knowledge was "acquired" through experience.

Most of the literature in this area has examined the effects of formalization on organizational performance. Classically, formalization has been examined with respect to the existence of rules, regulations, codified job duties, etc., that govern employee behavior. It has been argued that increased formalization represents a hinderance to effectiveness because managers under highly formalized structures tend to do everything "by the book." Thus, creative, innovative, or adaptive behavior is severely constrained. In fact, four of the five available studies relating formalization to some facet of effectiveness tend to support such a notion.⁹

The analysis of the relationship between formalization and performance in this analysis supports the basic findings in the literature. There was no relationship between formalization and the three efficiency measures. However, formalization did correlate negatively with two effectiveness measures associated with capacity utilization (Table 5-1). Formalization also correlated positively with both managerial and operating turnover. Thus, higher degrees of formalization are associated with lower levels of two effectiveness measures and higher levels of turnover. Although this finding in no way constitutes an indictment of high

⁹See, for example, J. Hage, and M. Aiken, "Program Change and Organizational Properties: A Comparative Analysis," American Journal of Sociology, 1967, 72, 503-519.

levels of formalization, it does lend support to the notion that transit managers would do well to avoid "excessive" degrees of formalization in their organizations. What constitutes "excessive" in an individual organization would entail a more detailed analysis of the personnel component of the organization together with a consideration of such structural measures as size and effects due to the organization's association with municipal, state, or federal bureaucracies.

The effects of standardization on organizational performance have not been explored in the literature to the extent of the formalization research. In many cases, standardization is simply mentioned in conjunction with formalization, although empirical support for any relationships, for the most part, deals exclusively with formalization.¹⁰ Analyses indicated with that standardization was only slightly correlated with one efficiency measure of vehicle utilization and was positively correlated with managerial turnover (Table 5-1). It was apparent in each organization visited that some degree of standard procedure was quite common. In fact, it appeared to be the case that a specific range of activities was pretty much standardized across all organizations. For example, hiring and promoting personnel, performance evaluation, and equipment maintenance procedure activities were all fairly standardized

¹⁰See, L. R. James, and A. P. Jones, "Organizational Structure: A Review of Structural Dimensions and their Conceptual Relationships with Individual Attitudes and Behavior," Organizational Behavior and Human Performance, 1976, 16, p. 104.

in each property. Individual organizations also seemed to be characterized by specific procedures which were also standardized, but the determination of those which were further standardized was more a function of the interests of the particular managers in the organization.

Thus it appears to be the case in transit organizations that some degree of standardization is required in order to ensure that the day-to-day activities of the organization are accomplished with some degree of continuity. As a structural feature of the organization, extreme levels of standardization should be discouraged, since, like formalization, such levels seem to restrict adaptive and innovative activities to the point of dysfunction.

Manager's Length of Employment

Although job tenure is not an anatomical variable, it is an important employee characteristic which has an impact on both attitudes and performance. In the sample, a series of questions were asked concerning the length of time an employee has worked with the particular transit organization--both as a manager and non-managerial employee. This job "tenure" measure was then correlated with the performance indicators associated with each individual's organization. The results were interesting in that management experience correlated very highly with two measures of efficiency and five measures of effectiveness (Table 5-1). Length of employment was related to better ridership statistics, improved vehicle utilization, and lower operating expense per vehicle hour and per revenue and total passengers.

TABLE 5-1
ANALYSES OF STRUCTURE--PERFORMANCE DATA

	Pearson	Significance	
	<u>r</u>	<u>Level</u>	<u>N</u>
<u>ORGANIZATION SIZE</u>			
Percent Population Served	.4362*	.039	14
Revenue Vehicle Hours Per Vehicle	.3575*	.090	15
Operating Turnover	-.5662*	.035	14
<u>SPAN OF CONTROL</u>			
Revenue Vehicle Hours Per Vehicle	.2181	.001	232
Total Passengers Per Revenue Vehicle Hour	.1816	.002	238
Operating Expense Per Total Passenger	-.1095	.046	238
Managerial Turnover	-.1848	.019	180
<u>SPECIALIZATION</u>			
Revenue Vehicle Hours Per Employee	-.4486	.047	14
Operating Expense Per Total Passenger	.5101	.026	15
<u>CENTRALIZATION</u>			
Revenue Vehicle Hour Per Employee	.1574	.008	233
Operating Expense Per Revenue Vehicle Hour	-.1693	.005	233
Revenue Passenger Per Revenue Vehicle Hour	.1600	.007	233
Operating Expense Per Total Passenger	-.2110	.001	239
Operating Expense Per Revenue Passenger	-.2162	.001	239
Managerial Turnover	-.1320	.032	198
Operating Turnover	-.1845	.011	152
<u>FORMALIZATION</u>			
Revenue Passengers Per Revenue Vehicle Hour	-.5023	.030	14
Total Passengers Per Vehicle	-.5070	.032	14
Managerial Turnover	.2181	.002	187
Operating Turnover	.2178	.001	198
<u>STANDARDIZATION</u>			
Revenue Vehicle Hour Per Vehicle	.1181	.036	233
Managerial Turnover	.2262	.003	152
<u>MANAGERS' LENGTH OF EMPLOYMENT</u>			
Revenue Vehicle Hours Per Vehicle	.2095	.007	231
Operating Expense Per Revenue Vehicle Hour	-.1919	.002	231
Revenue Passengers Per Service Area Population	.3176	.001	237
Total Passengers Per Revenue Vehicle Hour	.1486	.011	237
Revenue Passengers Per Revenue Vehicle Hour	.2014	.001	231
Operating Expense Per Total Passenger	-.2104	.001	237
Operating Expense Per Revenue Passenger	-.2501	.001	237

*Kendall's tau

This data would seem to indicate that several employee characteristics are worth considering with regards to their possible effects on organizational performance. Organizations which are characterized by a management force who have more experience in the organization seem to perform better on the whole. The amount of management experience which managers have had in other types of organizations (including transit organizations) does not appear to have as great an impact on overall performance as the total amount of time which each manager has spent on the particular organization, either in a non-managerial or a managerial role. Perhaps the reason for this finding lies in the particular "quality" of information which an individual accrues as a function of his/her membership in an organization. It has often been suggested that a person having more organizational seniority is also more "organizationally intelligent," which means that person knows how to adapt to the demands of co-workers, subordinates, and the organizational situation.¹¹

There has been little, if anything, done in the empirical sense regarding organizational tenure or seniority and performance. What little has been done has focused on individual attributes and individual performance, but no systematic research efforts have been done examining overall organizational performance.

One interesting relationship which should be mentioned is that seniority correlates rather highly with organization size--larger organizations are characterized, to some degree, by a more experienced work

¹¹J. H. Donnelly, J. L. Gibson, and J. M. Ivancevich, Fundamentals of Management (3rd ed.), Dallas: Business Publications, Inc., 1978, p. 228.

force. This can be explained in part, by the fact that larger organizations employ more people and thus the amount of individuals in larger organizations with more work experience is bound to be greater. The important point here is that perhaps gains in performance by larger transit organizations are due, to a significant extent, upon characteristics of the work force in conjunction with structural characteristics which are affected by size.

The characteristics of the sampled property's managerial component has also been affected by recent changes in California legislation. The implementation of the Transit Development Act (SB 325) in 1972 encouraged expansion of transit service in smaller cities and suburban metropolitan areas. Many new managers were hired and these new systems are both less efficient and effective than the older transit systems in the major metropolitan areas of California.

SUMMARY

Several aspects of organizational structure are related with and can possibly affect certain facets of transit organization performance. In terms of efficiency, effectiveness, and turnover rates, it was found that organization size, span of control, centralization, and organizational seniority were all associated with higher levels of organizational performance. Whereas specialization and formalization are associated with lower levels of performance on certain efficiency and effectiveness indicators.

The analysis of these results must be interpreted in light of the level of analysis performed. Certain structural features as perceived by the individual manager (e.g., centralization, standardization, formalization) were associated with organizational level measures of performance. The ideal situation would be one in which individual employee performance data could be used in the analysis with their respective individual structural measures. Unfortunately, such measures of individual output do not exist in any standardized form in the transit industry. Therefore, the study was limited to those measures which were available.

An additional caveat must be mentioned in conjunction with the interpretation of existing measures of structure. This involves the very nature of perceptual measures and their implications for interpreting organizational outcome variables. Within each organization, one may observe several "environments," especially in larger organizations. The "environment" with respect to centralization and formalization, for example, may be perceived by the individual managers in a maintenance department quite differently than by managers in the personnel department. The point is that when we associate individual perceptions of structural elements with organizational-level outcomes, we may be obscuring the resultant association since individual managers may have opposing perceptions of their organization's structure--thereby almost "cancelling out" any significant effect.

These cautions do not diminish the significance of the results. The results confirm relationships which have been proposed regarding certain structure-performance associations. The implication for transit managers, especially those involved in organizational planning, are

significant. One important concept which is partially rejected by the results is that there is "one best way" to organize transit organizations: there are several, depending on the organizational context. However, this chapter demonstrates that certain aspects of organizational structure are associated with transit performance. One might go a step further and use these results to indicate the probable outcome from altering the structure of an existing organization, or consequences for establishing the structure of a new property. But it is important to recognize that the effects of structural variation on performance are likely to be mediated by some third variable or group of variables. Understanding the "contribution" of structural factors to performance requires the recognition of the organizational context and its complexities.

CHAPTER 6
ANALYSIS OF STRUCTURE - ATTITUDE RELATIONSHIPS

This section deals with the relationships between the structural components of transit organizations and the attitudes of the management personnel. The question at hand is whether the structural features are related in any systematic manner to the attitude of the people who are exposed to these features. It is true, of course, that prescriptive management theory has not only made the basic assumption that there are relationships, but, in addition, has made two critical assumptions. The first is that it is possible to be dogmatic about the ideal of some of the characteristics under all circumstances. Prescriptions exist, for example, for a work group size of five, or a decentralized power allocation. The second is that these characteristics can be manipulated by managements at will in order to create higher performing, satisfying organizations. If these assumptions are to provide a valid basis for executive action, then it becomes crucial to know to what degree they are supported by systematic research evidence.

During the past 20 years, more than 100 research studies investigating the relationship between some aspect of an organization's structure and member's attitudes and behavior have been published. Several research efforts have condensed the findings of these studies and have

indicated patterns of relationships between the structural and attitudinal factors.¹

The structural-attitudinal data from the transit organization sample was subjected to analyses which attempts to establish the relationship between certain structural attributes with two measures of managerial attitudes--job satisfaction and organizational commitment. The resultant correlational analyses suggest certain patterns of association which will be discussed with respect to the structure-attitude literature. Following brief overviews of job satisfaction and organizational commitment, each structural attribute which was examined will be discussed in relation to the attitudinal measures.

Job Satisfaction

Job satisfaction is perhaps the most frequently measured job-related attitude in the organizational behavior literature. One reason for the interest in job satisfaction was the widely held belief that people who are satisfied should perform better in organization.² Although the available research does not support such a contention (in fact, just the

¹Three of the most important articles which review the Structural-Attitudinal relationships are: L. W. Porter, and E. E. Lawler, III, "Properties of Organization Structure in Relation to Job Attitudes and Job Behavior," Psychological Bulletin, 1965, 64, 23-51. L. R. James, and A. P. Jones, "Organizational Structure: A Review of Structural Dimensions and their Conceptual Relationships with Individual Attitudes and Behavior," Organizational Behavior and Human Performance, 1976, 16, 74-113. L. L. Cummings, and C. J. Berger, "Organization structure: How does it influence attitudes and performance?" Organizational Dynamics, 1976 (Autumn), 34-49.

