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Report HSRI-002330-3

## Consultative Support to:

# THE SAFETY DEMONSTRATION PROGRAM FOR OAKLAND COUNTY, MICHIGAN

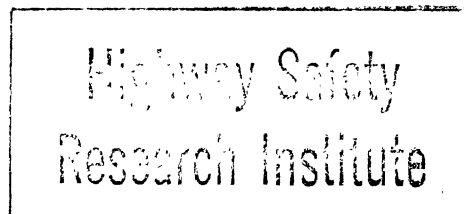
Task 4: Final Management System Recommendations

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FINAL REPORT



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for:

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## PREFACE

This report is the last of a set of three prepared by HSRI which summarize the observations, conclusions and recommendations of the HSRI staff relative to the management system development aspects of the "Safety Demonstration Program for Oakland County, Michigan." That demonstration program, scheduled for the period 19 June 1970 - 24 June 1972, was sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract FH-11-7542 with the Oakland County Board of Commissioners. The Traffic Improvement Association of Oakland County (TIA) was selected by the Commissioners as the action agency for the program. The HSRI consultant sub-contract involvement with TIA was for the period 1 August 1970 - 15 November 1971.

While compiled by HSRI, this report also reflects the efforts and thoughts of the TIA Demonstration Program Staff, specifically Messrs. Bruce B. Madsen, Stuart R. Perkins, and Camille Banciu, and of the dozens of traffic safety practitioners who participated in special Task Forces. Acknowledgment is also due to the Executive Committee of the Interim Traffic Safety Management System for their advice, assistance, and direction. While membership of that Committee varied, it consisted at the conclusion of the HSRI participation of Messrs. Niles E. Olson (Chairman), William Hanger, Paul A. Heber, Richard E. Kimball, Bruce B. Madsen, Daniel T. Murphy, and Estol L. Swem.

However, the responsibility for the contents of this report rests with the HSRI authors. Thus the opinions and conclusions do not necessarily reflect those of TIA, the Oakland County Board of Commissioners, or NHTSA.

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## 1.0 INTRODUCTION

The principal intended thrust of the Oakland County Safety Demonstration Program was expressed in the prime contract as follows: "The contractor [Oakland County Board of Commissioners] shall design, implement, and evaluate new management systems and techniques for improved efficiency and effectiveness of local highway safety programs." That thrust presumably was derived from the following considerations:

- Scarce resources available for highway safety programs will provide greatest impact when applied to modern countermeasure programs which respond to identified priority areas.
- Highway crashes are of complex and multiple causation, requiring aggressive treatment by mixes of disciplines, functional operations, agencies, jurisdictions, etc., and thus require comprehensive, integrated and coordinated planning and implementation.
- Modern management system concepts applied locally in highway safety planning will promote more accurate definition of the problems and associated reaction priorities, more prudent allocation of limited resources, and more effective and integrated multi-jurisdictional execution of countermeasure programs.

Those considerations formed the basis for the consulting arrangement between the Highway Safety Research Institute (HSRI) and the Traffic Improvement Association of Oakland County (TIA), the formally identified action agency for the County's conduct of the demonstration program. The HSRI responsibility was generally that of supporting TIA by injecting appropriate elements of traffic safety state-of-the-art, of management sciences principles, and of experiences of other jurisdictions in traffic safety management in the evolutionary development

of an improved traffic safety management system for Oakland County.

The management system considerations and recommendations that form the body of this report were evolved over a fifteen-month period during which several exploratory system development tasks were conducted. Thus, a brief synopsis of those development tasks is necessary here to provide foundation and context to the management system conclusions presented in later sections.

The initial task of that system development effort involved the design and implementation of an interim management system. The recommended characteristics of that interim system, intended both to provide direction for the demonstration program and to serve as the development seed for the final system, were presented in an HSRI interim report.\* A key feature of that interim system was the Executive Committee, composed of representatives from County government, local government, and the private sector and intended to provide policy guidelines for program operation and system development. One of the early decisions of that Executive Committee is reflected in the final system recommendations presented in this report. That decision specified that the final management system recommendations must address evolutionary improvement of the current and historical Oakland County system, i.e., a high-coordination, low-control management system with TIA as the central element, but with broad participation, direction, and support by the public and private sectors of the county. The system design task thus reduced to identifying strengths and weaknesses of the existing operation and of devising recommendations for incremental improvement of that operation. The recommendations presented in this report reflect that Executive Committee directive.

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\*Munson, M. J., et al. "Task 1: Interim Management System Development", Interim Report No. HSRI-002330-1, November 23, 1970.

The second task of the system development effort involved the design and testing of techniques for periodic assessment of the County traffic safety situation. These tools for management use included mass traffic accident data analysis, practitioner surveys, and practitioner task forces, all intended for integrated use in precise identification of County traffic safety problems and their relative severities. How those problem identification tools fit in the recommended final management system configuration is discussed in later sections of this report. Details on their development and testing were given in a second HSRI interim report.\*

The follow-up task to the problem identification methods task involved the design and testing of procedures for developing countermeasure projects and programs commensurate with identified safety problems. That task, mainly conducted by TIA, involved use of practitioner task forces for general identification of program needs, technical planning by TIA staff, and follow-up review by the same practitioner task forces. The successful features of that program development effort are also reflected in the recommendations presented here.

That then is the foundation of the system recommendations presented here. Section 2.0 that follows presents the required functional characteristics of a generalized traffic safety management model. In Section 3.0, the current county operation is compared with that idealized model to identify needed changes in the county operation. Finally, Section 4.0 contains the action plan for implementing the recommended system in Oakland County.

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\*Munson, M. J. et al. "Task 2: Analysis of Highway Crash Problems and Priorities," Vols. I & II, Interim Report No. HSRI-002330-2, April 15, 1971.

## 2.0 A FUNCTIONAL MANAGEMENT MODEL

Traffic safety problems, like most social problems, are extensive in type, magnitude and complexity. Over the years a myriad of private and public agencies has emerged to provide a multitude of activities and programs in response to the complex set of traffic safety problems. Diverse responsibilities have been assigned to or assumed by the various state and local agencies, resulting in a severely fragmented set of responses and services. This fragmentation has led to a number of inefficiencies, including, with this area-wide problem, the lack of area-wide planning and management of traffic safety resources and activities. Such a multi-jurisdictional situation requires some coordinative mechanism that is effective, yet does not deprive the autonomous jurisdictions of their rightful decision-making authority. It is the basic purpose of this section to offer a model of such a mechanism which will encourage and facilitate the coordinated execution of unified planned actions by the diverse autonomous institutions. This mechanism is termed a "management system," but one which facilitates individual decisions.

The model utilizes concepts from management theory, planning theory, and organization theory, but is unique from those areas in that it aims at coordinating a large number of autonomous and independent units. The model uses the provision and exchange of information as a basis for coordinating decision-making by the various operating units.

### 2.1 OVERVIEW OF THE MANAGEMENT MODEL

The management model, which will be developed in detail below, consists of three distinct segments which form a



functional hierarchy. The first segment is called Strategic Planning and deals with general policies and objectives for the system. These policies and objectives are fed into the Management Planning segment which develops programs aimed at realizing the objectives. Finally, the Operational Control segment deals with performing the various projects included in the programs. This is shown schematically in Figure 1.

Building on this simple linear system, the Management Model developed here becomes unique in that the Operational Control segment consists of autonomous and independent units (political jurisdictions and agencies). Thus, authority relationships usually inherent in management concepts are not applicable. Instead of the traditional authority-based management system, the intention here is to develop such a system based on the use and exchange of information. Information in its simplest form is knowledge of some state or phenomenon. The planning aspect of information converts it to "What state will exist if something is, or is not, done." The relationships between the three segments will be composed of channels and flows of information.

Each of the three functional segments requires informational inputs. The Strategic Planning segment requires information on whatever phenomenon it is trying to deal with (the environment - e.g., the traffic crash situation) in order to establish and evaluate policies and objectives. The Management Planning segment requires information on how the environment will change (has changed) when subjected to various programs. The Operational Control segment requires information on direct project actions on the environment. Figure 2 depicts the Management System as three overlapping information loops, while retaining the linear inter-relationships between segments.