²L. W. Porter, E. E. Lawler, III and J. R. Hachman, Behavior in Organizations. New York: McGraw-Hill, 1975.

opposite has been suggested), psychologists still are concerned with it, but now it is seen more as a reaction to one's work and one's organizational membership than as a determinant of one's performance. Thus, satisfaction has become an important type of study in its own right. It has also turned out to be a reasonably good predictor of absenteeism and turnover; the more satisfied the employee, then the less likely he or she is to be absent or to resign from the organization.³ This particular association will be discussed in more detail in Chapter 7.

Commitment

A widely accepted definition of commitment uses the following three statements to characterize commitment to an organization:

1. A strong belief in and acceptance of the organization's goals and values.
2. A willingness to exert considerable effort on behalf of the organization.
3. A strong desire to maintain membership in the organization.⁴

Commitment has also been defined as:

1. Identification - adoption as one's own the goals and values of the organization.

³L. W. Porter, and R. M. Steers. "Organizational, Work, and Personal Factors in Employee Turnover and Absenteeism," Psychological Bulletin, 1973, 80, 151--176.

⁴L. W. Porter, R. M. Steers, R. T. Mowday, and P. V. Boulian. "Organizational Commitment, Job Satisfaction, and Turnover, Among Psychiatric Technicians," Journal of Applied Psychology, 1974, 59, 603-609.

2. Involvement - psychological immersion or absorption in the activities of one's work role.
3. Loyalty - A feeling of affection for and attachment to the organization.⁵

In recent years much interest has been generated by the concept of commitment, its antecedents and its outcomes. In most studies, commitment has been repeatedly identified as an important variable in understanding the work behavior of employees in organizations. Mowday, Steers, and Porter have suggested three reasons why commitment has received this interest.⁶ First, employee commitment to an organization should be a fairly reliable predictor of certain behaviors, especially turnover. Committed persons should be more likely to want to remain with an organization and work toward its goals. Second, the notion of commitment is intuitively appealing to both managers and social scientists. The interest in enhancing employee attachment, almost for its own sake, dates from the early studies of employee "loyalty" which was considered as "socially acceptable behavior" on the part of employees. Third, an increasing understanding of organizational commitment helps us to comprehend the nature of more general psychological processes by which people choose to identify with objects in their environment. It helps to explain how people find purpose in life.

⁵B. Buchanan. "To Walk an Extra Mile: The Whats, Whens, and Whys of Organizational Commitment," Organizational Dynamics, 1975, 3(4), 67-80.

⁶R. T. Mowday, R. M. Steers, and L. W. Porter. The Measurement of Organizational Commitment: A Progress Report. Technical Report prepared with the support of the Organizational Effectiveness Research Program, Office of Naval Research, Contract No. 0014-76-C-0164, NR 170-812, and Department of Management, Graduate School of Management, University of Oregon, Eugene, Oregon, July, 1978.

Relationship Of Commitment To Satisfaction

Several ways have been suggested in which commitment, as an attitude, differs from job satisfaction.⁷ Commitment is more global, reflecting a general affective response to the organization as a whole. Job satisfaction, on the other hand, reflects one's response either to one's job or to certain aspects of one's job. Hence, commitment emphasizes attachment to the employing organization, including its goals and values, while satisfaction emphasizes the specific task environment where an employee performs his or her duties.

In addition, organizational commitment should be somewhat more stable over time than job satisfaction. Although day-to-day events in the work place may affect an employee's level of job satisfaction, such transitory events should not cause an employee to reevaluate his or her attachment to the total organization.⁸

The measures of employee satisfaction and commitment, when considered together, seem to reflect on both the job specific as well as overall organizational attitudes of employees. Porter et al., when comparing an organizational commitment measure with a measure of job satisfaction, suggest that while the two measures are likely to be related attitude

⁷Ibid., p. 5.

⁸L. W. Porter, K. M. Steers, R. T. Mowday, and P. V. Boulian, op. cit. P. C. Smith, L. M. Kendall, and C. L. Hulin, The Measurement of Satisfaction in Work and Retirement. Chicago: Rand-McNally, 1969.

constructs, the relationship found between job satisfaction and organizational commitment should not be overly high.⁹ The results of the Organizational Commitment Questionnaire (OCQ) were correlated with the results of the Minnesota Satisfaction Questionnaire (MSQ) for our sample of transit managers (Table 6-1). As expected, the correlation between the two measures was quite strong.¹⁰

ANALYSIS OF STRUCTURAL-ATTITUDINAL RELATIONSHIPS

Organizational Size

The relationship of organizational size to individual's attitudes is uncertain. Unfortunately, the majority of the comparisons have been made across different sized subunits of a particular organization rather than between organizations like transit properties. A summary of the results of these research studies presents a rather muddled picture regarding the relationship between size and attitudes.¹¹ Both positive and negative relationships have emerged from analyses in various types of organizations. It is perhaps the variety of studies which makes definitive statements regarding the relationship between size and attitude as difficult. The majority of research on size has focused on male rank and file

⁹Porter et al. (1974) compared a measure of organizational commitment with the Job Descriptive Index, a measure which records employee's responses regarding their satisfaction with 5 aspects of their work; the job itself, the supervisor, co-workers, pay, and promotion. See Smith, Kendall, and Hulin, op. cit.

¹⁰All correlation coefficients in this chapter see Pearson coefficients unless otherwise indicated.

¹¹F. T. Evers, J. M. Bohlen, and R. D. Warren. "The Relation of Selected Size and Structure Indicators in Economic Organizations," Administrative Science Quarterly, 1976 (June), 326-342.

or operating employees. Consequently, it was not clear how size of a transit organization might effect managerial attitudes. Also, the interpretation of size has been approached differently by various researchers. This lack of agreement on how to operationally measure size limits comparability across studies.

The results of the analysis between size and job satisfaction for our sample of transit managers produced a positive correlation, albeit a nonsignificant one. The lack of a significant relationship is, however, consistant with some author's contentions which suggest that size has a variable impact on behavior.¹² Size does not seem to be as important as other organizational properties in predicting attitudes. Total organization size is more a static condition, and more dynamic indicators appear to be better predictors. Thus, it should not be embraced as the best predictor of attitudinal consequences.

The analysis of the relationship between organizational size and commitment produced a significantly positive relationship (Table 6-1). This indicates that commitment to the organization is stronger for transit managers in larger organizations than for managers in smaller organizations. This is an interesting finding in the sense that intuitively size may appear to be a negative influence on commitment. However, larger transit organizations may require greater investments from the manager in terms of coordination, control, and innovative behavior, or produce larger groups of peers and additional opportunity

¹²A good summary of this argument is presented in J. M. Ivancevich, A. D. Szilagyi, Jr., and M. R. Wallace, Jr., Organizational Behavior and Performance. Santa Monica: Goodyear Publishing Co., 1977.

for interpersonal interaction which could increase commitment.¹³ In addition, the concept of "empire building" occurs in governmental organizations. A large organization also may increase opportunities for promotion or role enlargement that could enhance the position of the office holder.

Vertical Span

The literature which has examined the effects of vertical span has not produced any clear trends regarding the effects on employee attitudes. Worthy's study of approximately 100,000 employees over a 12 year period was one of the first extensive empirical studies of the potential effects of flat and tall organization structures. He concluded that flat organizational structures could give the advantages inherent in large organizations without the dysfunctional consequences of lower employee morale.¹⁴ Several recent studies have supported Worthy's contention that flat organizational structures produce higher perceptions of job satisfaction in managers than "taller" structures.¹⁵

¹³Discussion of the effects of size on commitment can be found in L. E. Rice, and T. R. Mitchell. "Structural Determinants of Individual Behavior in Organizations," Administrative Science Quarterly, 1973, 18, 56-70. J. V. Baldrige, and R. A. Burnham, "Organizational Innovation: Individual, Organizational, and Environmental Impacts," Administrative Science Quarterly, 1975, 20, 165-176.

¹⁴J. C. Worthy. "Organizational Structures and Employee Morale," American Sociological Review, 1950, 24, 169-179.

¹⁵See, H. R. Jones, Jr. "A Study of Organizational Performance for Experimental Structures of Two, Three, and Four Levels. Academy of Management Journal, 1969, 12, 351-366. H. H. Carpenter. "Formal Organizational Structural Factors and Perceived Job Satisfaction of Classroom Teachers," in Administrative Science Quarterly, (continued)

The results of the data analysis for this study produced negative (though non-significant) correlations between vertical span and both job satisfaction and organizational commitment (Table 6-1). Although this relationship is in the predicted direction of the previously cited research, the relationship was not strong enough to make a definitive statement regarding span-attitudinal relationship for our sample of transit properties. The directions of both correlations indicate that perhaps transit organizations with fewer organizational levels may be associated with more desirable employee attitudes. This finding, however, neither supports nor refutes the results of empirical studies regarding the vertical span-attitude relationship.

Several other influential studies have found insignificant relationships between vertical span and attitudes and have suggested that this relationship may be mediated by other factors such as organization size (i.e., number of employees), and nature of group performance.¹⁶ Based on these findings we can state that positive managerial attitudes (i.e., satisfaction and commitment) seem to be associated with flatter organizational structures in our sample of transit organizations.

(15 continued) 1971, 16, 460-465. E. E. Ghiselli, and J. P. Siegel, "Leadership and Managerial Success in Flat and Tall Organizational Structures." Personnel Psychology, 1972, 25, 617-624. J. M. Ivanevich, and J. H. Donnelly, Jr. "Relation of Organizational Structure to Job Satisfaction Anxiety-Stress, and Performance." Administrative Science Quarterly, 1975, 20, 272-280.

¹⁶L. W. Porter, and E. E. Lawler, "The Effects of Tall vs. Flat Organizational Structures on Management Job Satisfaction," Personnel Psychology, 1964, 17, 135-148. L. W. Porter, and J. Siegel, "Relationships of Tall and Flat Organizational Structure to the Satisfactions of Foreign Managers," Personnel Psychology, 1965, 10, 379-392. R. Carzo, Jr., and J. N. Yanouzas, "Effects of Flat and Tall Organizational Structure," Administrative Science Quarterly, 1971, 16, 460-465.

Span of Control

Perhaps the least researched structural variable with respect to its affect on employee attitudes is span of control. Worthy (1950) departed from the classical idea that small spans of control are superior when he stated that a large span of control is good since it provides better communication and opportunities for individual growth and initiative.¹⁷ His statement apparently did little to motivate research regarding the relationship between span of control and attitude since only one empirical article on the subject has been produced to date. That one study found a positive relationship between number of persons supervised and superior's job satisfaction in a sample of 5,851 U.S. Navy enlisted personnel. Research is also scarce relating span of control to organizational commitment. Based on the findings not directly related to the span of control--commitment issue, Stevens et al., suggest a positive relationship even though the research they cite may indicate either positive or negative relationships.¹⁸

Analysis of the sample of transit managers indicates that both satisfaction and commitment are positively correlated with span of control, with the span of control--commitment relationship being the stronger of the two (Table 6-1). Managers in our sample who were responsible for greater numbers of subordinates had greater feelings of both satisfaction and commitment. Because of the lack of empirical evidence to validate this relationship, we can only speculate regarding the significance of

¹⁷Worthy, op. cit.

¹⁸J. M. Stevens, J. M. Beyer, and H. M. Trice. "Assessing Personal, Role, and Organizational Predictors of Managerial Commitment," Academy of Management Journal, 1978, 21, p. 385.

these findings. Perhaps Worthy was correct when he suggested that larger spans of control provide more opportunities for individual growth and initiative. Indeed, certain approaches to the measurement of job satisfaction have emphasized the role of need fulfillment in determining individual satisfaction levels.¹⁹ It may be that greater spans of control have certain implications for such needs as autonomy or self-actualization.

Job Level

Job levels are strongly related to both attitudes and behavior. The literature demonstrates that perceived job and need satisfactions increased not only from rank-and-file positions to managerial positions but also from lower management positions to middle and upper positions.²⁰ Job satisfaction increases with job level.²¹ Most of the studies on job level have incorporated multiple organizational and/or individual variables and have used more sophisticated analytical techniques than were employed in this study. While there are considerable differences in findings, depending on the method of research used, and while the concept of need satisfaction does not appear to increase consistently with each organizational level, there is a relatively stable pattern of studies

¹⁹L. W. Porter, "A Study of Perceived Need Satisfactions in Bottom and Middle Management Jobs," Journal of Applied Psychology, 1961, 45, 1-10.

²⁰L. W. Porter, and E. E. Lawler, 1965, op. cit., p. 31.

²¹L. L. Cummings, and C. J. Berger, op. cit., p. 37.

that indicate an overall positive association between organizational level and need satisfaction.²²

Analysis of the job level--satisfaction relationship in this research also demonstrated a strong association. Upper level managers in our sample of transit employees expresses significantly more overall job satisfaction than did lower level managers. Although our measure of job satisfaction was not based on a need-hierarchy model, this finding is in general accordance with results reported in previous organizational research.

Perhaps the reasons underlying this finding can be understood in terms of the behaviors which upper-level managers might engage in. Porter has suggested that job level seems to affect the amount of information a person receives in his or her job, the types of interpersonal relationships one might have on a job, and the types and nature of the decisions which must be made in his/her position.²³ We can only speculate in a value-laden manner that perhaps these behaviors are more satisfying to managers in a society which rewards and lends status to more "responsible" positions. It might also be the case that only

²²Porter's need satisfaction questionnaire is used to measure areas of need fulfillment and the importance of these needs to the individual. The measure, based on a need hierarchy system, consists of items measuring (from lowest to highest order) security, social esteem, autonomy, and self-actualization needs as well as the importance of these needs to the individual. Porter found that as individuals moved up the managerial hierarchy, they expressed more satisfaction with or "fulfillment" of upper level needs. Porter also found that upper level managers in large organizations expressed more need satisfaction than upper level managers in smaller organizations, while lower level managers in smaller organizations expressed more need satisfaction than lower level managers in larger organizations.

²³L. W. Porter, and E. E. Lawler, 1965, op. cit., p. 31.

upper level management jobs have the true potential to satisfy such "upper level" needs such as autonomy or self-actualization.

The relationship between job level and commitment was also strong, with upper level managers in our sample scoring significantly higher on a measure organizational commitment than lower level managers. Although there is a lack of previous research examining the effects of job level on commitment, this finding is not surprising based upon what we know about the antecedents of commitment as well as the high correlation between our measures of commitment and satisfaction. Analysis of the relationships between length of employment in an organization and educational-level with commitment later in this chapter may help us to gain a better understanding of the job level-commitment relationship since job level correlates positively with both length of employment in the organization and educational level.

Centralization

There is a paucity of empirical work examining the effects of centralized/decentralized organizational structures on attitudes. Researchers have not produced any support for the idea that decentralization provides either improved job satisfaction or commitment.²⁴

Analysis of our sample data indicated a slight positive relationship between centralization and both commitment and job satisfaction (Table 6-1). The finding indicates that transit managers perceptions of centralization in their organizations are associated to a slight degree

²⁴ Ibid., p. 46; Stevens et al., op. cit., p. 385.

with their expressed levels of satisfaction and commitment. Perhaps the only explanation posited for this relationship has been expressed by Sloan. He stated that in companies where there is a high degree of complementarity among the member's actions, such that one member's actions depends directly upon what his fellow employees are doing, a high degree of centralization is crucial.²⁵ This description of organizational process would seem to characterize the activities of transit managers. At best, we can state that centralization has a negligible affect on attitudes, although some slight positive affect might be expected.

Standardization - Formalization

Standardization is the degree to which procedures relating to management duties as well as the provision of rewards are standardized versus capricious, where as formalization is the degree to which roles are formalized or prescribed in writing versus ambiguous.

Standardization and formalization were both positively associated with measures of commitment and satisfaction (Table 6-1) in our sample of transit managers. This finding is consistent with results reported in studies of various types of organizations. Most transit managers would agree that some formalization and standardization are necessary, the more important issue is attempting to determine what the proper amount should be. For example, the lack of formalized role descriptions has been shown to lead to both role ambiguity and role conflict which may lead to

²⁵A. P. Sloan, My Years with General Motors, Garden City, New York: Doubleday, p. 10, 1964.

TABLE 6-1
ANALYSIS OF STRUCTURAL-ATTITUDINAL DATA

	<u>Pearson r</u>	<u>Significance Level</u>	<u>N</u>
<u>Organizational Size</u> with commitment	.1849**	.002	239
<u>Vertical Span</u> with job satisfaction	-.1789	N.S.*	198
with commitment	-.0262	N.S.	198
<u>Span of Control</u> with job satisfaction	.1446	.013	238
with commitment	.2407	.001	238
<u>Job Level**</u> with job satisfaction	-.2512***	.001	239
with commitment	-.1952	.00001	239
<u>Centralization</u> with job satisfaction	.1326	.021	238
with commitment	.1112	.043	238
<u>Standardization</u> with job satisfaction	.1427	.014	238
with commitment	.1488	.011	238
<u>Formalization</u> with job satisfaction	.1747	.003	236
with commitment	.1484	.011	236

*Not significant.

**Kendall's Tau Statistic was used in this analysis.

***Job level was recorded as 1 = upper level, 2 = middle level, and 3 = lower level.

dissatisfaction and dysfunctional behavior.²⁶ however, research has also demonstrated that extremely high formalization and standardization may have dysfunctional consequences. For example, while a high degree of role prescriptions may lead to less ambiguity, conflict, and anxiety, it may also lead to low task complexity, high group formality, low group involvement, and low satisfaction.²⁷ Such findings would indicate that the relationships of formalization and standardization to individual attitudes may be nonlinear, where an optimum range exists and where deviations from that range are dysfunctional. The implication for transit managers may be that some degree of standardization-formalization is desirable, but that an organization inundated with rules, regulations, and formal procedures will probably result in negative attitudinal consequences.

Length of Service To The Transit Organization (Management Capacity Only)

Although length of service, or seniority is not a structural variable, it is a variable which has some important implications for managers. In line with the structural notion of commitment, length of service suggests the accumulation of organizational resources and the development of an organization career. Other work has demonstrated that organizational commitment increases with years spent in an organization.

²⁶See, R. J. House, "A Path-Goal Theory of Leader Effectiveness," Administrative Science Quarterly, 1971, 16, 485-500. D. C. Pheysey, R. L. Payne, and D. S. Pugh, "Influence of Structure at Individual and Group Levels," Administrative Science Quarterly, 1971, 16, 61-73.

²⁷Pheysey et al., op. cit., p. 65.

It is suggested that time invested becomes a valued resource in itself, while the privileges associated with length of service make it easier to derive additional organizational rewards.

Transit managers in our sample expressed a greater degree of organizational commitment in relation to the length of service they had achieved with their respective transit organizations (Table 6-2). The implications of this result will become more salient in the discussion of the relationship between attitude and performance (Chapter 7). The main finding here is that individual managers express more commitment to their organization as a partial function of the amount of time they spend in the organization.

Educational Level

A negative relationship between an individual's educational level and organizational commitment has been suggested in the literature.²⁸ The findings of this research support that finding. Measures of both overall education level and formal management education correlate negatively with the organizational commitment measure. Overall education level also correlates negatively with job satisfaction (Table 6-2).

One explanation for the finding is that when employees have higher levels of education, it may be more difficult for the organization to provide sufficient rewards (as perceived by the individual) to equalize a perceived exchange based upon what an individual perceives as his/her

²⁸Oscar Grusky, "Career Mobility and Organizational Commitment," Administrative Science Quarterly, 1966, 10, 488-503.

TABLE 6-2
 RELATIONSHIP OF CERTAIN DEMOGRAPHIC VARIABLES
 TO COMMITMENT AND SATISFACTION

	Pearson	Significance	
	<u>R</u>	<u>Level</u>	<u>N</u>
<u>Length of Service to transit organization (Management capacity)</u>			
with job satisfaction	.2105	.001	238
with commitment	.2577	.001	238
 <u>Education level</u>			
with commitment	-.1811	.002	239
 <u>Formal Management Education</u>			
with commitment	-.1239	.029	236

inputs/outcomes ratio. Hence, more educated people would be less committed to the organization and perhaps more committed to a profession or trade.²⁹

Another explanation for this finding may be that managers with more formal management training have greater perceptions of career mobility, and thus feel that they are qualified to work in various organizational settings--possibly reducing their commitment to their current employer. It appears that the highly educated manager may not necessarily be the most satisfied or committed employee in the organization.

SUMMARY

The tone of this chapter has been cautious. Considering the evidence in the literature as well as the results of our own research, such a conservative prospective is warranted. Although several important structural-attitudinal relationships proved to be statistically significant, the correlation coefficients are of such a magnitude that causal statements regarding structure-attitude relationships should be discouraged. Simple cause-effect statements cannot be made regarding key relationships; a more practical statement might be that the effect of X on Y depends on Z. As Porter and Lawler have suggested, not only are relationships between two variables affected by the interaction of some

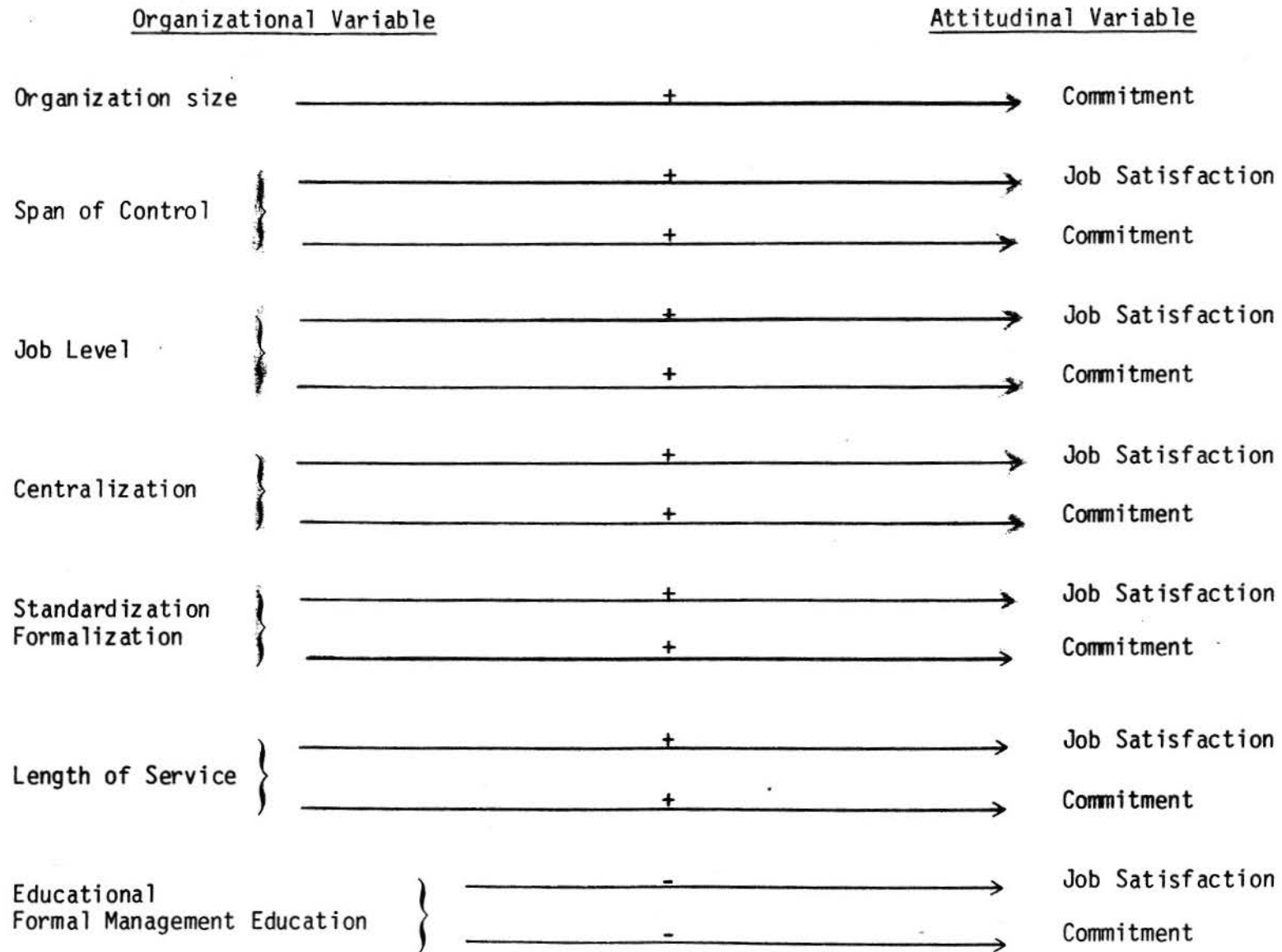
²⁹R. M. Steers, "Antecedents and Outcomes of Organizational Commitment," Administrative Science Quarterly, 1977, 22, 45-56.