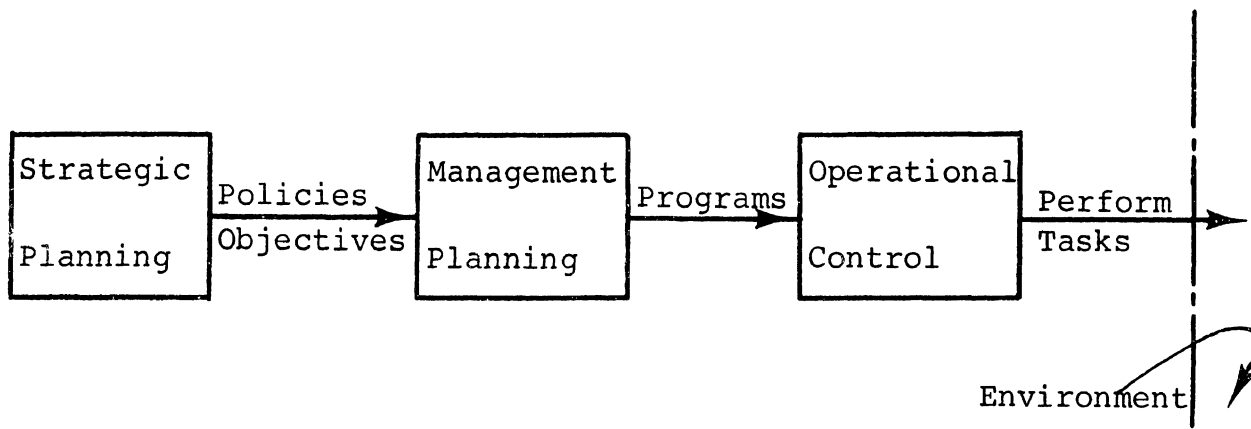


FIGURE 1. MANAGEMENT SYSTEM SEGMENTS

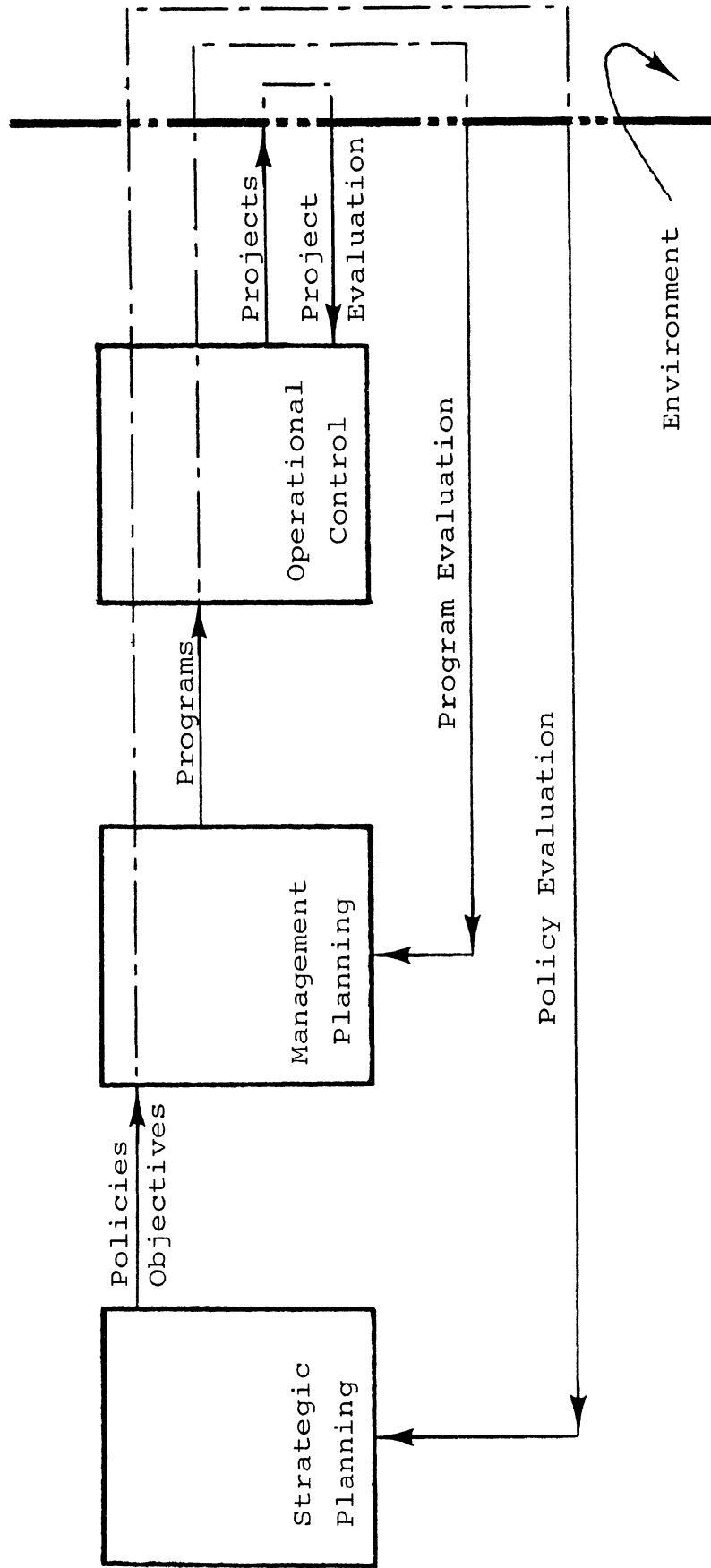


FIGURE 2. MANAGEMENT SYSTEM INFORMATION LOOPS

## 2.2 ASSUMPTIONS UNDERLYING THE MODEL

The above is a brief overview of the multi-jurisdictional Management Model. The details of each functional segment and the interface between segments will be presented later. First it is necessary to examine the basic assumptions behind such a Management Model.

It is first assumed that actual delivery services provided by the system will be performed primarily by a multitude of autonomous operating units (political jurisdiction, public agencies, private organizations, etc.). The management system addressed here will deal with the coordination of these units, not with the actual delivery. Thus, primary concern will be with the Strategic Planning and Management Planning segments, and will deal with area-wide planning activities.

Second, it is assumed that there is no legal basis for coordinating the actions of the autonomous units. Society has granted home rule autonomy to cities, and in addition has legitimized the independent rights of local units of government. This autonomy is not to be sacrificed easily. As a result, however, any attempt at handling problems on a regional or area-wide basis must look to something other than legal sanctions for its driving force. Another means must be developed for motivating cooperative behavior.

The third assumption deals with the behavioral patterns of the individual operating units. It is assumed that each operating unit will make its decision to participate in cooperative activities based on the perceived cost of participation and the perceived benefits of participation. This corresponds to the "inducement-contribution" concept of organization theory.\* An operating unit cannot be expected to participate unless the inducements offered are

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\*This concept is described in Simon, H. and March, J., Organizations, Wiley: New York, 1964, p. 84.

at least equal to the contributions required, and at least equal to inducements offered by competing activities, or by non-participation.

Applying this concept to the various operating units, several factors emerge which must be dealt with by the management system. While the management system is dealing with a series of autonomous organizations, it is also dealing with the individuals who make the decisions for each of these organizations. Thus, inducements can be directed to either (or both) the individual and the organization. Organization or individual directed inducements alone may not be sufficient to induce participation, but combinations, varying with each case, may be successful. Note that this is not intended to demean the individuals involved by playing up their self-interest. On the contrary, individual directed inducements may have to be more public service oriented than those directed to organizations in order to satisfy personal social goals. Organizations may be satisfied with simple economic inducements.

It must also be recognized that these individuals and organizations are going to have limited resources with which to participate. Any expectations which the management system may have regarding participation must fall within these resource limitations.

Similarly, the management system must recognize that each operating unit will be subject to competing pressures for its limited resources. Thus, successful inducements offered by the management system must be perceived by the operating units (or key individuals thereof) as being greater than those offered by competing activities and as being tied directly to the participatory behavior, as well as being greater than the contribution required.

Finally, it must be recognized that the possible inducements offered by the management system are not unlimited. Obviously, the resources available to the management system are scarce. Within the limits of availability, the management system can provide such things as general information gathering, data processing, technical advice and assistance, and even such intangibles as political or personal prestige. While the management system may assist operating units in obtaining outside funds to implement various projects, the system itself generally cannot dispense direct financial support.

The fourth major assumption on which the management model relies is that coordinated actions of any kind depend on effective communications. It is difficult to conceive of coordinated actions between two or more units if each one does not know what the others are doing. This communication may occur between the management system and the various individual units, or among the operating units themselves. It is this communication requirement which underlies the reliance on information flows to define the relationships between the functional segments of the management model. When designing a communication-based system, the following four components of communication must be considered: 1) the sender, 2) the receiver, 3) the message, and 4) the media of transmittal. While each of these components may vary depending on the purpose and situation, long term coordination activities might dictate the establishment of some relatively permanent communications links.

The final basic assumption of the proposed management system deals with a theoretical continuum of the coordinative role which the management system might play. On one end of this continuum is the relatively passive role of general information dispersal. The management system simply accumulates and sends out all available information to all

units. The assumption is that if the various units had better information on what can be done and what neighboring units are doing, they will tend to make coordinated decisions. In this role the management system would conduct studies, develop proposals, and transmit the information, leaving implementation entirely to the discretion of the local units. Basically, this mode of operation is aimed primarily at enhancing the ongoing activities of each of the various units.

At the other end of the continuum is a more active but selective information dispersal role. Information dispersal would be directed to those operating units which are pertinent to a specific program. The first step, of course, must be to generate an interest in cooperation and willingness to cooperate. The assumption here is that more than just information is necessary to achieve coordinative action--that intense interaction and negotiation with the relevant units will be required, and that this effort should not be expended on non-relevant units.

The results of such purposive and active attempts at coordination can take three forms, or combinations thereof. Obviously, one result is to continue and improve current activities that are seen as valuable. A second possibility is to curtail existing activities which are seen to be of limited value or even dysfunctional. The final option is to stimulate involvement in new activities which will be instrumental in alleviating both local and area-wide problems. The management system model presented in the following pages will tend toward the latter pole of the continuum. It is felt that many previous attempts at regional planning and coordination which have failed have relied on the former, more passive approach, and have not

generated inducements sufficient to stimulate the desired participation.

### 2.3 THE MULTI-JURISDICTIONAL MODEL

Those are the assumptions on which the multi-jurisdictional management model is based. The following pages will define the general management function and develop the model in detail.

In its general form, management can be viewed as the coordination of a variety of separate activities so that the combined results move, as efficiently as possible, towards a desired objective. Given this general definition, it is possible to specify nine component tasks which are necessary to the performance of the general management function. These tasks are,

- Task A-1: To determine what the desired characteristics of the environment should be; establish objectives and priorities.
- Task B-1: To recognize when the characteristics of the environment are not, or are not expected to be, as desired.
- Task B-2: To examine the workings of the environment to determine why the desired states are not occurring, or are not expected to occur.
- Task B-3: To propose and pre-test changes in the environment which would return, or bring, the characteristics to the desired states.
- Task B-4: To determine, for solutions appearing successful in the pre-test, feasible means of implementation, including the identification of the proper implementing persons or units.
- Task B-5: To communicate to the proposed implementing persons or units the nature of the situation to be changed, the proposed activities, and the potential resources available.



- Task B-6: To monitor the activities of the implementing units to see whether the proposed activity is, in fact, carried out. If not, the failure to get the activity implemented must be considered as an undesired state of the environment.
- Task B-7: To monitor the actual changes in the environment as a result of the implemented action in order to build up a memory of how the environment responds to various activities.
- Task B-8: To continually re-assess the environment in order to revise the solutions and/or the recognized problems.

Anthony\* has developed three categories of management activities identified and defined as follows:

- Strategic Planning is the process of deciding on objectives of the organization, on changes in these objectives, on the resources used to attain these objectives, and on the policies that are to govern the acquisition, use, and disposition of these resources.
- Management Control is the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization's objectives.
- Operational Control is the process of assuring that specific tasks are carried out effectively and efficiently.

"Management Control" is something of a misnomer, since this category of management activities includes a great deal of planning activity. Thus, the term "Management Planning" is used in subsequent discussion.

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\*Anthony, R. Planning and Control Systems: A Framework for Analysis. Harvard Press: Cambridge, 1965.

By grouping the nine component tasks as defined above according to Anthony's three categories, the skeleton of a functional management model results. Figure 3 is a block diagram of such a model. Each of the three categories, and its constituent component tasks, are discussed in turn below.

2.3.1 STRATEGIC PLANNING. The primary purpose of this level of decision-making is, according to Emery, "... to provide information to lower level units that causes the organization as a whole to steer toward its global objectives."\* Further, high level decisions impose general aggregate constraints on lower level decision makers. Within these constraints, the lower level units are free to pursue their own (changing) goals more or less independently.\* This concept relies very strongly on Simon's concept of hierarchical constraints.\*\* The policies and objectives (or constraints) or upper level plans "guide" or "motivate" lower level plans to conform to the organization's global objectives.\* This parallels the first of the nine component tasks of management --

Task A-1

To determine what the desired characteristics of the environment should be--establish objectives and priorities.

In its simplest form, this deals with establishing desirable "standards" to apply when evaluating the characteristics of the controlled system. Decisions at this level deal with the general direction of the entire organization and include 1) general policies for obtaining support, 2) policies guiding operations, and 3) operational objectives and priorities for action.

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\*Emery, J. Organizational Planning and Control Systems,  
McMillan: New York, 1969.

\*\*Simon, H. "On the Concept of Organizational Goal",  
Administrative Science Quarterly, June 1964.