third variable, the evidence also demonstrates that the direction of observed effect may very well depend on relatively local and particularized conditions.³⁰ The authors urge extreme caution when interpreting the effects of structural variables on employee attitudes.

There are several key relationships linking structure and attitudes which have produced some consistent, though moderate results. Figure 6-1 presents an overview of these relationships with the + and - signs indicating either positive or negative correlations. Relatively larger spans of control, high job levels, centralized structures, moderate levels of both standardization and formalization, and job seniority showed varying degrees of association with higher levels of both job satisfaction and commitment. Organization size was positively associated with organizational commitment. Level of education and formal management education were both negatively related to job satisfaction and commitment. "Taller" organizational structures were negatively related to both satisfaction and commitment, though not significantly so.

³⁰L. W. Porter, and E. E. Lawler, op. cit., p. 46.

FIGURE 6-1
SUMMARY OF STRUCTURE-ATTITUDE RELATIONSHIPS



CHAPTER 7

ANALYSIS OF ATTITUDE - PERFORMANCE DATA

Does increased job satisfaction and commitment lead to higher productivity? Does job dissatisfaction result in restriction of output? These types of questions have been the topics of research for almost half a century. Popular opinion apparently views job attitude as having a direct affect on performance. Somehow it seems natural that more positive feelings about work would lead to greater output and higher quality. Unfortunately, four decades of research into this issue give little basis for such a conclusion. Most reviews of the literature usually produce only the barest of evidence supporting a direct link between attitudes and performance. While the obtained relationships are almost always positive, the median correlations between measures of attitude and productivity are usually low--rarely over .20.¹

Deficiencies in measures of performance might constitute one explanation for the inconclusive relationship. Many jobs do not lend themselves to objective performance measures, and often total organizational

¹Some excellent reviews and key articles which document important attitude-performance relationships include: A. H. Brayfield, and W. H. Crockett, "Employee Attitudes and Employee Performance," Psychological Bulletin, 1955, 52, 396-424. V. H. Vroom, Work and Motivation, New York: Wiley, 1964. E. E. Lawler, III, and L. W. Porter, "The Effect of Performance on Job Satisfaction," Industrial Relations, 1967, 7, 20-28. R. T. Mowday, R. M. Steers, and L. W. Porter, The Measurement of Organizational Commitment: A Progress Report. Technical Report No. 15, Graduate School of Management, University of Oregon, Eugene. Prepared with the support of the Organizational Effectiveness Research Program, Office of Naval Research, Contract N00014-76-C-0164, NR 170-812.

performance measures have to be used in place of individual--level measures. A second explanation could be that, in many instances, individual performance level simply cannot vary to any great extent. When employees are paced by technological constraints, they can hardly work at a level beyond that of the total work flow. The work of a coach operator is a good example of this process.

The cumulative impact of the empirical studies has forced organizational theorists to revise their thinking about the nature of the linkage between attitude and performance. The consensus of evidence and opinion on just how the two are connected can best be represented by the argument of Lawler and Porter.² They suggest a model which draws linkages between the key variables of performance, rewards and satisfaction. According to their model, there are many cases in which we ought not to expect much correlation between job satisfaction and performance. If a job holds little potential for intrinsic rewards (gratifications for doing a job well or in having used one's abilities to solve a problem or meet some challenge), and if extrinsic rewards (such as salary increases and other reinforcers controlled by the organization) bear little relationship to individual performance, then the resultant connection between performance and satisfaction is weak and tenuous. In any case, whatever connection does exist is due not to the casual effect of satisfaction on performance, but to the fidelity with which rewards follow performance. Thus the emphasis has shifted from a satisfaction performance linkage to more of a performance satisfaction one, in which the mediating effect of rewards becomes salient.

²Lawler and Porter, op. cit.

Data Analysis

From the sampled transit organizations, measures were obtained for the two most commonly studied attitude variables--job satisfaction and organizational commitment. The results on these variables were then correlated with the performance indicators for efficiency and effectiveness (Table 7-1).

The results of our data analyses demonstrate general support for the research literature findings. Both job satisfaction and organizational commitment correlated significantly with most of the efficiency and effectiveness measures. Both job satisfaction and organizational commitment were positively related to revenue vehicle hours per employee--an efficiency measure of labor productivity. Both attitude measures were also significantly related to lower overall operating expenses as well as overall market penetration. It is interesting to note that both attitude variables correlated more highly with the effectiveness indicators than with the efficiency indicators. Thus the general trend of the relationships tends to support the performance → satisfaction linkage cited earlier. The organizational commitment measure correlated negatively with turnover among transit operators which tends to support research which suggested that organizational commitment discriminated better between "stayers" and "leavers" than did the various components of a measure of job satisfaction.³

³L. W. Porter, R. M. Steers, R. T. Mowday, and P. V. Boulian, "Organizational Commitment, Job Satisfaction, and Turnover Among Psychiatric Technicians," Journal of Applied Psychology, 1974, 59, 603-609.

TABLE 7-1
ANALYSIS OF ATTITUDE--PERFORMANCE DATA

	<u>Pearson r</u>	<u>Significance Level</u>	<u>N</u>
<u>JOB SATISFACTION</u>			
Revenue Vehicle Hours Per Employee	.1368	.018	233
Operating Expense Per Revenue Vehicle Hour	-.2135	.001	233
Revenue Passengers Per Service Area Population	.1287	.023	239
Operating Expense Per Total Passenger	-.1537	.009	239
Operating Expense Per Revenue Passenger	-.1734	.004	239
<u>ORGANIZATIONAL COMMITMENT</u>			
Revenue Vehicle Hours Per Employee	.1121	.044	233
Revenue Vehicle Hours Per Vehicle	.1111	.045	233
Operating Expense Per Revenue Vehicle Hour	-.2926	.001	233
Revenue Passengers Per Service Area Population	.1368	.017	239
Operating Expense Per Total Passenger	-.1537	.009	239
Operating Expense Per Revenue Passenger	-.1734	.004	239
Operating Turnover	-.1521	.016	198

The important factor in the analyses is the consistent pattern of relationships between the attitude and the performance variables. It appears to be the case in the transit organizations studied that a clear association exists. The critical question has to be centered around the interpretation of these findings and their usefulness to the transit manager.

Implications for Management

Perhaps the most general conclusion to be drawn from the research findings is that transit managers must recognize the dilemma and find some way to resolve it. The dilemma is that contemporary managers are concerned with two sets of objectives: organizational performance and employee attitudes (or quality of working life). Many managers assume that the two goals are causally linked in a direct manner such that if job satisfaction is enhanced, productivity will also be improved. However, the results of the research which has been done linking attitudes and performance indicates that employee attitudes and productivity do not necessarily follow parallel paths.

This does not mean that the two objectives are incompatible, for there is evidence that it may be possible to achieve them together. Nor does it mean that the two goals are independent of each other. Under certain conditions, improving productivity will enhance worker attitudes and improvements in attitudes will contribute to performance. What it does mean is that there is no automatic and invariant relationships between the two. Indeed, the two objectives are so loosely coupled (there are so many intervening links between them, and the relationship is so

indirect) that efforts which aim primarily at improving worker satisfaction on the assumption that productivity will automatically increase are more likely than not to leave productivity unchanged, or at best to improve it marginally. They may even cause it to decline. A careful analysis of the findings shows that management schemes and technologies currently being proposed on the assumption that both attitudes and productivity will improve have been met with minimal or questionable impact in a variety of organizations.⁴

There exists a wide array of methods available for improving job attitudes or performance, but each of them characteristically tackles some partial aspect of the worker's relationships to their jobs: their financial incentives, their control over their work, their working conditions, their social relationships, or their labor-management relations. No one of these, it seems, is ordinarily enough to affect both performance or attitude significantly, although in some instances improvements in one or the other objective may be realized. Significant changes or improvements in performance or attitudes requires that an integrated combination of methods, which relate the human to the economic concerns, must be used in order to bring about improvements in both areas simultaneously.

Improving both performance and attitudes is complicated by two major obstacles: inadequate knowledge and resistance to change. The knowledge obstacle derives from the aforementioned need for using a variety of

⁴Examples of such techniques include job enrichment, management by objectives and participatory management.

methods rather than any single approach, and the requirement that these be adapted skillfully to each work setting. The multiple sources of resistance to change constitute a communications obstacle in the broad sense of the term. For example, the real or perceived adversary relations between management and employees operating as an organized bargaining unit obstructs communication. Managers may think that efforts to improve employee attitudes will detract from programs to improve efficiency. Also workers may see efforts to improve performance as exploitation or threatening to job security.

The problem for management in general, and the policy-maker in particular, is that in order to effect improvements in the productive use of human resources, numerous and interrelated changes must be made before the desired effects are achieved. However, the organizational resistances to change in a transit agency requires that the changes be introduced cautiously, and incrementally. While it would be hard to exaggerate the difficulties of the task, this does not mean that they cannot be overcome in time, given adequate knowledge and sufficient "statesmanship" on the part of both management and labor.

SUMMARY

Job satisfaction and commitment are two criteria by which we evaluate organizations. The importance attached to satisfaction and commitment rest on such humanistic values as the effects of job satisfaction on mental and physical health; establishing and maintaining the legitimacy

of an organization's existence and purpose, and facilitating social interaction within organizations. The literature suggests that job satisfaction tends to be highest among workers over age 35 and among professional and managerial workers. Also, income, autonomy, intrinsic psychological rewards from work, and social rewards from group membership appear to be some of the more important determinants of job attitudes in the contemporary work force. Initial expectations of satisfactions that will be derived from the job are also important, younger employees with college degrees are most likely to have job expectations that will not be realized by on-the-job experiences.

Employees with higher levels of satisfaction and commitment, will exhibit lower levels of absenteeism and turnover, but not necessarily higher productivity on an individual level. However, our analyses produced a consistent and positive association between higher levels of individual managerial commitment and job satisfaction with measures of both efficiency and effectiveness. In light of the current literature and research, it is important to note that the contingency of rewards--both intrinsic and extrinsic--on performance determines whether job attitudes and productivity are closely related.

The basic question for transit managers, then, is whether the transit organization should strive for a high positive relationship between attitudes and performance. On the one hand, the answer is yes, since satisfied and committed people tend to remain longer in the organization. If the performance-satisfaction connection is strong, the ones who stay will be more productive employees, and turnover will be more likely to occur among the less productive people. On the other hand, we must remember

that not all transit organizations have "performance problems." Some large organizations would be satisfied with routine individual performance if they could just count on a sufficient number of people to show up for work to accomodate each shift. For such organizations, a confrontation with job attitude problems would clearly make more sense than would efforts to manipulate satisfactions through an indirect and discriminative strategy based on the reward system. Transit managers have to decide whether their primary problem is performance on the job or excessive labor costs due to absenteeism and/or turnover. The two problems call for different managerial responses.

PART III
CONCLUSIONS

CHAPTER 8
SUMMARY OF FINDINGS AND IMPLICATIONS

This study investigated the relationships between structural, attitudinal, and performance variables in 16 fixed-route bus systems located throughout California. Data for the study was collected from organizational archives, personal interviews, management surveys, and on-site observation. Statistical analyses focused on the associations between structural and attitudinal variables and elements of organizational efficiency and effectiveness.

In this chapter the cumulative results of the research are reviewed in three sections. First, Table 8-1 presents a review of the major associations and respective propositions which were examined accompanied by a brief comment on the results of the analysis. Second, several distinct aspects of the analyses, which correspond to Chapters 4-7, will be summarized and discussed with respect to implications for transit organizations. And, finally, future directions for research are introduced.

Our analyses indicate that the structure of transit organizations is associated with both employee attitudes and organizational performance that is consistent with organizational theory and research findings. Among the 23 specific associations examined, only two were not supported while two others received only partial support (Table 8-1). In general, propositions which were made regarding transit organization structure, attitude and performance variables, based on research completed in other types of organizations, were supported.

TABLE 8-1
SUMMARY OF STRUCTURE-ATTITUDE-PERFORMANCE RELATIONSHIPS*

PREDICTED ASSOCIATION

RESULTS

Structural Relationships

1. Organization size is positively associated with the number of subdivisions in the organization.
2. Organization size was expected to lead to increased specialization and a higher level of specialist qualifications.
3. Organization size should be positively associated with both the vertical span of the organization as well as the number of departments.
4. Organization size should be negatively associated with a measure of the size of the administrative component. A slight curvilinear trend should be apparent, such that beyond a certain size, the proportion of persons engaged in administration decreases.
5. A strong positive association is predicted between organization size and measures of standardization and formalization.

1. SUPPORTED - A strong positive correlation was found between organization size (measured both by the number of buses and total number of employees) and number of subdivisions.
2. SUPPORTED - One of the strongest relationships in the analysis of the structural components of transit organizations was that of size and the number of specialties.
3. SUPPORTED - A strong positive relationship was found between organization size and both vertical span and number of departments.
4. SUPPORTED - a strong negative correlation emerged between size and the administrative component measure. Proportionately fewer administrative personnel were employed as organizations grew large.
5. PARTIALLY SUPPORTED - Although the observed relationships were significant and in the predicted direction, they were not particularly strong. Rules and procedures are fairly standard across all sizes of transit organizations, with larger organizations having slightly higher levels.

*Appendix I, pp. 139-140 provides definitions of terms.

PREDICTED ASSOCIATION

6. A negative relationship was predicted between organization size and centralization of decision making.
7. A negative relationship was proposed between centralization and measures of formalization and standardization.
8. A negative association was proposed between centralization and vertical span.

RESULTS

6. SUPPORTED - The analysis of data supports the negative relationship between size and centralization. As transit organizations get larger there is a tendency toward decentralization of decision making.
7. SUPPORTED - Analysis of the data indicates that as organizations become more centralized there is a significant decrease both in formalization and standardization.
8. SUPPORTED - A significant negative correlation was observed between centralization and vertical span reflecting the relative absence of delegation in centralized transit organizations.

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STRUCTURE-PERFORMANCE RELATIONSHIPS

1. Size was predicted to be positively associated with organizational performance.
2. Span of control was expected to be associated with higher levels of organizational performance, although the support for this idea in the literature was weak.
3. Specialization is predicted to be related to higher levels of organizational performance.

1. PARTIALLY SUPPORTED - Size was not significantly correlated with any efficiency measures, though one of the measures (vehicle hours per vehicle) was closely associated with size. Size was correlated with one effectiveness measure (population served).
2. SUPPORTED - Higher utilization of vehicles, more passengers and lower operating cost per passenger were correlated with managerial span of control. Also, managerial span of control was negatively correlated with managerial turnover.
3. NOT SUPPORTED - Specialization was found to correlate negatively with vehicle utilization per passenger and positively with operating cost.

PREDICTED ASSOCIATION

4. No specific predictions were made regarding the effects of centralization on organizational performance. The research evidence regarding this issue is mixed. However, considering the nature of the organizational environment in transit properties, a positive relationship may be posited between centralization and performance.
5. Higher degrees of formalization should be associated with lower levels of organizational performance.
6. Manager's length of employment is proposed to be associated with higher levels of organizational performance. Length of employment can be interpreted as a by-product of management experience.

RESULTS

4. SUPPORTED - Centralized structures were associated with more revenue vehicle hours per employee, revenue passengers per revenue vehicle hour, as well as with lower operating expenses per revenue vehicle hour, per total passenger, and per revenue passenger. Centralized structures were also associated with lower turnover for both managers and bus operators. No single structural variable was characterized by as many significant relationships with performance measures as was degree of centralization.
5. SUPPORTED - Formalization measure correlated negatively with two measures of capacity utilization. Formalization also correlated positively with both managerial and bus-operator turnover.
6. SUPPORTED - Management experience was correlated highly with two measures of efficiency (vehicle utilization and cost of producing service) and five measures of effectiveness. The amount of management experience which managers have had in other types of organizations (including transit organizations) does not appear to have as great of an overall impact as the total amount of time each manager has spent in his/her present organization.

PREDICTED ASSOCIATION

RESULTS

Structure-Attitude Relationships

1. No predicted direction was expected concerning the relationship between size and attitudes since the literature in this area presents an extremely mixed picture.
2. Although the literature which has examined the effects of vertical span (number of hierarchical levels) has not produced any clear trends regarding the effects on employee attitudes, recent research has supported the contention that "flat" organizational structures produce greater levels of satisfaction than do "taller" structures.
3. Span of control (number of persons supervised) should be positively associated with measures of both job satisfaction and organizational commitment, although the literature in this area is scarce and not overwhelmingly supportive.
4. Job level is positively associated with amount of job satisfaction and commitment in a managerial sample. That is, job satisfaction and commitment to the organization increase as individuals move up the management hierarchy.

1. The results of the analysis between size and job satisfaction produced a positive, though insignificant correlation. However, the analysis of the size-commitment relationship produced a significant positive correlation. Thus it appears that managers in larger organizations are more committed to their respective organizations than managers in smaller organizations.
2. NOT SUPPORTED - The results of the data analysis produced negative, though non-significant, correlations between vertical span and both job satisfaction and organizational commitment. Although the relationships were in the predicted direction, the relationship was not strong enough to make a definitive statement regarding the vertical span-attitudinal relationship.
3. SUPPORTED - Both satisfaction and commitment were related with larger spans of control, with the span of control-commitment relationship being the stronger of the two.
4. SUPPORTED - Upper level managers expressed significantly higher levels of both job satisfaction and commitment than did lower level managers for the entire sample of transit managers.

PREDICTED ASSOCIATION

RESULTS

5. No relationship was predicted concerning the relationship between centralization and either satisfaction or commitment. Researchers have not produced any support for the idea that decentralization provides either improved job satisfaction or commitment.
6. Standardization and formalization should be associated with higher levels of both satisfaction and commitment. Extreme levels of either variable, however, may have dysfunctional affects on employee attitudes.
7. Length of service to the transit organization (transit managers only) is positively associated with management attitudes.
8. A negative relationship is suggested between an individual's educational level and his/her commitment to the organization.

5. Analysis of the data indicated a slight positive relationship between degree of centralization and both commitment and satisfaction.
6. SUPPORTED - Standardization and Formalization were both positively associated with measures of commitment and satisfaction.
7. SUPPORTED - Transit managers in our sample expressed a greater degree of organizational commitment in relation to the length of service they had achieved with their respective transit organization.
8. SUPPORTED - Measures of both overall educational level and formal management education correlate negatively with the organizational commitment measure. Overall educational level also correlated negatively with job satisfaction.

ATTITUDE-PERFORMANCE RELATIONSHIPS

1. A positive association is predicted between managerial attitudes and organizational performance. In general, most research in this area has produced weak evidence supporting a direct link between attitudes and performance. While the obtained relationships are almost always positive, the median correlations between measures of attitude and performance are usually low.

1. SUPPORTED - The results of the data analysis demonstrate general support for a relationship between higher levels of expressed satisfaction and commitment with measures of organizational performance. Both attitude variables correlated more highly with the effectiveness indicators than with the efficiency indicators.

Structural Relationships

The primary purpose of this analysis was to determine the overall effects of variations in transit organization size on other structural features of organizations. It was anticipated that patterns of relationships could be established which could serve as guidelines for structuring organizations, pending subsequent analyses of structure-performance variables. Specific conclusions regarding the particular analyses were:

1. Organization size is positively associated with the number of subdivisions in the organization. Larger organizations tend to consist of more than one operating site, either due to the size of the geographical areas serviced or to the limited space available for vehicle maintenance and parking facilities. The main implications for this finding lie in the area of transit facility planning. Several instances were encountered in which expanding transit organizations had literally "outgrown" their physical facilities without anticipating the problem. Expansion plans had failed to provide adequate solutions for organizational growth. For example, a transit organization planning to double its capacity should realize that more than a doubling of property and facilities will be required to handle the increase in persons and equipment. Even though this conclusion may seem to be self-evident, several cases were established in our own small sample of transit organizations which demonstrate that professional planning for expansion is needed.

2. Increases in organization size lead to increased numbers of specialists and levels of specialization. As transit properties increase in size, management functions tend to become more specialized. Modern transit organizations are moving away from the management generalist towards specialization. Public relations specialists, planners, and finance and personnel managers are now commonplace. A consequence of this trend is the increasing dissatisfaction over inter-departmental communications. Increased specialization has implications regarding the coordination of functions within an organization. Many of the management problems in expanding organizations characterized by increasing numbers of specialists can be traced to a lack of understanding, and/or coordination among specialized individuals or groups. Transit organizations which are expanding and becoming more specialized need to develop more sophisticated communications systems and programs which facilitate and encourage intra- and inter-departmental coordination. Although MBO approach would aid transit organizations no examples were observed in the sample, although three systems were involved in goal analysis.

3. Larger organizations tend to be characterized by "taller" management structures, i.e., more levels of management, as well as more differentiation by departmental function. The results of our analyses indicate that once beyond a certain range of organization size, most transit organizations are characterized by a structure which includes between 4 and 6 distinct managerial levels, ranging from first-level supervisor to general manager. It appears to be the case that such levels of hierarchy are necessary in order to assure that each manager operates within a range of responsibility in keeping with his/her knowledge and capabilities.

Larger spans of control in management appears to have benefits. Larger spans of control were associated with lower management turnover, lower overall operating expense per passenger, and better vehicle utilization and ridership. Perhaps managers who are responsible for more employees perform their duties more effectively and gain more satisfaction. And fewer managers have a direct impact on the cost of producing service.