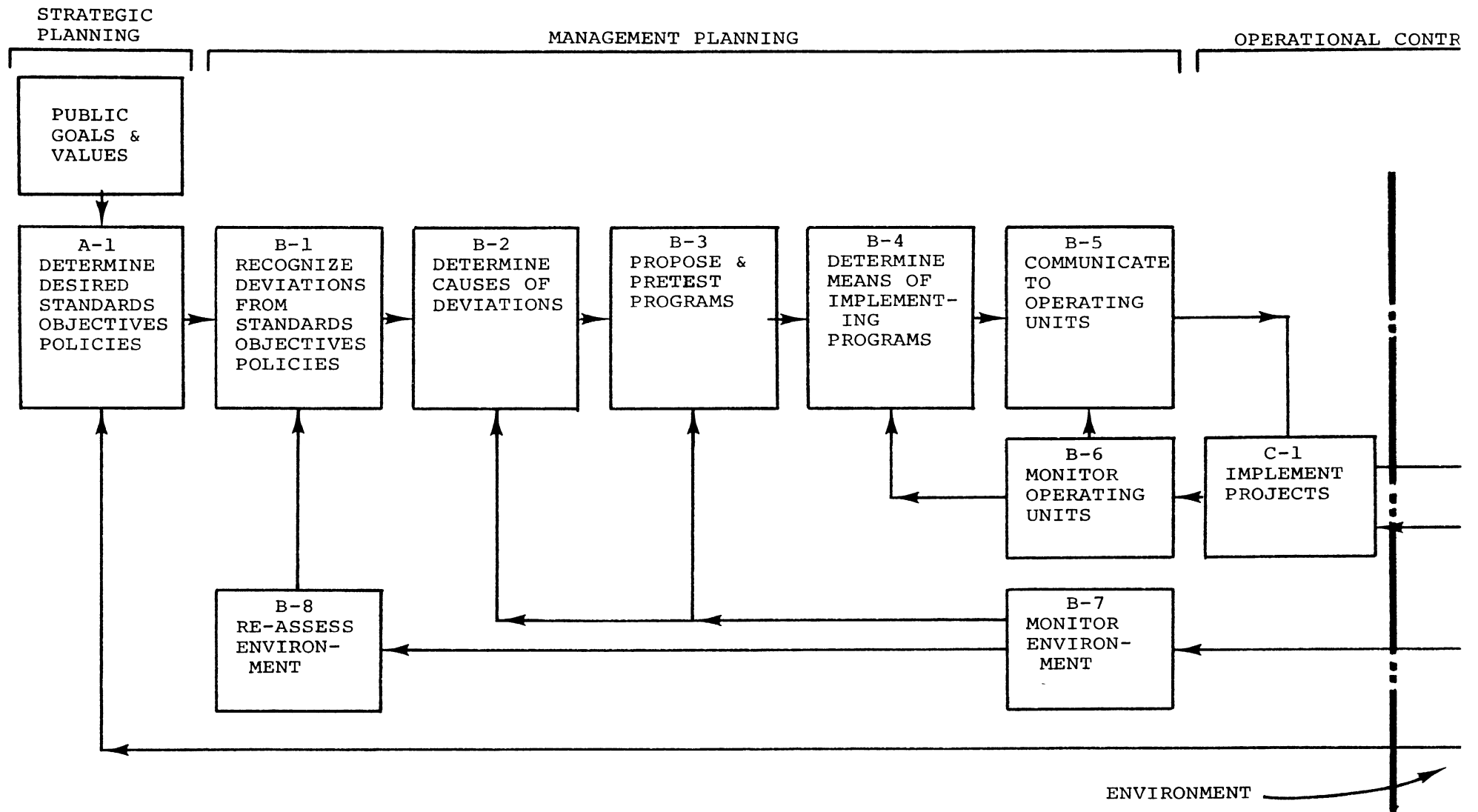


FIGURE 3. BLOCK DIAGRAM OF THE MANAGEMENT SYSTEM MODEL

Up to this point, only the purpose of this level of decision-making has been discussed. It is also necessary to describe the output in somewhat more detail. The first output mentioned above deals with the specification of policies. A policy is a rule or guideline of general application to which the activities of the organization must comply. The stipulation that the management system itself cannot perform direct operations in the field is a definitive policy. Policies can be set down to constrain not only the organizations's interface with its environment (input and output) but also its internal operations, such as the use of consultant services.

The second output of the strategic planning activity was identified as objectives for which the actions of the organization must strive. "Objective", as used here, refers to a specific, definable, measurable future state such as a ten-percent reduction in traffic fatalities, twenty-five percent increase in financial resources, etc. Such objectives must be made explicit and should be accompanied with an end date and a means of measuring success.

Ideally, the Strategic Planning Level will be an identifiable sector of the organization. It will consist of a group of individuals who, for one reason or another, have decided that they can achieve their individual goals by working together. The decisions they make, that is, policies and objectives which guide the total system, must be explicit if they are to be effective.

Two basic types of inputs are required for this level to function effectively--personal time and energy, and information. The former requires that enough people are sufficiently committed to the joint efforts to expend their time and energy making the necessary strategic planning

decisions. This of course requires that they perceive some personal benefit to be derived from such commitment.

The informational inputs come from two sources. From the environment must come information dealing with the validity of the policies and the success in meeting the objectives. The former deals with subjective perceptions of public values and goals, the latter with perceptions of the state of the environment. From the other source, the Management Planning level, must come information describing how the programs generated compare to, or strive for, the specified objectives.

The relationship between the Strategic Planning category and the Management Planning category is quite traditional. Management Planning is essentially staff activity for the Strategic Planners, and thus connected by formal authority links as well as information flows. It is expected that frequent interaction between the two groups for informal information transfer, as well as formal periodic communications, will be desired.

2.3.2 MANAGEMENT PLANNING. Activities in the Management Planning category deal primarily with the development of programs and projects which achieve the objectives specified by the Strategic Planning actions. Management Planning is concerned with what needs to be done, how it should be done, and who might best do it. Since actual delivery operations will be performed by the various operating units, the Management Planning category must also be concerned with the relationships between itself and the various operating units, as well as relationships between the operating units themselves.

This category is the most critical to the success of the total multi-jurisdictional management operation, and includes eight of the nine component tasks of the management function. Each of these will be discussed and expanded on below.

### Task B-1

To recognize when the characteristics of the environment are not, or are not expected to be, as desired.

This is a matter of identifying and specifying the problems which must be resolved. The intention is to identify those characteristics of the environment which must be changed (and the magnitude of the change) in order to achieve the objectives. If one could compare the measured characteristics of the environment with specified standards for those characteristics, one could identify specific problem areas. It is quite obvious that such comparison can only be made if data describing the actual characteristics of the environment are available in a usable form. Such data can be collected directly as a part of this component task or it can be collected by the operating units and transmitted to the management planning level.

The management system must deal not only with existing problems, but also with anticipated problems. This requires some means of projecting both standards (or objectives) and environmental characteristics into the future. This component task deals with problems in terms of their visible symptoms. The next component task attempts to determine the causes behind the symptoms.

### Task B-2

To examine the workings of the environment to determine why the desired states are not occurring.

The successful performance of this task obviously requires considerable detailed knowledge of the environment. Such a body of knowledge, organized in a systematic form, can be termed an operational model of the environment. Such an operational model must deal not only with the various characteristics of the environment, but also with cause and effect relationship between characteristics. Analysis of

these inter-relationships will indicate where changes specified in the objectives and component task B-1 above, can best be brought about via changes in other, less obvious, characteristics of the environment. The output of this component task is a further specification of the problems by specifying changes to certain characteristics of the environment which will cause the alleviation of the problem symptoms.

#### Task B-3

To propose and pretest changes in the controlled system which would return, or bring, the characteristics to the desired states.

This component task involves the exploration of possible programs which might produce the changes identified in the problem specification tasks B-1 and B-2 above. It is at this point in the planning process that the creativity necessary for innovation is injected. Beginning with the problem specification it is necessary to examine the changes to be induced and to design programs to produce such changes. Ideally, a set of potential solution programs can be developed.

Once some potential programs are generated, they must be evaluated and the best one selected for implementation. This evaluation requires that the effects of each potential program be projected into the future (via the operational model of the environment) and some evaluative criteria applied to the results. Such evaluative criteria as "cost benefit analysis", "cost effectiveness analysis", "P.P.B.", proximity to the desired outcome, etc., may be used. However, whichever criterion is selected, it must be applied uniformly to all alternatives. Finally, some minimal level should be specified, below which even the best alternative will be rejected.

The output of this component task should be a program,

or set of interrelated actions, which will produce the desired changes to the environment as efficiently and effectively as possible. This potential program is input to the next component task which explores means of implementation.

Task B-4

For solutions appearing successful in the pretest, to determine feasible means of implementation, including the identification of the proper implementing persons or units.

It is the purpose of this task to develop a hypothetical work program for the implementation of the programs designed in task B-3 above. Basically two types of information are needed for this activity. On the one hand, the program must be broken down into its project components. Each project must be accompanied by a delineation of resource needs, information needs, manpower needs, geographic needs, evaluative measures, etc. This list is then compared to a list of all relevant operating units with their individual capabilities, geographic span of control, constraints, etc.

This task is quite similar to the "programming" process in the PPB system, and in the Planning, Programming, Budgeting, Execution, and Evaluation concept put forth by Peat, Marwick, Mitchell & Co.\* The task differs from the traditional programming function in that it does not produce an ultimate action plan. Rather, it recognizes that individual projects cannot be delineated without interaction with the operating units which perform them, and thus produces only a hypothetical action plan. It is hypothetical in that it serves as a starting point for intensive interactions, aimed at joint project development, with the operating units.

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\*Peat, Marwick, Mitchell & Co. Highway Safety Program Management and Reporting System, Vol. I, System Description. Final Rept. on NHTSA FH-11-6925, Dec. 1969.



#### Task B-5

To communicate to the proposed implementing units or persons the nature of the situation to be changed, the proposed activities, and the potential resources available.

While this component task is located in the Management Planning category, it is the primary interface with the Operational Control category. The purpose of this task is to establish the necessary relationships with and between the operating units. This can be depicted as establishing the "system" to facilitate the various activities which, when performed in a coordinated fashion, will accomplish the desired end. It was previously stated that these relationships will be based primarily on channels and flows of information. Due to the flexible and changing nature of these information-based relationships, this task can be best accomplished via a continuous process of intense interactions with the operating units, a process loosely termed "negotiations." Agreements and commitments by the operating units to participate in activities suggested by the hypothetical work program are developed during these negotiations.

The Management Planning body must recognize that the various operating units may respond differently to the negotiating interactions. This is expected for two reasons. First, each individual operating unit will have its own set of goals, constraints, and priorities (often implicit) which must be recognized before an agreement can be reached. Second, the individuals between which the negotiations are taking place will have a personal set of goals, constraints and priorities. The Management Planning body must recognize these facts and attempt to develop negotiating strategies which will increase the likelihood of reaching successful agreements.

It must be expected that the set of relationships and projects emerging from the negotiations may differ considerably from those suggested in the hypothetical model. Over

time, as experience accumulates, the differences may diminish. At any rate, the negotiating process is probably the most critical of the entire management function, and could well use a great deal of experimental research.

#### Task B-6

To monitor the activities of the implementing units to see whether the proposed activity is, in fact, carried out. If not, the failure to get the activity implemented must be considered as an undesired state of the environment.

The intent here is not that of policing and penalizing the operating units which do not perform as they agreed to. Obviously the management system has neither the power nor the authority to do that. Instead, this task is intended to create a feedback loop which enables the Management Planning function to better understand the workings of the various operating units. This understanding will improve the list of characteristics, capabilities, constraints, etc., associated with each of the operating units and will thus facilitate improvement of the work plan development and negotiation strategies discussed in task B-5 above.

#### Task B-7

To monitor the actual changes in the environment as a result of the implemented action in order to build up a memory of how the environment responds to various activities.

In its simplest form this task is that of measuring progress towards the desired states of the environment. However, it must go beyond simply measuring the final effect of an action. It must also observe and record intermediate (sequential) effects leading to that final state, as well as any unexpected effects. Data required for this monitoring function must describe both the various characteristics of the environment as well as the actual actions performed. These data can be collected directly by the Management Planning body or transmitted from the Operational Control level. Actual

outcomes can then be compared to expected outcomes in order to measure progress and to facilitate the updating and refining of the operational model of the environment (see task B-2 above) which was used to pre-evaluate potential programs.