4. Increased organizational size was associated with higher levels of both standardization and formalization. Certain rules and procedures appear to be standard across all sizes of transit organizations. Larger organizations tend to have higher levels of both formalization and standardization.

Organizations which are characterized by extremely high degrees of formalization and/or standardization, may in fact be inhibiting certain behaviors or activities which improve organizational performance. Organizations characterized by extreme "by the book" mentalities are rarely characterized by creative management behaviors. Likewise, a lack of formalized or standardized guidelines can have potentially disruptive effects. Managers who claim that procedures are simply "understood" generally demonstrate a lack of foresight that can be detrimental to an organization characterized by rapid growth or unexpected modification.

5. A negative relationship was found between organization size and degree of centralization of decision-making. Thus, as transit organizations grow, decision-making authority is delegated further down the ranks of management. Upper-level managers who attempt to maintain absolute control over management functions may actually inhibit the functions of the organization. Likewise, managers who over-delegate authority may

lose essential power to control the overall functioning of the organization as well as create extremely autonomous work groups or departments which may result in intra-organizational conflict.

Structure-Performance Relationships

The primary goal of this analysis was to establish the associations between various structural aspects of transit organizations and certain measures of organizational performance. Three efficiency and six effectiveness measures were used as standard performance indicators together with measures of employee absenteeism and turnover. Specific conclusions regarding the particular analyses are presented below.

1. Organization size was not strongly related to the performance measures. Although a good deal of interest has focused on the issue of how the size of an organization may influence various aspects of organizational success, a clear pattern of relationships did not emerge. Several interesting observations can be made based upon the statistical analyses and discussions with the general managers of each property. Larger organizations tend to be more effective, due to the increased resources and scale of operations. However, it appears that, in the transit industry, an organization which emphasized effectiveness goals almost invariably does so at the expense of efficiency. This phenomenon is probably best interpreted in light of the nature of the modern transit industry and its increasing dependence upon government funds. In private organizations which do not rely on external operating income, it is possible for a given organization to be efficient without being effective,

at least in the short run; but it is much less likely that effectiveness will continue over the long run if efficiency is disregarded.

By contrast, in the transit industry, if sufficient funds are available from governmental sources without stringent requirements for efficiency it is highly desirable for management to be effective but not necessary for them to be efficient. Thus a negative attitude toward efficiency may develop. Transit management emphasizes the achievement of effectiveness objectives and seeks additional funds so as to extend the benefits of transit without regard to the cost of producing the service. An example of this process in the transit industry is the use by managers of the term cost effectiveness. By definition, in this cost-effectiveness context there are two standard criteria. The first is that a system is more efficient when it gives more units of effectiveness for a given dollar. The second states that a system is more efficient if it means less cost per unit of effectiveness.¹ These criteria clearly indicate that, no matter how a unit of effectiveness is defined, the primary focus of cost effectiveness is reduced cost. In fact, the principle goal is to reduce cost without reducing the specified capability of a given transit organization. Basically, then, cost effectiveness is efficiency inflated with the misnomer of effectiveness.

It appears to be the case in many transit organizations, that effectiveness goals gain prominence over those related to efficiency in part because of the nature of governmental subsidies.

¹J. G. Albert. "Structuring Cost Effectiveness Analysis," in Modern Management: Issues and Ideas, ed. David R. Hampton. Belmont, California: Dickenson, 1969, p. 237.

The effects of organization size on efficiency and effectiveness are muted by the nature of the modern transit industry. Increases in organization size, while possibly being accompanied by slight gains in service effectiveness, are also accompanied by increased costs of operation. One example of this is found in the association between the degree of specialization in larger organizations and total organizational costs. While higher degrees of specialization may be called for in larger organizations in order to maintain adequate levels of performance, these increased degrees of specialization do not appear to be related with any significant increased levels of performance and, in fact, represent significant costs to the organization which adversely affect labor efficiency.

One factor which affects organizational performance measures is the total number of managers in the organization. Transit organizations characterized by "lean" management staffs (larger spans of control) generally exhibit higher levels of both efficiency and effectiveness. It is hard to determine exactly which new types of specialized activities are essential as an organization increases in size. It was apparent in the site visits that certain general managers were more inclined towards "leaner" management staffs. The result was that each manager performed functions which, in organizations characterized by more specialist functions, might be delegated to separate staff personnel. While the effects of fewer managers did not seem to adversely affect overall organizational effectiveness, organizational efficiency increased significantly.

It should be noted that this phenomena was observed in smaller and medium size organizations. In larger transit properties, greater

specialization of activities is warranted. However, larger transit organizations have not developed management plans which use increased specialization to achieve increased efficiency.

2. The degree of centralization was positively associated with two measures of efficiency, three measures of effectiveness, and was negatively associated with levels of turnover for both managers and bus drivers. No single structural variable was characterized by as many significant relationships with performance measures as was the degree of centralization. One factor which seems to moderate this relationship is the job technology which characterizes the work environment. In the transit industry, the technology can be described as relatively stable, even static. Such conditions of stability seem to be more conducive to a centralized management structure. If transit technology was one of dynamic innovation and rapid change, perhaps a more decentralized structure would improve performance. However, the stable nature of the transit industry seems to require more centralized control, which ensures a more coordinated and consistent output. A management team of four or five, who organize the responsibilities of a flexible professional staff and direct the activities of the supervisors of operations and maintenance could have the capabilities needed for transit management.

3. Transit organizations which are characterized by extreme levels of formalization were found to exhibit higher levels of employee turnover. Also, excessive formalization was negatively correlated with two effectiveness measures. These results are difficult to interpret because some formalization is required in most organizations. Transit managers must determine what level of formalization is appropriate for different

departments. They should also keep under careful scrutiny employee impressions and attitudes about rules and procedures. There are some departments and personnel who want (and sometimes require) a highly formalized work environment; others respond to less formalization.

Transit organizations undergoing expansion must review existing rules, regulations, and procedures. Increasing number of specialists, especially in areas such as personnel, finance, and planning may necessitate different levels of formalization than those adopted for operating personnel.

4. Manager's length of employment or job tenure was associated with higher degrees of organizational performance. In fact, individual organizational averages of managerial work force experience was correlated highly with two efficiency and five effectiveness indicators. The amount of management experience which managers had in other types of organizations (including transit organizations) does not appear to have as great of an overall impact as the total amount of time each manager has spent in his/her present organization.

These findings reinforce the notion that organizational attachment or sustained membership represents a desirable achievement for transit organizations. Managers must consider the main factors that influence individuals to remain with and participate in the activities of transit organizations. The literature reviewed suggested that continued attachment is strongly and positively related to overall job satisfaction.

The question still remains as to why managers are satisfied or dissatisfied; or what can be done to improve satisfaction and commitment. Available evidence supports the notion that certain key factors which may

act to ensure continued attachment should be examined including: (1) the establishment of appropriate objectives for the transit system and each manager's contribution, (2) the rewards available to managers in exchange for suitable performance, (3) efforts made to ensure that the expectation levels of entering managers are realistic, and (4) that the span of control allocated to managers provide opportunity for growth and initiative.

Structure - Attitude Relationships

The purpose of these analyses was to determine the associations between certain structural characteristics and employee attitudes (job satisfaction and commitment measures). Many of these analyses provide examples of how variations in organizational structure can influence behavior.

1. Overall organization size was found to relate to more positive levels of job satisfaction and significantly higher organizational commitment on the part of transit managers. Larger organizations seem to be related positively to job satisfaction and thus to the employee's tendency to stay in the job rather than leave the organization. Again, it should be emphasized that an additional component of organizational size is the size of the subunits, or departments, that make up the total organization and constitute the immediate work environment of the individual manager. An organization may be extremely large, yet be made up of extremely small work units or teams, which would have extremely high morale. Conversely, a relatively small organization might consist of several large work units in which satisfaction and commitment are extremely low. It is the size of subunits within organizations and their

effects on job satisfaction which should be considered by transit managers when altering organizational structure.

At present, it seems safe to state that size has a variable impact on behavior. It probably acts in combination with other organizational properties in affecting behavior. Size is a fairly static condition, and more dynamic indicators appear to be better predictors.

2. Analyses of the effects of vertical span on attitudes is interesting, but, like the size factor, it does not appear to be as important as some of the contextual variables. This is not to say that shape has no importance in predicting behavioral consequences, but that it is one of the numerous features and dimensions that are interrelated. Transit managers need to diagnose how employees are influenced by shape, if at all, before reaching a conclusion on how an organization or unit should be shaped. Individual preferences and specific managerial tasks may influence the appropriateness of various "shapes."

The analyses suggests that extremely "tall" organization structures may be negatively associated with measures of both job satisfaction and organizational commitment. Although the correlations in this analysis did not attain desirable levels of significance, the general direction of the relationships tend to support the hypothesis that "flat" organizational structures produce greater levels of satisfaction than do "taller" structures.

3. Manager's span of control was positively associated with measures of both job satisfaction and organizational commitment. Thus, considering the relatively stable technology of transit organizations, wider spans of control seem to be conducive to positive employee attitudes.

Extremely "tight" or narrow spans of control, especially at the lower management levels, should be discouraged in fixed-route transit systems.

4. Managers job level was found to be significantly associated with the amount of both job satisfaction and organizational commitment. Upper-level managers expressed greater satisfaction and commitment than lower-level managers. The implication of this finding for managers centers around the focus of efforts to improve managerial attitudes. Perhaps upper-level managers require less attention concerning their levels of satisfaction and commitment. Efforts on the part of management to improve employee attitudes might best focus attention on lower and middle-level managers.

5. Analyses of the data indicate a slight positive relationship between the degree of centralization and both commitment and satisfaction. This finding adds further support to the proposition that transit organizations, with their relatively stable technology and "environment," are suited to more centralized organizational structures. While suggesting more centralized structures, an excessive centralization is not endorsed. Rather, on a continuum from extremely centralized to extremely decentralized, a structure located between these two extremes and slightly toward the centralized end, would appear to enhance performance.

6. The importance of both standardization and formalization was again reinforced in this analysis. Both variables were positively associated with the satisfaction and commitment measures.

Considering the nature of the transit manager's tasks, a certain degree of formalization should be considered. However, the relationship between formalization and attitudes is not linear. Extremely low or high

levels of formalization will more than likely result in dysfunctional behaviors and decline in employee attitudes.

7. Transit managers in our sample expressed greater degrees of organizational commitment in relation to the length of service they had achieved in their respective organizations. This finding again supports the value of employee retention in fixed-route transit organizations. More effort on training existing employees for advanced managerial positions is warranted.

Attitude-Performance Relationships

The primary purpose of this analysis was to determine the association between managerial employee attitudes (job satisfaction and organizational commitment) and organizational performance.

1. The general results of the analysis between managerial employee attitudes and organizational performance support the concept that the two are definitely related.

The discussion in the literature of the direction of influence (i.e., does attitude "cause" performance or vice versa), indicates that attitudes and performance may influence each other. This discourages statements regarding the direction of the causal linkage.

Associational analysis makes one point clear: greater degrees of managerial satisfaction and commitment are associated with increased levels of organizational performance. This has profound implications for transit managers regarding the attention given to employee attitudes. Concern for efficiency and/or effectiveness, when combined with a concern

for employee attitudes, would seem to produce an optimal strategy for improving overall organizational performance.

FUTURE RESEARCH

Although several key issues were examined in this research, other important areas of organizational research remain to be examined in reference to the transit industry. This research further adds to our understanding of the functioning of transit organizations.