Task B-8

To continually re-assess the environment in order to revise the solutions and/or the recognized problems.

This task ensures that the management function will be an ongoing and adaptive mechanism which is capable of responding to changes in methods for inducing change in the environment. Basically, this involves periodic re-scanning of the characteristics of the environment in comparison with current objectives. If objectives are still the same, and past programs have produced progress toward them, the re-scanning will result in proposing continuation of such programs. If objectives have remained the same, and past programs have not produced progress, the re-scanning should produce either impetus for modifying the programs, or impetus for re-specifying the problem. In any case this final management planning task closes a feedback loop between objectives, actions, and results.

2.3.3 OPERATIONAL CONTROL. This is the final category of the total management function and deals with the actual implementation of the various projects. It has previously been specified that this implementation of projects will be carried out primarily by the various operating units, either individually or in combinations. It is also expected that resources for such operations will be obtained at the operating unit level. Finally, it is quite clear that only these actions at the operating unit level will directly affect the environment.

The Operational Control category can be seen as consisting of activities aimed at assuring that the projects undertaken by the operating units are executed in a manner which produces the prescribed impact on the environment, and does so as efficiently and effectively as possible. Since most projects will be continuous over some time span rather than "one shot", operational control will provide evaluation and modification of project activities. Schematically, operational control becomes a feedback loop between the operating units and the environment. This is depicted in Figure 4.

To depict this operation as a loop is simple and neat. However, the creation of such a loop depends on the generation and use of information. The operating unit must know what it is attempting to change--key measurement variables, scales, etc. This information is generated in component task B-6 of the Management Planning category, and results from interactions and negotiations between the management planning body and the operating units. Also, a complete quantitative log of what actions are performed should be compiled by the operating unit along with subjective or qualitative comments on the receptivity of the environment to the actions. Finally, data on the environment, including measures of both expected and unexpected changes, must be collected. Analysis of these data will provide the information for the evaluation and modification of projects inherent in the Operational Control function.

#### 2.4 MODEL CONCLUSIONS

The model presented in the previous section is purposely abstract. It deals with a general application of management focussing on complex problems with complex solutions. Traffic safety is certainly a problem of that type. As suggested at the beginning of this section, the complexity of traffic safety problems exceeds the scope of any single agency, and are not confined by geographic or political boundaries.

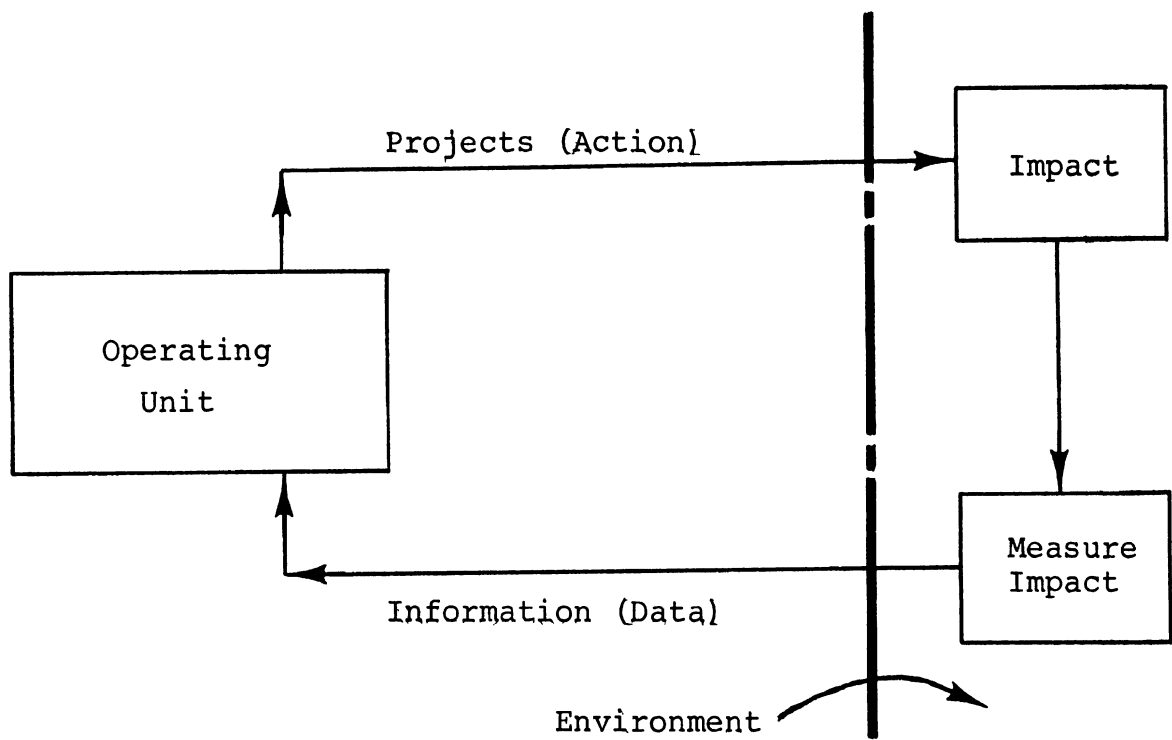


FIGURE 4. OPERATIONAL CONTROL LOOP

However, projects relating to traffic safety are performed by just such autonomous agencies within limited geographic jurisdictions.

Effective resolution of the problems requires the development of the needed mix of different agencies (such as police departments and courts), as well as coordinated actions by like agencies (such as police in two adjacent communities). No legal basis exists to generate this type of problem solving and project action. Therefore, the problems remain and the solutions put forth are piecemeal.

The information-based management model is intended for just such a situation. Its heavy emphasis on the Management Planning category, including negotiations with the various operating units, is obviously aimed at providing coordinative direction for such a variegated set of actors as exist in the traffic safety area. The next chapter recognizes the applicability of the model to the traffic safety area in general and discusses its application to the planning and coordination of traffic safety activities in Oakland County, Michigan.

### 3.0 TRAFFIC SAFETY MANAGEMENT IN OAKLAND COUNTY

In Oakland County, as in most places, traffic safety services have traditionally been provided by a large number of individual and autonomous agencies. Also typical is the fact that most of these agencies provide traffic safety services as a bi-product of their primary charge. These facts lead to the inadequacies, inconsistencies, and inefficiencies in the production of traffic safety services discussed generally in Section 2.0.

In 1965 the problems inherent in this piecemeal approach were recognized. A series of task groups composed of concerned and involved citizens, was convened to study the traffic safety problem and the, then-current, responses to it. Among the outcomes of this study was the recognition of the need for some type of county-wide coordinative mechanism. The result of this recognition was the creation of the Traffic Improvement Association of Oakland County (TIA).

Under the direction of the Executive Committee of its Board of Directors, the TIA staff has performed both a coordinative and an operational role. One of the primary coordinative activities was the development of the Traffic Data Center (TDC) to accumulate, record, store, and process data on accidents and enforcement throughout the county. From its initial purpose of providing simple data summaries, the TDC has expanded in response to needs expressed by the various police and engineering agencies which use the data. It now is capable of providing sophisticated summaries of accidents and enforcement activities classified by a variety of factors including location, time of day, alcohol involvement, etc. In addition, the TDC has instituted an intersection rating system for determining the need for improved control mechanisms and/or geometrics.

In general, TIA pursued the recommendations of the 1965 task group study, including such things as additional remedial

driver training centers and improved high school driver training programs. The procedure used was to draw together people involved in the activities and attempt to develop and implement the programs.

In addition to this catalytic role, TIA has responded programmatically to expressed needs when there were no other operating agencies. The most notable action of this type was the intensive seat belt campaign conducted in 1968-69.

Still, however, TIA felt that its coordinative actions were not as effective as they could be. To remedy this, the current demonstration project was developed to explore the use of advanced management technology to improve the provision of traffic safety activities in Oakland County. The remainder of this section will deal with the application of the information-based management model developed in Section 2.0 to the traffic safety situation in Oakland County.

### 3.1 STRATEGIC PLANNING

As specified in the Management Model discussion in Section 2.0, this category of activities deals primarily with component task A-1:

To determine what the desired characteristics of the environment should be--establish objectives and priorities.

This decision-making on policies and objectives for the coordination of traffic safety activities throughout Oakland County is performed almost entirely by TIA. The individual agencies, of course, plan their traffic safety related activities, but this is fragmented unilateral activity which falls in the management and operation levels rather than in the strategic planning category. The only body dealing primarily with traffic safety for the county as a whole is TIA.

This function is performed in TIA by the Executive Committee of the Board of Directors. This committee has expressed its



concern with the traffic accident situation in Oakland County and its desire to do something about it on a county-wide basis. In addition, it has established policy constraints on sources of funding, types of activities to be undertaken, etc. Finally, it has served as a review body to ensure that proposed programs fall within the policy guidelines.

The Executive Committee of the TIA Board of Directors has done well in its concern for traffic safety at the county-wide scale. Only slight modifications are required in order for this committee to effectively perform the strategic planning function for the county-wide traffic safety management operation. With this aim, the following recommendations are made:

1. Initiate regularly scheduled meetings at least four times per year. This frequency is necessary to insure continuous and adequate control over management planning staff activities.
2. Take the initiative in reviewing management planning staff operations. This includes not only the programs developed by staff but also the capabilities and resources available to the staff. If these are not seen as sufficient, the Strategic Planning body should initiate actions to rectify the situation.
3. Specify priority areas for intensive management planning staff involvement. This is necessary to guide operations in the direction desired by the Strategic Planning body.
4. Maintain, consolidate and strengthen relationships with higher levels of government. Oakland County is not isolated and its operations must mesh with those proposed for the state as a whole. Mechanisms must be established for providing continuous relationships with the State and Federal Government, primarily via the Michigan Office of Highway Safety Planning.

5. Maintain a membership representative of leadership in the County. Included should be public and private officials, both elected and appointed. This is necessary both to maintain legitimacy in the eyes of the public and to insure sensitivity to public sentiments.

Policies, objectives, priorities, etc., established by the strategic planning body should be transmitted to the staff managing director who has the responsibility for implementing them. However, the managing director will certainly have some input to the strategic planning decision-making process.

### 3.2 MANAGEMENT PLANNING

Management planning activities--identifying and specifying problems, developing programs, and evaluating programs--is typically highly decentralized in the traffic safety field. Because services are provided by a host of autonomous bodies, the planning of these actions is done autonomously also. In Oakland County the fragmentation of management planning caused by this decentralization takes two forms. The most obvious is geographic fragmentation. Each jurisdiction has its own geographic area for which it plans. There is no assurance of uniform planning across the county, nor is there assurance that adjacent counties will be consistent in their approach. The second type of fragmentation exists within jurisdictions where different departments provide different services, and each does its own planning.

Overlooking the fragmentation problems, management planning activities can only be described as woefully inadequate. Problem identification tends to jump immediately from visible symptoms to specific tasks--tasks which are too often defined by departmental limits rather than characteristics of the problem. (Some of this may be due to the high cost of analytic technology, cost that prohibits its use by small, independent units.)

Since responses to traffic safety problems are generally developed on a departmental basis, attempts at county-wide programming and coordination are clearly the exception. The Oakland County Road Commission has undertaken passive attempts to convince local governments to participate in county-wide roadway improvement activities.

Finally, the evaluation of projects and programs is spotty at best. Traffic records are maintained but it is difficult to tie them to the implementation of specific programs. Partly this reflects the state-of-the-art in highway safety technology, and partly it reflects the fact that highway safety problems transcend departmental and jurisdictional boundaries, thus making evaluation at the local level unreliable if not impossible.

The above paragraphs describe management planning in highway safety as it occurs in most counties. In Oakland County there is one major exception. The Traffic Improvement Association has been attempting to perform the county-wide management planning tasks. TIA's efforts in data collection and processing, the seat belt campaign, and other programs were described above. In addition, the current demonstration program has included intensive efforts in county-wide problem identification and specification, as well as county-wide program development. The results of these efforts involve not only lists of problems and programs, but a repertoire of techniques for repeating the process on a periodic basis.

The demonstration project has yet to move into the implementation and coordination of county-wide programs, but TIA has attempted to initiate interaction between jurisdictions by convening meetings of police chiefs, traffic engineers, driver education instructors, etc. This was not done as a means of implementing specific common programs, but rather to foster awareness of common problems and generate joint activities.

Section 2.0 identified eight component tasks as composing the Management Planning category (See Figure 3, above). While it is unrealistic to expect that all eight of these tasks can be immediately established, full blown, within TIA, it is possible to use the management model as a basis for recommended changes in TIA staff activities. The following pages will look at TIA in terms of the eight component tasks and recommend modifications. As will be seen, the emphasis will vary between the eight tasks.

#### Task B-1

To recognize when the characteristics of the environment are not, or are not expected to be, as desired.

TIA should continue its efforts at this type of problem identification. The state of traffic safety analysis suggests that detailed computer-based models will not be practicable for this type of activity. However, the demonstration project itself has developed some techniques that appear to be applicable.\* In particular, the investigation showed that traffic safety problems can be identified both by examining statistical measures of the accident experience and by assessing the perceptions of persons active in the field. It is recommended that a schedule for periodic systematic problem identification via these methods be established.

Statistical analysis of accident data is the most time consuming method and generally provides only supplementary insight to the problems. This work is not necessary on an annual basis. Probably every three or four years will be sufficient and will allow analysis of major changes in trends based on new data files.

The assessment of local practitioners is a particularly effective means of subjectively identifying problems as well as differentiating between specific facets of problems. The

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\*Munson, M. J., et al. "Task 2: Analysis of Highway Crash Problems and Priorities", Vols. I & II, Interim Rept. No. HSRI-002330-2, 15 April 1971.

task force approach initiated as part of the demonstration program was successful though time consuming. Convening these groups on a bi-annual basis will provide sufficiently detailed problem specification for remaining planning work.

The mail-out survey technique is a relatively quick means of assessing the relative importance of various traffic safety problems as perceived by practitioners in the field. It involves little effort by the respondent and takes little time for analysis of the data. The information generated provides excellent back-up reference to the task group deliberations. It is recommended that such a short, priority survey be administered annually to at least a sample of the total list of current practitioners.

The Michigan Office of Highway Safety Planning (OHSP) is involved in traffic safety problem analysis on a state-wide basis. Close interaction with OHSP could well provide considerable assistance in local problem identification, and allow local efforts to concentrate on specification, cause and effect analysis, and priority ranking.

Task B-2

To examine the workings of the environment to determine why the desired states are not occurring, or are not expected to occur.

Once a problem is identified, it must be further specified by determining its causes--what factors in the environment cause the deviation from the desired state.

This task, while important, must be given secondary emphasis. Deficiencies in the state-of-the-art of traffic safety analysis, and limited time and resources available, indicate that a highly refined systematic approach to this task is unrealistic. It is recommended that the staff continue to utilize its expertise and subjective understanding of the accident system to identify cause and effect linkages.

Certainly, as experience accumulates, this subjective process will become a closer approximation of reality. However, it is critical that the focus be on problems at this point and not become forced into a task or departmental mold.

Task B-3

To propose and pretest changes in the environment which would return, or bring, the characteristics to the desired states.

Under the demonstration project, TIA undertook some program development activity. This should be continued and expanded since it forms the basis for effective response to traffic accident problems. A technically competent and highly creative staff must concentrate on conceiving effective ways of alleviating the specified problems. They must be familiar with the most current technical research yet completely aware of the capacities and capabilities of the relevant local operating units.

Obviously computer-based models for simulating and pre-testing the results of potential programs will not be available to TIA. Instead, the staff will be required to make subjective and technical estimates of the impact of each of the various potential programs. This of course requires that evaluational criteria be established for the various programs.

Task B-4

For solutions appearing successful in the pretest, to determine feasible means of implementation, including the identification of the proper implementing persons or units.

Once an acceptable program is developed, the next step is to determine means of implementing it. The management model of Section 2.0 calls this the "programming" phase which deals with determining which parts of the program can be performed by which operating unit. A great deal of care must be taken during this activity to insure that local capabilities and

resources are not exceeded, and that interactions between components are established.

Nevertheless, it must be remembered that the action plan (sets of projects and implementing units) generated here is hypothetical and tentative. As a potential pairing of acts and actors the action plan is intended as a basis for negotiating action projects during the coordination activities. The action plan generated during the programming phase should not be allowed to become an end in itself.

#### Task B-5

To communicate to the proposed implementing persons or units the nature of the situation to be changed, the proposed activities, and the potential resources available.

This task, loosely termed coordination, comprises both the major divergence from traditional planning operations and the primary key to success in multi-governmental management. Too often planners complete the program development phase and assume that their tasks are finished. It is a basic premise behind the recommendations in this report that careful, planned, systematic coordinative efforts are required for the successful implementation of coordinated programs. These interactions between the management planning staff and the operating units are termed "negotiations." The first need of the management planning staff is strategies for negotiation.

A negotiating strategy necessarily answers two questions: Whom to negotiate with, and how to negotiate with them. The first question is answered, tentatively, by the action plan. It is recommended that negotiations be directed specifically towards those operating units which are relevant to a given program, rather than towards all units in general. This identifies the targets. It does not imply that all relevant units should be approached in the same manner at the same time.

The "how" question is extremely important. The management planning staff must devote a great deal of time and energy to the development of systematic characterization of every potential operating unit in the county. The answers to the "how" question will depend both on characteristics of the operating unit and on the participation desired of the operating unit.

A great deal of this type of knowledge will be generated by observing the reactions of various operating units to negotiation attempts. This, of course, should be recorded and analyzed. However, to allow these initial efforts to be somewhat guided, it is highly recommended that the management planning staff engage in intensive research, simultaneous with the program development efforts, aimed at developing the characterizations of the operating units, developing a potential list of negotiating styles and techniques, and making tentative matches of units and techniques.

When negotiations do take place, it must be remembered that the intent is not necessarily to agree on the tentative action plan right down to the letter. Rather, it is desired to develop a set of related projects which are agreeable and acceptable to the operating units, and which approximate the end result of the initial action plan.

Along with the negotiation aspect between the management planning staff and the operating units is the need for establishing the inter-relationships between the various projects, and fostering interactions between and among the various operating units. Such interaction will foster not only a greater awareness of common problems, but also a better understanding of capabilities and constraints. Coordinative agreements will be more easily reached given this greater understanding and awareness.



#### Tasks B-6, B-7, and B-8

To monitor the activities of the implementing units to see whether the proposed activity is, in fact, carried out. If not, the failure to get the activity implemented must be considered as an undesired state of the environment.

To monitor the actual changes in the environment as a result of the implemented action in order to build up a memory of how the environment responds to various activities.

To continually re-assess the environment in order to revise the solutions and/or the recognized problems.

These three component tasks will be discussed together as different forms of evaluation. It has previously been stated that detailed evaluation of traffic safety programs is very difficult. Given the state of the art it is impossible to relate changes in the traffic accident experience directly to individual programs and projects. Nevertheless, some type of evaluational information is needed for program development activities.

In the absence of detailed evaluative models it is recommended that the management planning staff undertake the following three types of evaluative activities which correspond to the three evaluation component tasks.

1. Initiate detailed periodic assessment of program and project activities by jurisdiction. The data here could take the form of the volume and coverage measures specified by Peat, Marwick, Mitchell & Co. in "National Highway Safety Program Management and Reporting System."
2. Continue monitoring of the traffic accident situation by the Traffic Data Center generating periodic summaries by jurisdiction or smaller areas.
3. Periodically compare trends emerging in the accident data and trends in the assessment data.

Each of these evaluation activities provides information for some facet of the management planning function. Monitoring accident data provides information on the magnitude and type of problems existing to the problem identification phase. Assessing activities provides information on operating units' capabilities and activities to the program development phase and the coordination phase. Trend comparison begins to develop empirical relationships between traffic safety activities and the accident situation.

Most of the data required by the three recommended evaluative activities is collected now or can be easily collected by the operating jurisdictions. The specific variables and measures to be recorded are specified in the coordination negotiation activities, but should be uniform across the county.

In summary form, the recommended Management Planning activities, vested in TIA, are,

1. Mass statistical analysis on four year interval.
2. Problem probing task groups on two year interval.
3. Mail-out practitioner priority survey on annual basis.
4. Subjective analysis of cause and effect linkages.
5. Expand staff activities in program development (planning).
6. Subjective pre-evaluation of potential programs.
7. Extensive involvement in "programming" of selected programs.
8. Commitment to "negotiations" as means of developing and coordinating project activity.
9. Research into development of negotiation strategies.
10. Periodic systematic assessment of program activities.
11. Continued monitoring of accident experience.
12. Periodic comparison of assessment and monitoring information.

To conclude the recommendations for management planning operations, some words must be said about relationships with

the State and Federal governments. The management planning body should function as the primary link between the Michigan Office of Highway Safety Planning (OHSP) and all traffic safety operations in Oakland County. This means that the staff should aid local units in preparing State funding requests and keep the State OHSP up to date on county activities. The State OHSP is, in turn, a primary link to the National Highway Traffic Safety Administration.

### 3.3 OPERATIONAL CONTROL

As mentioned earlier, traffic safety services are delivered by a variety of operating units which are free from control by any coordinating body. Influence is strictly via coordinative negotiations. At present, these units provide services in a task-oriented manner concerned more with the performance of an act than with a service to the public. Evaluation of this performance is also task oriented and data, where collected, are inconsistent across jurisdictional boundaries.

While recommendations in this category cannot be directly implemented by the coordinating body, they can be considered during the negotiating activities. Operational control will, however, continue to be the realm of the operating units. The following recommendations are aimed at improving these activities.

1. Attempt to modify the task orientation towards that of providing a needed and recognizable public service.
2. Attempt to induce the development of coordinated activities both within and across jurisdictional boundaries.
3. Attempt to measure the success at providing the service rather than performing a task.
4. Encourage the periodic collection of data in standardized form.

### 3.4 ORGANIZATIONAL STRUCTURE CONSIDERATIONS

The recommendations presented above have followed the three category framework of the Management Model presented in Section 2.0. It remains to tie these functional recommendations together in an organizational structure. Such a structure deals with specific offices, people, or groups of people, and the explicit lines of authority between them.

A recent report by the National Association of Counties Research Foundation (NACORF) suggested the following four possible organizational structures: The Traffic Safety Department, The Traffic Safety Commission, The Office of Traffic Safety Coordination, and The Traffic Safety Association.\* While the Oakland County Demonstration Project took place in the context of a traffic safety association (TIA) it is nonetheless appropriate to examine briefly all of the NACORF structures in the light of their applicability to the Oakland County case.