It is apparent that there is no single structural dimension or operational feature that will determine the best or most appropriate design of transit organizations. Success is contingent on the inter-relationship of several variables. Further investigation of the inter-relationships of structural dimensions and the implications of multiple designs in individual organizations should be considered. The suggestion that transit organizations might perform better when they allow several internal structures or "environments" introduces questions concerning communications, levels of association, and cooperative strategies. These questions should be formulated so as to analyze the consequences of these coexisting internal systems.

Another important area of research stems from a recognition that people respond differently to structural dimensions and operational features. What is good for one person is frustrating and debilitating to another. Further research would be useful to analyze the behavioral responses of individuals to size, formalization, authority, control, and

other structurally related phenomena within transit organizations. Such research could lead to improved placement of managerial personnel.

Longitudinal (long-range) examinations of the process of organizational growth and subsequent change in transit would be useful. Examination of such change processes in many transit organizations might very well indicate specific functional as well as dysfunctional activities, strategies, and behaviors which would lead to the formulation of specific recommendations regarding growth and change in transit organizations.

Finally, and perhaps most importantly, research needs to be done concerning the impact of increased involvement with, and responsibility to, governmental funding and regulatory agencies. It became apparent in the site visits that the increasing level of relationships between transit organizations and external agencies is having profound effects on management structures, management responsibilities, and management strategies in transit. Almost every facet of transit organizational functioning is affected by this expanding relationship. It appears that during the next few years, this involvement with external agencies will increase at an growing rate. Transit managers will be developing coping strategies to adjust to the increasing state and federal regulations. This will alter organizational structure in ways which may or may not be beneficial to performance. Research could provide information regarding the costs of maintaining various levels of relationships between transit organizations and external organizations. The effects of such associations on the functions of the transit manager as well as the overall performance of the transit organization should be studied.

APPENDICES

APPENDIX I
ORGANIZATIONAL STRUCTURE DEFINITIONS

Size

Size is the scale of operations of a social system. In an organization, for example, the scale of operations is indicated by such observables as the number of personnel.

The organizational literature generally defines size in terms of the number of personnel. In the present study, an additional indicator of scale of operations, namely, the number of buses operated by a property, will be used in addition to the number of personnel indicator.

Span of Control

Span of control refers to the number of members managed by the average administrator. The terms "superiors" and "subordinates"--or some close equivalents--are typically used to define span of control. This concept has been variously operationalized as the number of direct subordinates, total number of hierarchical subordinates, or total number of members divided by the total number of supervisory personnel.

Number of Specialities

The number of specialties is defined as the number of different occupational titles or different functional activities pursued within an organization.

Vertical Span

Vertical span is meant to mean organizational height. This refers to the number of organizational levels or, more exactly, the number of hierarchical levels in an organization.

Administrative Intensity

The ratio of Administrative Personnel (managerial and supporting staff) to total personnel.

Formalization

Formalization is the degree to which the norms of a social system are explicit. The terms used to define formalization sometimes refer to the use of written norms. An organization, according to this set of norms, which compiles its norms in written form is more formalized than one which does not. This concept is usually measured by ratings of the degree to which appropriate behavior is prescribed in writing, or an actual count of the number of rules existing in similar organizations.

Centralization

Centralization is the degree to which power is concentrated in a social system. In an organization, the maximum degree of centralization would exist if all the power were exercised by a single individual; conversely, the minimum degree of centralization would exist if all of the power was exercised equally by all the members of an organization.

Standardization

Standardization refers to the degree to which member behavior is prescribed or otherwise limited, either formally or informally. Standardization of procedures is a basic aspect of organizational structure, and in Weber's terms, would distinguish bureaucratic and traditional organizations from charismatic ones. The operational problems here revolve around defining a procedure and specifying which procedures in an organization are to be investigated. A procedure is taken to be an event that has regularity of occurrence and is legitimized by the organization. There are rules or definitions that purport to cover all circumstances and that appear invariably. A score is usually obtained by a count of the number of such procedures available to an organization from those in a given list (operations specific). No assumption is made as to the use of procedures.

Coordination

Coordination is the degree to which each of the various interdependent parts of a social system operates according to the requirements of the other parts and of the total system.

APPENDIX II
TRANSIT STRUCTURE SURVEY

Each manager who participated in the study completed the Transit Structure Survey. The research staff personally distributed the surveys to the individual managers and brief explanations and additional instructions were given to the managers concerning the procedures for completing the survey.

Numbers to the left of each item were used to indicate card and column number for computer coding purposes.

Scores for each of the measures are determined by summing all items in each measure. For example, if the sum of items 1:34 through 1:45 (Measure of Standardization) was 12 (indicating that an individual had scored a 1 on each item), this would be interpreted to mean that the individual did not perceive certain organizational activities as being governed by rules and regulations, thus his/her "Standardization Score" would be considered low.

The following statements appeared on the front page of the Transit Structure Survey:

This questionnaire is being used to obtain information about Transit Organization Structure and Management Attitudes. It is essential that each set of questions be answered frankly and honestly. As this is not a test, there are not "right" and "wrong" answers. Your responses will not be used in any way to judge your performance.

Your participation in this study is voluntary. We do however, value your participation.

Your answers are completely confidential. No one in your organization or any transit organization will have access to any individual's answers. Only statistical summaries for groups will be reported. After the information has been transferred to computer cards, it will be destroyed.

To ensure your privacy, please do not put your name on this questionnaire.

Thank you for your cooperation.

THE INSTITUTE OF TRANSPORTATION STUDIES

MEASURE OF STANDARDIZATION

There are many ways managers of organizations go about making sure that things are going well in the various departments of their organizations. Here is a list of the different approaches managers may take. Please rate them on the basis of the extent to which the use of these approaches is governed by rules and regulations in your department by circling the appropriate number. If the activity is not applicable to your department circle N/A.

ACTIVITY	EXTENT TO WHICH ACTIVITY IS GOVERNED BY RULES AND REGULATIONS								
	Not At All		To A Moderate Extent			To A Very Great Extent			
	1	2	3	4	5	6	7	N/A	
1:34 Meeting of all department personnel (excluding secretaries)	1	2	3	4	5	6	7	N/A	
1:35 Progress reports by department heads to their superiors	1	2	3	4	5	6	7	N/A	
1:36 Meeting between department heads and their superiors	1	2	3	4	5	6	7	N/A	
1:37 Accounting of expenditures within the department	1	2	3	4	5	6	7	N/A	
1:38 Projecting expenditures for future projects <u>within the department</u>	1	2	3	4	5	6	7	N/A	
1:39 Evaluation of department personnel	1	2	3	4	5	6	7	N/A	
1:40 Taking inventories	1	2	3	4	5	6	7	N/A	
1:41 Quality control	1	2	3	4	5	6	7	N/A	
1:42 Determination whether department is "on schedule" for work that has to be done.	1	2	3	4	5	6	7	N/A	
1:43 Preparation of agenda for meetings	1	2	3	4	5	6	7	N/A	
1:44 Correspondence with external agencies (city governments, customers)	1	2	3	4	5	6	7	N/A	
1:45 Grievance procedures	1	2	3	4	5	6	7	N/A	

FORMALIZATION MEASURE

The following are a series of statements that may or may not be true about the job you have. For each item circle the number of the response that most accurately describes your job situation.

	Defi- nitely TRUE	More TRUE Than FALSE	More FALSE Than TRUE	Defi- nitely FALSE
1:46 I feel that I am my own boss in most matters.	1	2	3	4
1:47 A person can make his own decisions here without checking with anybody else.	1	2	3	4
1:48 How things are done around here is left pretty much up to the person doing the work.	1	2	3	4
1:49 People here are allowed to do almost as they please.	1	2	3	4
1:50 Most people here make their own rules on the job.	1	2	3	4
1:51 The employees are constantly being checked for rule violations.	1	2	3	4
1:52 People here feel as though they are constantly being watched to see that they obey all the rules.	1	2	3	4
1:53 There are no rule manuals.	1	2	3	4
1:54 There is a complete written job description for my job.	1	2	3	4
1:55 Whatever situation arises, we have procedures to follow in dealing with it.	1	2	3	4
1:56 Everyone has a specific job to do.	1	2	3	4
1:57 Going through the proper channels is constantly stressed.	1	2	3	4

FORMALIZATION, MEASURE - (continued)

		Defi- nitely TRUE	More TRUE Than FALSE	More FALSE Than TRUE	Defi- nitely FALSE
1:58	The organization keeps a written record of everyone's job performance.	1	2	3	4
1:59	We are to follow strict operating procedures at all times.	1	2	3	4
1:60	Whenever we have a problem, we are supposed to go to the same person for an answer.	1	2	3	4

MEASURE OF CENTRALIZATION

Here is a list of types of problems or decisions that occur in most organizations. Please indicate the level of the organization that you feel has the primary responsibility for making each decision by circling the number of that level.

	GENERAL MANAGER	STAFF DIRECTOR	FUNCTIONS MANAGER	LINE SUPERVISOR
1:61 How most managers do their work.	1	2	3	4
1:62 How most line personnel do their work.	1	2	3	4
1:63 Scheduling of work activity.	1	2	3	4
1:64 Hiring people.	1	2	3	4
1:65 Pay raises.	1	2	3	4
1:66 Changing how managers do their work.	1	2	3	4
1:67 Changing how line personnel do their work.	1	2	3	4
1:68 What to do when something unexpected happens.	1	2	3	4
1:69 How to settle disagreements.	1	2	3	4
1:70 Firing people.	1	2	3	4
1:71 What should be done when someone is not doing his/her job.	1	2	3	4
1:72 Promoting people.	1	2	3	4
1:73 How work related problems are solved.	1	2	3	4
1:74 How work will be divided up.	1	2	3	4
1:75 What should be done when people do not get what they need to do their jobs.	1	2	3	4

MEASURE OF CENTRALIZATION - (continued)

	GENERAL MANAGER	STAFF DIRECTOR	FUNCTIONS MANAGER	LINE SUPERVISOR
1:76 What managers to day to day.	1	2	3	4
1:77 When people take time off.	1	2	3	4
1:78 How evaluation for promotion will be done.	1	2	3	4
1:79 Evaluation for promotion.	1	2	3	4

MINNESOTA SATISFACTION QUESTIONNAIRE

The next questions ask you about you and your job. When answering, keep in mind the kind of work you do and the experiences you have working here. Following the direction given at the beginning of each set of questions.

THE FOLLOWING STATEMENTS ARE ABOUT YOUR PRESENT JOB. READ EACH STATEMENT CAREFULLY AND DECIDE HOW SATISFIED YOU ARE ABOUT THE ASPECT OF YOUR JOB DESCRIBED BY THE STATEMENT. KEEP THE STATEMENT IN MIND WHEN DECIDING HOW SATISFIED YOU FEEL ABOUT THAT ASPECT OF YOUR JOB. PLEASE ANSWER EVERY ITEM TO GIVE A TRUE PICTURE OF YOUR FEELINGS ABOUT YOUR PRESENT JOB.

	<i>Very Dissatisfied</i>	<i>Dissatisfied</i>	<i>Slightly Dissatisfied</i>	<i>Neither Satisfied nor Dissatisfied</i>	<i>Slightly Satisfied</i>	<i>Satisfied</i>	<i>Very Satisfied</i>
	1	2	3	4	5	6	7
2:10 Being able to keep busy all the time.							
2:11 The chance to work along on the job.							
2:12 The chance to do different things from time to time.							
2:13 The chance to be "somebody" in the community.							
2:14 The way the boss handles his/her employees.							
2:15 The competence of my supervisor in making decisions.							
2:16 Being able to do things that don't go against my conscience.							
2:17 The way my job provides for steady employment.							
2:18 The chance to do things for other people.							