All four of the structural possibilities described by NACORF are shown in simplified form in Figure 5.

The "Traffic Safety Department" form, Figure 5(a), calls for the establishment of a full government department with the responsibility for coordinating traffic safety activities among other departments. This model is apparently intended for implementation within a single city since it requires legislative action by a government with home rule powers (not available in Michigan counties), and since it appears to deal with traffic safety activities within a single political jurisdiction (not consistent with the multiple jurisdictional county scene). The proposal also implies that the governing body will perform the strategic planning role for traffic safety activities which seems doubtful since city councils

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\*Powell, M.D., et al. Community Action Program for Traffic Safety. Guides I-IX. NACORF Final Rept. on NHTSA FH-11-7091, September 1970.

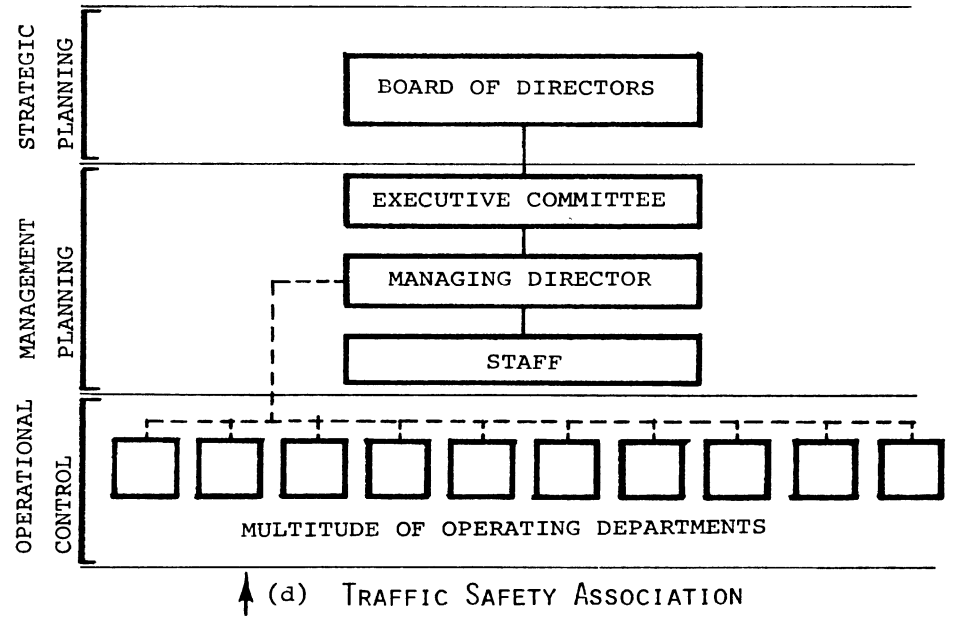
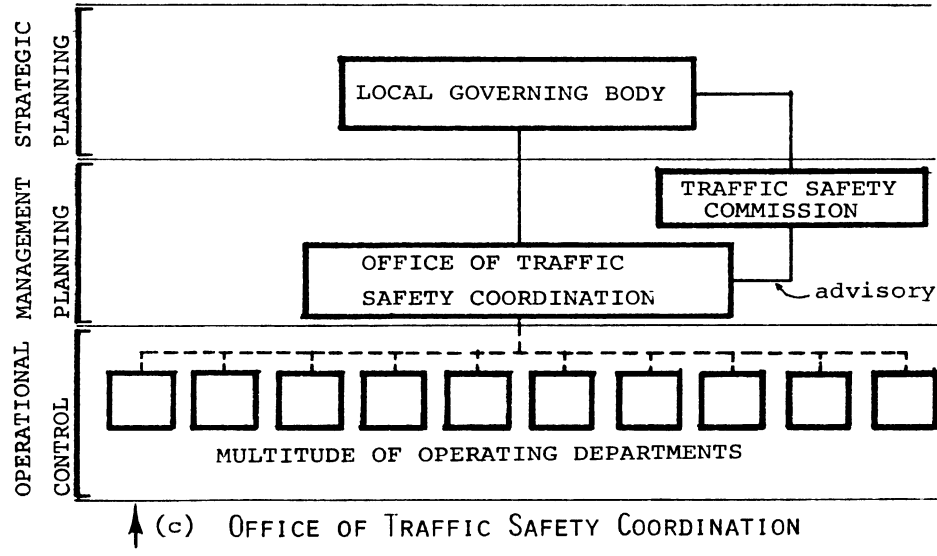
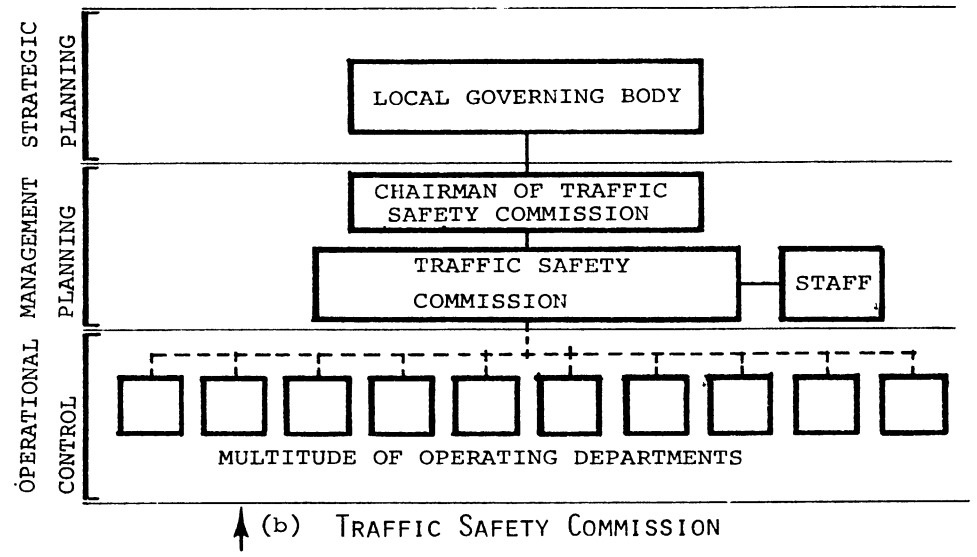
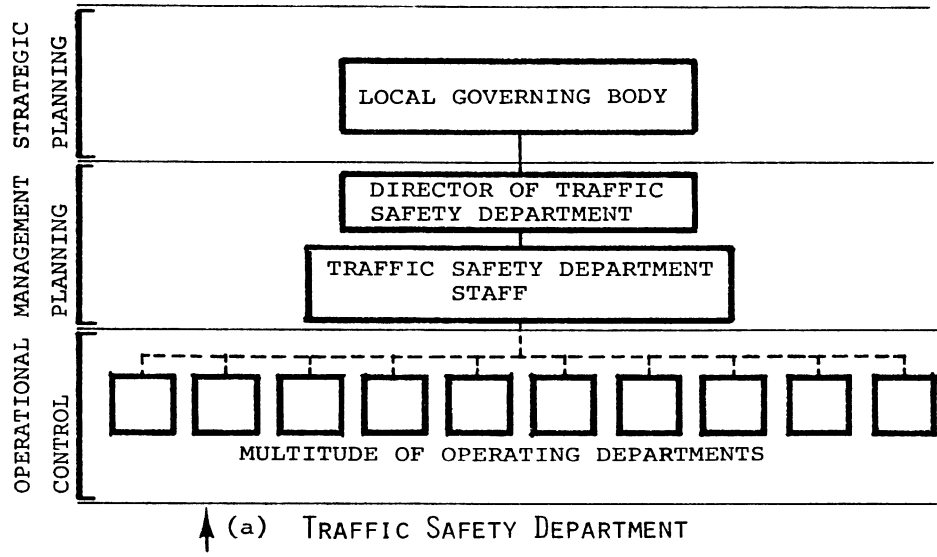


FIGURE 5. REPRESENTATIVE ORGANIZATIONAL STRUCTURES

are typically hard pressed to do effective strategic planning for routine city activities. In summary, the Traffic Safety Department structure is neither functionally nor legally suitable to the Oakland County operation.

The second NACORF structure is that of a "Traffic Safety Commission" established as a quasi-governmental adjunct to the local government, and having the responsibility for coordinating traffic safety activities within that government's jurisdiction. A simplified diagram of this structural proposal is shown in Figure 5(b).

This proposal is subject to all of the comments directed to the Traffic Safety Department structure plus the comment that it appears to indicate that the Commission members, themselves, undertake the coordinative activities. These activities require time and energy commitments beyond what can be expected from lay commissioners. This structural proposal, like that of the Traffic Safety Department, is not seen as pertinent to the Oakland County situation.

The third proposal by NACORF is that of an "Office of Traffic Safety Coordination" located within the executive office and responsible to the governing body. The office is assisted in an advisory capacity by a citizen's commission. Figure 5(c) is a simplified diagram of such a structure.

The Office of Traffic Safety Coordination can be established at either city or county level, assuming a county administrator's department, and can assume the responsibility of coordinating the traffic safety activities of the various departments within that unit of government. Presumably the local government is expected to perform the strategic planning role (a questionable fact as discussed with the Traffic Safety Department proposal). The Office of Traffic Safety Coordination is expected to perform the management planning role as well as undertake coordinative actions. Clearly some staff is required. With staff, this structure could

conceivably be applied to a multiple jurisdictional situation. However, the location of the office in the executive department of one jurisdiction would probably generate hostility, suspicion, or lack of cooperation on the part of the other units of government.

The final organizational structure proposed by the NACORF study is the "Traffic Safety Association." Figure 5(d) presents a simplified diagram of this proposal.

This structure calls for a non-governmental establishment initiated by private individuals. Such an association, having no ties to specific jurisdictions, is applicable in a multiple-jurisdictional situation such as Oakland County. However, the same freedom from jurisdictional ties means that the association has absolutely no legal authority over the units it is intended to coordinate. The structure, as proposed by NACORF, indicates that the staff is an aid to the managing director who undertakes the coordinative activities--a job much too demanding for one individual. All told, this structure is extremely similar to the Oakland County-TIA situation.

The functional model of management developed in Section 2.0 of this report can be imposed on any of the four NACORF proposed structures. However, due to the fact that three of the proposals require specific governmental action, and are thus limited to actions within that government's jurisdiction, and that TIA exists as a viable example of the Association structure, the organizational structure proposed for traffic safety management in Oakland County will follow the Association proposal. This recommendation is shown schematically in Figure 6 and will be described below. Central to this structure, is the TIA staff which consists of a flexible number of people involved, to varying degrees, in the functional activities specified earlier in this chapter. The staff is responsible to the Managing Director who, in turn, is responsible

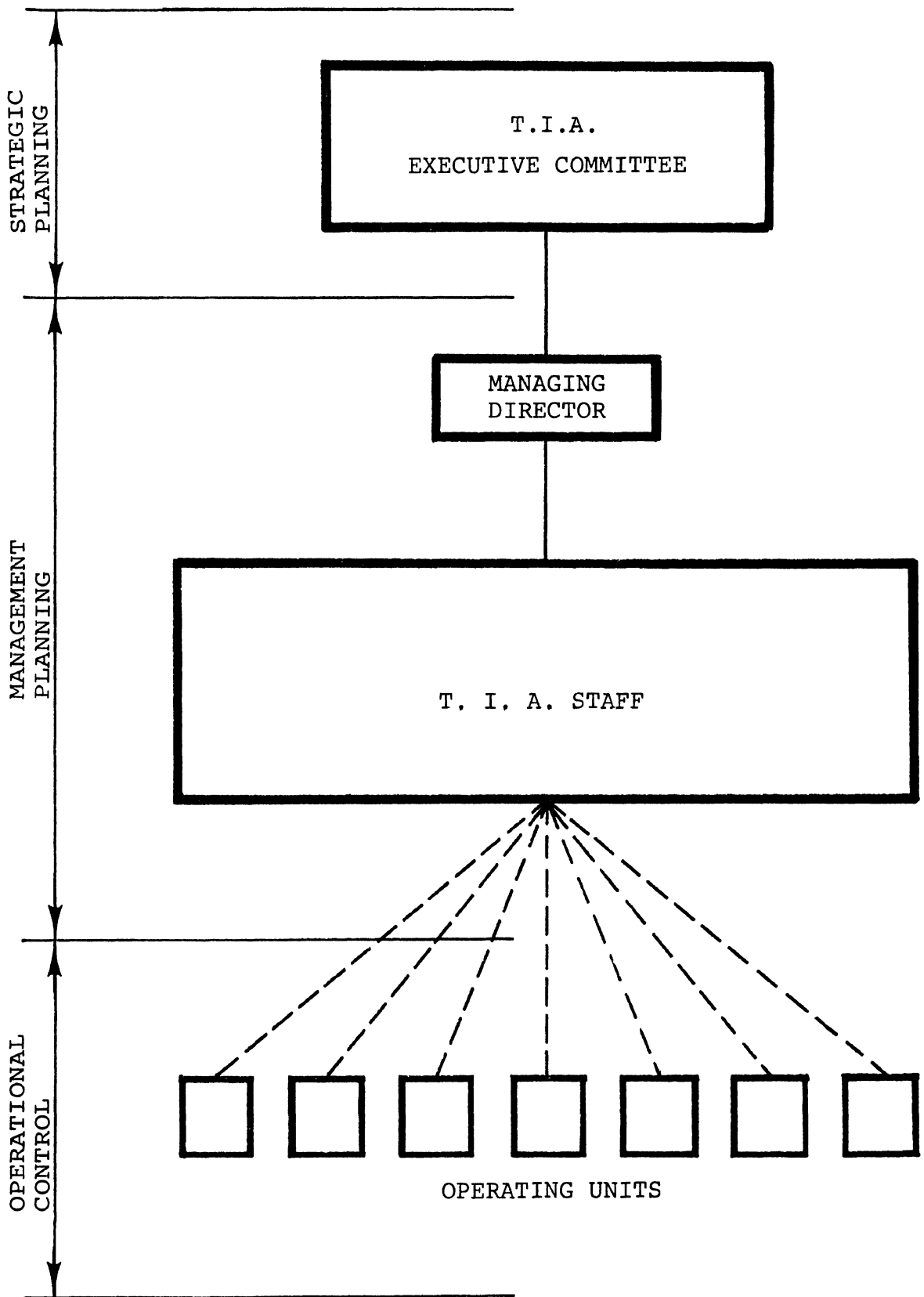


FIGURE 6. PROPOSED ORGANIZATION STRUCTURE



directly to the Executive Committee. It should be noted that the Managing Director is also a member of the Executive Committee.

At the Operational Control level, a large number of operating units function individually or in groups according to program needs. The relationship between these operating units and the TIA staff is obviously not based on explicit lines of authority. This fact constitutes the uniqueness of the situation. Rather than being based on authority, these relationships between the operating units and the TIA staff are based on intensive information exchange and personal interaction. Graphically, this is signified by broken lines on Figure 6.

In concluding this discussion of recommendations, it must be reiterated that they are experimental in nature. The recommendations derive from the management model presented in Section 2.0 which is perceived as the best hypothesis about how multi-jurisdictional management activities should fit together. The important thing, when implementing the various recommendations, is to keep the over-all system in view and not to deal with particular recommendations as if they were ends in themselves. Within this requisite overview, the fifth and final chapter of this report will present priorities and sequences for implementing the above recommendations.

## 4.0 IMPLEMENTATION OF THE MANAGEMENT SYSTEM

The preceding section presented a set of recommendations for establishing a county-wide management system based in TIA. Section 3.0 did not, however, assign priorities to the various recommendations, nor did it establish critical sequences for their implementation. It is the purpose of this final chapter to discuss means of implementing the recommendations. "Means of implementation" refers not so much to money as to critical steps, decision points, and priorities, and can be referred to as "implementation strategy."

For purposes of discussion, it will be necessary to list all of the recommendations from Section 3.0, to categorize them when they form logical groups, and to develop brief names and symbols for them. The symbols and names will be referred to throughout the remainder of this chapter. Table I lists the recommendations and gives the appropriate abbreviations.

### 4.1 APPROACHES

In the simplest possible terms, there are two fundamental approaches to implementing the management system, depending on whether the primary driving force is located in the strategic planning body (TIA Executive Committee) or the management planning body (TIA staff). Certainly this is not a black or white situation. It is recognized that the impetus for implementation will probably come from both groups in varying degrees. For illustrative purposes, the two will be considered as separate approaches.

The management model presented in Section 2.0 suggests that the strategic planning body should provide the stimulus for management system activities by establishing policies, priorities and objectives. It is logical, therefore, to initiate implementation of the management system via the strategic planning body. This requires, first of all, that the

TABLE I. ABBREVIATIONS FOR RECOMMENDATIONS

ABBREVIATIONS	STRATEGIC PLANNING RECOMMENDATIONS
A-1 REGULAR MEETINGS	<ul style="list-style-type: none"> <li>● Initiate regularly scheduled meetings at least four times per year. This frequency is necessary to insure continuous and adequate control over management planning staff activities.</li> </ul>
A-2 REVIEW MANAGEMENT PLANNING OPERATIONS	<ul style="list-style-type: none"> <li>● Take the initiative in reviewing management planning staff operations. This includes not only the programs developed by staff but also the capabilities and resources available to the staff. If these are not seen as sufficient, the Strategic Planning body should initiate actions to rectify the situation.</li> </ul>
A-3 SPECIFY DIRECTIONS & PRIORITIES	<ul style="list-style-type: none"> <li>● Specify priority areas for intensive management planning staff involvement. This is necessary to guide operations in the direction desired by the Strategic Planning body.</li> </ul>
A-4 RELATIONS WITH OTHER GOV'T UNITS	<ul style="list-style-type: none"> <li>● Maintain, consolidate and strengthen relationships with higher levels of government. Oakland County is not isolated and its operations must mesh with those proposed for the state as a whole. Mechanisms must be established for providing continuous relationships with the State and Federal Government, primarily via the Michigan State Office of Highway Safety Planning.</li> </ul>
A-5 REPRESENTATIVE MEMBERSHIP	<ul style="list-style-type: none"> <li>● Maintain a membership representative of leadership in the County. Included should be public and private officials, both elected and appointed. This is necessary both to maintain legitimacy in the eyes of the public and to insure sensitivity to public sentiments.</li> </ul>
ABBREVIATIONS	MANAGEMENT PLANNING RECOMMENDATIONS
B-1 PROBLEM I.D. & SPECIFICATION	<ul style="list-style-type: none"> <li>● Mass statistical analysis on four year interval.</li> <li>● Problem probing task groups on two year interval.</li> <li>● Mail-out practitioner priority survey on annual basis.</li> <li>● Subjective analysis of cause and effect linkages.</li> </ul>
B-2 PROGRAM DEVELOPMENT	<ul style="list-style-type: none"> <li>● Expand staff activities in program development (planning).</li> <li>● Subjective pre-evaluation of potential programs.</li> <li>● Extensive involvement in "programming" of selected programs.</li> </ul>
B-3 COORDINATION & NEGOTIATION	<ul style="list-style-type: none"> <li>● Commitment to "negotiations" as means of developing and coordinating project activity.</li> <li>● Research into development of negotiation strategies.</li> </ul>
B-4 MONITORING & EVALUATION	<ul style="list-style-type: none"> <li>● Periodic systematic assessment of program activities.</li> <li>● Continued monitoring of accident experience.</li> <li>● Periodic comparison of assessment and monitoring information.</li> </ul>
ABBREVIATIONS	OPERATIONAL CONTROL RECOMMENDATIONS
C-1 PROJECT IMPLEMENTATION	<ul style="list-style-type: none"> <li>● Attempt to modify the task orientation towards that of providing a needed and recognizable public service.</li> <li>● Attempt to induce the development of coordinated activities both within and across jurisdictional boundaries.</li> <li>● Attempt to measure the success at providing the service rather than performing a task.</li> <li>● Encourage the periodic collection of data in standardized form.</li> </ul>

Executive Committee endorse the concept of a county-wide traffic safety management system as proposed. If the Executive Committee does not approve the concept, they are in effect saying that it is not something that TIA should be involved in and the whole package may as well be shelved. Such refusal is not anticipated since the Executive Committee has been aware of the development of the management system package throughout the demonstration project.

Assuming acceptance of the concept, the next step is to obtain the commitment of the Executive Committee to getting the management system implemented. While the exact nature of this commitment will be discussed later, it is important to note that it includes the possibility of increasing the resources available for implementing the management system.

It is at this point that the two fundamental approaches to implementation diverge. If commitment is not given at the Strategic Planning level, the primary motivation for implementing the recommendations will have to come from the Management Planning level, i.e., the TIA staff. If this is the case, the staff will have to implement the system as best they can with current resources. Without Strategic Planning commitment, it is doubtful that additional resources will be made available. The general thrust is to implement as much of the management system as possible and use the results to demonstrate its value to the Executive Committee, hopefully obtaining commitment at that time for expanded implementation.