MINNESOTA SATISFACTION QUESTIONNAIRE - (continued)

HOW SATISFIED DO YOU FEEL ABOUT THE FOLLOWING ASPECTS OF YOUR JOB?

		<i>Very Dissatisfied</i>	<i>Dissatisfied</i>	<i>Slightly Dissatisfied</i>	<i>Neither Satisfied nor Dissatisfied</i>	<i>Slightly Satisfied</i>	<i>Very Satisfied</i>	
		1	2	3	4	5	6	7
2:19	The chance to tell people what to do.	1	2	3	4	5	6	7
2:20	The chance to do something that makes use of my abilities	1	2	3	4	5	6	7
2:21	The way organization policies are put into practice.	1	2	3	4	5	6	7
2:22	My pay and the amount of work I do.	1	2	3	4	5	6	7
2:23	The chance for advancement on this job.	1	2	3	4	5	6	7
2:24	The freedom to use my own judgment.	1	2	3	4	5	6	7
2:25	The chance to try my own methods of doing that job.	1	2	3	4	5	6	7
2:26	The working conditions.	1	2	3	4	5	6	7
2:27	The way my co-workers get along with each other.	1	2	3	4	5	6	7
2:28	The praise I get for doing a good job.	1	2	3	4	5	6	7
2:29	The feeling of accomplishment I get from the job.	1	2	3	4	5	6	7

ORGANIZATIONAL COMMITMENT MEASURE

THE FOLLOWING STATEMENTS INDICATE FEELINGS YOU MAY (OR MAY NOT) HAVE TOWARD THE ORGANIZATION YOU WORK FOR. HOW MUCH DO YOU AGREE OR DISAGREE WITH EACH STATEMENT?

	<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Slightly Disagree</i>	<i>Neither Agree nor Disagree</i>	<i>Slightly Agree</i>	<i>Agree</i>	<i>Strongly Agree</i>
	1	2	3	4	5	6	7
2:30 I am willing to put in a great deal of effort beyond that normally expected in order to help this organization to be successful.	1	2	3	4	5	6	7
2:31 I talk up this organization to my friends as a great organization to work for.	1	2	3	4	5	6	7
2:32 I feel very little loyalty to this organization.	1	2	3	4	5	6	7
2:33 I would accept almost any type of job assignment in order to keep working for this organization.	1	2	3	4	5	6	7
2:34 I find that my values and the organization's values are very similar.	1	2	3	4	5	6	7
2:35 I am proud to tell others that I am part of this organization.	1	2	3	4	5	6	7
2:36 I could just as well be working for a different organization as long as the type of work was similar.	1	2	3	4	5	6	7
2:37 This organization really inspires the very best in me in the way of job performance.	1	2	3	4	5	6	7
2:38 It would take very little change in my present circumstances to cause me to leave this organization.	1	2	3	4	5	6	7

ORGANIZATIONAL COMMITMENT MEASURE - (continued)

HOW MUCH DO YOU AGREE OR DISAGREE
WITH EACH STATEMENT?

		<i>Strongly Disagree</i>	<i>Disagree</i>	<i>Slightly Disagree</i>	<i>Neither Agree nor Disagree</i>	<i>Slightly Agree</i>	<i>Strongly Agree</i>	
		1	2	3	4	5	6	7
2:39	I am extremely glad I chose this organization to work for over others I was considering at the time I joined.	1	2	3	4	5	6	7
2:40	There's not much to be gained by sticking with this organization indefinitely.	1	2	3	4	5	6	7
2:41	Often, I find it difficult to agree with this organization's policies on important matters relating to its employees.	1	2	3	4	5	6	7
2:42	I really care about the fate of this organization.	1	2	3	4	5	6	7
2:43	For me, this is the best of all organizations for which to work.	1	2	3	4	5	6	7
2:44	Deciding to work for this organization was a definite mistake on my part.	1	2	3	4	5	6	7

APPENDIX III

INTERVIEW SCHEDULE ITEMS

The following items were used in a semi-structured interview with the General Manager of each transit property. Space was provided on the interview schedule itself for recording answers to the questions. In most cases, two researchers were present at the interview as a check on reliability. Time spent on the interview ranged from 1 1/2 to 3 hours depending on the time made available by the General Manager.

1. Organization Chart
 - a. Check accuracy (revise if necessary)
 - b. Relationship of chart to "real" structure
 - c. Discuss uses of chart (e.g., is it part of budget presentation?)
2. History of Organization
 - a. How current structure evolved.
 - b. Significant historical events.
 - c. Influence of outside agencies (political, regulatory)
3. Importance of Organization Structure
 - a. To the authority system.
 - b. To communication patterns.
 - c. To the operation and effectiveness of the organization.
4. Outstanding positive or negative experiences with structural variables or relations.
 - a. Experiences that affect the structure.
 - b. Experiences where structure affected something else.
5. Constraints on Structure (variations)
 - a. Internal (Chartering, Instruments, etc.)
 - b. External (State, federal, as well as local influences).
6. Goal Related Activities
 - a. Perceptions of "goal-defining" bodies organization interests (groups, individuals, or organizations "external" to organization that impact on operations).
 - b. How does organization "deal" with these bodies? Characterize relationships--formal/informal, friendly/unfriendly. Someone appointed specifically to interact with bodies?
 - c. Problems working with these bodies.

7. Goal-Setting

- a. Are these formal goal-setting activities in organization? (Overall organizational goals, subunit goals, personal goals).
- b. How are goals operationalized? How are they modified?
- c. How are goal-oriented activities/behaviors evaluated?

8. Goal Summary

- a. What should be the goals of a transit property?
- b. What are the goals of your property?
- c. What structural or environmental factors affect your organization's ability to meet your goals?
- d. If changes were possible, what would you do to create a more "ideal" organization?

9. Existence of Management Audit

- a. What was it done?
- b. Who originates it?
- c. What were results (especially structurally)?
- d. Is there an internal auditing function? (To whom does it report?)

10. What types of training programs are conducted by the organization?

11. Managerial Assessment of Grievances.

- a. What responses does management make to grievances?
- b. Are grievances analyzed as indicators of potential management problem areas?

12. Value of Comparative Information on Transit Organizations

- a. How difficult is it to generalize from one transit organization to another (even if similar in size) - why?
- b. What are some of the important deficiencies among transit organizations?
- c. What types of information would be useful (in comparative sense)?

13. Perception of Board's Role in the Activities of the Organization

- a. How involved is the board in operation matters?
- b. What role does it play in initiating or planning new activities?
- c. What role does it play in the creation of innovative activities?

CODING OF INTERVIEW DATA

1. Use of org. chart
 - 1-none
 - 2-budget
 - 3-more
2. Service area
 - 1-single city
 - 2-city and county
 - 3-multiple cities
 - 4-multiple cities & county
3. Board selection
 - 1-city dept.
 - 2-elected
 - 3-appointed
 - 4-elected and appointed
4. Number of board members
5. Use of committees on the board
 - 1-none
 - 2-little
 - 3-extensive
6. Board involvement in operations
 - 1-none
 - 2-low
 - 3-medium
 - 4-high
7. Goal Setting Activity
 - 1-none
 - 2-small amount
 - 3-moderate amount
 - 4-large amount, including evaluation
8. Goal setting type
likert scale: 1-efficiency, 4-mixed, 7-effectiveness
9. Audit
 - 1-yes
 - 2-no
10. Training activity
 - 1-none
 - 2-drivers/mechanics
 - 3-managerial

APPENDIX IV

ARCHIVAL RECORDS

1. Organization Size

- a. Total number of operating vehicles.
- b. Types of vehicles (and number) articulated, large bus, small bus, van.
- c. Amount of service contracted out, type contracted out.
- d. Relationship with contractors.
- e. Vehicles on fixed-route service.
- f. Special services provided (differentiate those contracted out).
- g. Kinds of services provided and number of vehicles and employees in each.
- h. Total number of employees on payroll (excluding part time).
- i. Budget: Capital/Operating Expenditures.

2. Subunit Size

- a. Total number of subunits in organization.
- b. Names of department and numbers of personnel in each
- c. Organization chart, how current is it, frequency of changes.

3. Number of Specialties

- a. Number of functional job titles.
- b. Job classification scheme.
- c. Level at which employees are no longer covered by the job classification.
- d. Number of contract employees.

4. Vertical Span

Total number of hierarchical levels in the organization.

5. Administrative Intensity

- a. Total number of managers over total number of employees.
- b. Administrative employees and operating employees (number - ratio).
- c. Managers to operating employees.
- d. Nonmanagerial administrative employees to operating employees.

6. Other Information

Turnover data for the last three years (also record the number of employees in given year)

Managerial
Operating
Administrative

7. Formalization Checklist

Get copies of these documents if possible (if not, check if available)

1. Written contract of employment.
2. Information booklets (which employees get the booklets)
3. Organization chart (how much of organization is included, who gets copies)
4. Written instructions available to operating employees
5. Written terms of reference or job descriptions for supervisors
6. Written job descriptions for staff
7. Written job descriptions for general manager
8. Written job descriptions for managers
9. Written statement of policies
10. Written workflow schedule
11. Written research planning program and/or research on planning reports
12. New employee orientation material.

8. Other

CODING OF ARCHIVAL DATA

1. Organization Identification
2. Card Number
3. Organization Size
 - Total Buses
 - Vans
 - Small Buses
 - Regular Buses
 - Large Buses (articulated)
 - Proportion of fixed routes

 - Contract Services
 - 0=none, 1=some, 2=lots

 - Total people
 - Managers
 - Maintenance
 - Operations
 - Administration
4. Administrative Intensity
 - Admin. component/operating component
 - Mgrl. component/operating component (ops+maint)
5. Vertical Span
6. Formalization
7. Turnover (percent)
 - Managerial
 - Operations
 - Administration
8. Budget (thousands)
 - Operating
 - Capital
 - Total
9. Subunits
 - # of major divisions
 - # of subunits
10. Number of specialities

APPENDIX V
DEMOGRAPHIC DATA

These questions appeared at the beginning of the Transit Structure Survey:

- | | | | |
|---------|--|---------|---|
| 1:10 | Are you -
1. Female
2. Male | 1:16 | What <u>formal management education</u> have you had in the area of management?
1. None
2. Professional Certificate
3. Undergraduate courses
4. Bachelors Degree
5. Some Graduate Degree
6. Graduate Degree |
| 1:11-12 | How old were you on your last birthday? | | |
| 1:13 | Are you married?
1. No
2. Yes | | |
| 1:14 | What is your education level? (Indicate highest grade completed)
1. Some elementary school (grades 1-7)
2. Completed elementary school (8 grades)
3. Some high school (9-11 years)
4. Graduated from high school or G.E.D.
5. Some college or technical training beyond high school
6. Graduated from college (Bachelors degree)
7. Some graduate school
8. Graduate degree (Masters, Ph.D., etc.) | 1:17-18 | How many <u>years of experience</u> do you have in <u>management</u> ?

In present organization? |
| | | 1:18-19 | In previous transit organizations? |
| | | 1:20-21 | In other types of organizations? |
| | | 1:22-23 | Has the organization which you work for at the present time provided any type of <u>training</u> in transit management?
1. No
2. Yes |
| | | 1:24-25 | How long have you been employed by your present organization?

In a non-management position? |
| 1:15 | Are you -
1. Black
2. Asian
3. American Indian
4. Spanish surnames
5. White
6. None of the above | 1:26-27 | In a management position? |
| | | 1:28 | What is your current job title? |
| | | 1:29-30 | How many employees in your organization report <u>directly</u> to you? |
| | | 1:31-32 | How many subordinates are under your supervision? |

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