Figure 7 depicts the two basic implementation sequences and their relationship to the recommendations which were listed in Table I above. It is clear that the two approaches differ primarily in whether the Strategic Planning recommendations or the Management Planning recommendations are carried

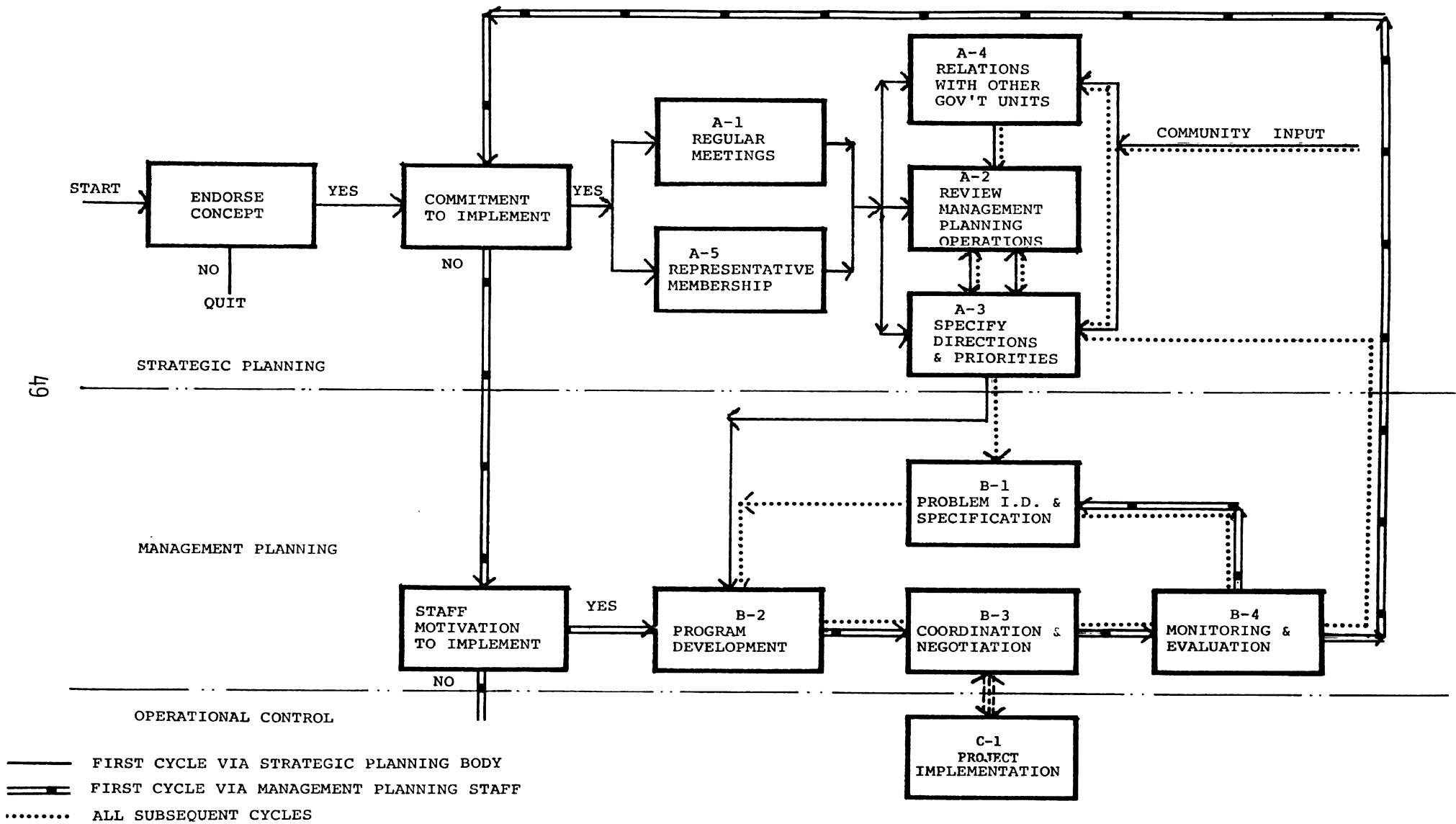


FIGURE 7. IMPLEMENTATION SEQUENCE

out first. Given these two implementation paths, the remainder of this section will discuss the individual cells in Figure 7, their content, their sequence, and some indication of their priority. The discussion will begin at the Strategic Planning level.

4.1.1 STRATEGIC PLANNING MOTIVATION. The need for the Strategic Planning body to endorse the concept of a county-wide management system has already been discussed. It is evident that without such endorsement the likelihood of successful implementation is very small. Assuming that such endorsement is established, the next question is one of commitment--commitment of the Executive Committee to the task of implementing the management system recommendations.

This commitment decision is one which the Executive Committee must make collectively, but also one which each member must make individually. This is true because the type of commitment required will demand, among other things, substantial time and energy from the individual members. They must be willing to attend meetings to review the traffic safety status of Oakland County, to establish policies and objectives for TIA's traffic safety operations, etc. In addition, they must be willing to put their good names behind the programs that the management planning staff develops and attempts to implement. This is no small commitment, with little offered in return except a sense of accomplishment and the association with an effective and successful organization. If this commitment is not forthcoming, the sequence shifts to implementation via management planning staff motivation.

At this point, however, it will be assumed that such commitment is obtained and the Executive Committee begins the necessary steps to make itself into an active and vigorous part of the management system. It begins to implement the Strategic Planning recommendations presented in Section 3.0. As indicated in

Figure 7, the Executive Committee must first consider and act upon two procedural or operational matters. These are: A-1, establish regularly scheduled and fairly frequent meetings; and A-5, establish a membership representative of leadership in the County. Each of these will be discussed briefly before getting to the functional recommendations.

A-1: Establish regularly scheduled meetings. This recommendation follows quite obviously from the decision to take an active part in the management system. The Executive Committee cannot perform its functions without convening on a regular and frequent basis.

A-5: Establish a membership representative of leadership in the County. The rationale for this recommendation is given in the previous section. At this point it will only be stated that the first step should be to increase representation of elected leaders on the Executive Committee.

With the procedural matters taken care of, the Executive Committee can begin to undertake the three functional recommendations. Quite likely, activities relating to all three will be undertaken during the same time period. The first functional recommendation, A-4: Maintain and strengthen relationships with other units of government, includes two related notions. The first is that of finding out and keeping abreast of what other units are doing, particularly the State, the Federal government, and contiguous counties, in order to prevent inconsistencies with Oakland County traffic safety activities. This calls for frequent liaison with the Michigan Office of Highway Safety Planning concerning their programs and objectives, and with local traffic safety policy-makers.

The information generated by recommendation A-4 becomes input to A-3: Specify Directions--policies, priorities, and objectives. This recommendation is basically self-explanatory. Based on measures of the traffic safety situation generated by the management planning staff (the Demonstration Project in

the first instance), information on activities of other units of government, and their own sense of public needs, the Executive Committee must decide in which direction the management planning staff should concentrate their energies. At the present time these decisions have been made as a part of the Demonstration Project.

This activity is very closely related to functional recommendation A-2: Review Management Planning operations. This relationship takes two forms. It is difficult to review management planning operations--programs, resources, skill capabilities, etc.--without knowing the policies, objectives and priorities which guide the operations. On the other hand, it is difficult to specify objectives and priorities without knowing what the management planning staff is, or is not, capable of doing. These two facets merge when the strategic planning body decides that to meet the desired objectives, the management planning must have additional resources or technical expertise. In this case the Executive Committee must determine how to support such an increase. This is the only way in which resources to support the management system can be generated.

Given the high degree of interaction between functional recommendations A-2 and A-3, the output of A-3 becomes the guideline for continued action for the management planning staff. The normal sequence would be for these policies, priorities, and objectives to be inputs to the problem identification and specification function, B-1, but since a great deal of work in this function has been done as part of the demonstration project, it is logical to lead directly to functional recommendation B-2: Program Development. It is important to note that this would begin the implementation sequence if the Executive Committee had not provided the necessary commitment and the management planning staff had provided the primary driving force for implementing the system.



#### 4.1.2 MANAGEMENT PLANNING MOTIVATION

The management planning recommendations are developed quote explicitly in Section 3.0. This will focus primarily on the sequence in which they should be implemented. Beginning with recommendation B-2: Program Development, it is evident that considerable progress has already been made under the demonstration project. Several programs aiming at different problem areas have been developed.

One important fact that must be considered as these programs are refined is that, given the state of the art in traffic safety countermeasure development, any comprehensive program must be viewed as an experiment. As an experiment it is extremely important that records be kept documenting what actions are intended to be undertaken and what the results are expected to be. The expected results should be specified as carefully as possible since that will form the basis for evaluation of the program after it is implemented.

Following the program development phase, the next management planning recommendation is B-3: Coordination and Negotiation. The primary concern is to determine exactly who it is necessary to deal with in order to implement the various parts of the plan. Once that determination is made, strategies for dealing with them can be developed ranging from all-inclusive group sessions to intensive discussions on an individual basis. The method used will depend on the program to be implemented and the parties to be negotiated with. It is highly recommended that serious thought be given to preparing a strategy for these coordination negotiations.

The next management planning recommendation is B-4: Monitoring and Evaluation. However, before discussing that activity, some points must be made about the operational control recommendation C-1: Project Implementation. This activity

is obviously out of the direct control of the management planning body and therefore recommendations can only be indirectly implemented. As a result, the items included in C-1 pertain primarily to general attitude of the operating units. These attitude recommendations can only be suggested via the coordination and negotiation process and are mentioned here as things to be kept in mind by the management planning staff while involved in the coordinative efforts.

Management Planning recommendation B-4, Monitoring and Evaluation, is the final segment in the normal cycle of management planning activities. Two points are important concerning this recommendation. The first deals with the fact that comprehensive and cooperative traffic safety countermeasure programs must be viewed as experiments. The evaluation of experiments is equally as important as the implemental actions since it provides a means of learning from the experience. Thus, it is important that for each program a detailed report be prepared as a part of the evaluation function. This report should build on the statement of proposed actions and expected results prepared as a part of the program development phase, and should include a detailed description of what was actually done and what actually resulted. The expected characteristics and the actual characteristics can be compared as in normal evaluation. However, as a report of an experiment, it is necessary to go beyond that and attempt to explain any deviations of actual from expected results. Only with this type of information can program development activities become in any way systematic.

The second comment on evaluation deals with to whom the evaluative information is distributed. This kind of information generally takes three forms, each with a different target group. First, there is assessment information which deals

with what the operating units are doing and how well. This information should be transmitted back to the operating units themselves so that they can modify or improve their tasks. The assessment data should also be transmitted to the program development staff for use in determining which operating units should be related to specific projects in subsequent programs.

The second type of information deals with the effect of the various programs and constitutes the experiment reports discussed above which are used in subsequent program developments. If the strategic planning body has not given the high degree of commitment discussed earlier, this type of effectiveness information should be presented to them as a means of inducing the commitment for future cycles.

The final type of information deals with the evolving state of the traffic safety situation in the county--measured by a relatively small set of key indicator variables. This information goes to the problem identification phase (recommendation B-1 to be discussed below) which screens it for oddities which might suggest an emerging problem. It is also transmitted to the strategic planning body which uses it in re-assessing priorities and objectives.

The remaining management planning recommendation, B-1: Problem Identification, is normally the first in the management planning cycle. In the present go-around, it was performed as part of the demonstration project and will thus be discussed last in this sequence. It is actually the beginning of the next cycle. The means of undertaking the problem identification task have been developed in Section 3.0. At this point it is only necessary to state that the problem identification activities can only be performed adequately if data on the state of the traffic safety situation is available from the monitoring phase, and objectives available from the strategic planning body.

## 4.2 PRIORITIES

It is only fitting to conclude this section on implementation with some thoughts on priorities. Certainly, all of the recommendations made above are important to the operation of the entire system. However, some are more critical or more pressing, timewise, than others. The first and most crucial point is to obtain the necessary commitment from the Executive Committee. Attempts at this, however, are short term and a decision by the Executive Committee should come quite quickly.

Regardless of how that decision by the Executive Committee goes, the next high priority actions deal with implementing and evaluating the experimental countermeasures. The importance of those implementation and evaluation activities derives from the fact that both future resources and future improved programs depend on actions taken now and their impact on the traffic safety situation. Implementation and evaluation thus become the impetus for perpetuating the entire management system.

Finally, it must be remembered that the Management System recommended to the Traffic Improvement Association of Oakland County is in itself an experiment. The outcome of the experiment depends both on the design and on the implementation. This report has presented a design based on a conceptual model and an analysis of the existing county-wide management situation, and some recommended procedures for implementing the design. It is incumbent upon TIA, as the primary implementing organization, to systematically and conscientiously review and evaluate the progress of the experiment. Only in this manner will it be possible to learn from the attempt, refine the experiment, and make this task of the demonstration project the beginning of an ongoing adaptive process.