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15. Supplementary Notes			
16. Abstract <p>The objective of this study was to develop criteria and procedures for the identification and measurement of social impacts in transportation planning and the process by which such analyses are integrated into the decision-making process. The guidelines developed from this study address several related but different parts of the total planning and design process. Two of the reports prepared as a part of this study are concerned with identifying and measuring social factors and conducting social and economic surveys to obtain necessary data. A third report is concerned with the development and implementation of community involvement programs. The assumption is made that an effective planning and design process must provide means by which the values and opinions of residents of affected communities and users of transportation facilities can be incorporated in technical studies and in the decision-making process.</p> <p>Two additional reports contain guidelines for the operation of interdisciplinary teams and team scheduling and management. The systematic interdisciplinary approach undertaken in the State of Washington provides a means by which technical data, community values and opinions, and planning and design concepts and standards can all be evaluated by the team in reaching a recommended solution to a problem.</p>			
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The contents of this report reflect the views of the authors who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the State of Washington, Department of Highways; and/or U. S. Department of Transportation, Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

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Valuable suggestions and guidance in conducting the study was received from Mr. Hollis Goff, Assistant Director for Planning, Research and State Aid Division of the Department of Highways; Mr. Russell Albert, Planning Engineer; Mr. Bruce Davidson, Environmental Planner; and Ms. Willa Mylroie, Research and Special Assignments Engineer.

SOCIAL FACTORS IN TRANSPORTATION PLANNING

EXECUTIVE SUMMARY

During the last decade changing values and priorities of modern America have greatly affected transportation planning. Greater concern about protecting and improving the quality of life and maintaining a viable economy has made it necessary to analyze the social and economic impacts of all types of developments in more detail. Citizens have become more involved in the transportation planning process and various groups which were not active in the formulation of legislation and policies concerning transportation have now become quite adept in injecting their concerns in the decision-making process. The role of the planner and the decision maker have become more complicated and difficult.

The objective of this research effort was to develop guidelines that would enable professional personnel and citizens to identify and measure social impacts more adequately and provide a systematic approach for the consideration of such impacts in the decision-making process. Five documents containing guidelines which address related but different parts of the total analytical and decision-making process are described in this summary. These guidelines have been developed for three major areas of concern: (1) identification and analysis of social impacts and the development of procedures for efficient and economical collection of necessary data; (2) planning and implementation of effective community involvement programs and (3) the operation, scheduling and management of interdisciplinary teams. The guidelines developed through this research project cover important aspects of the total process from data gathering to decision-making thereby providing a means by which adequate information can be obtained and analyzed from various sources and then considered carefully in seeking solutions to transportation problems.

Guidelines for the Identification and Measurement of Social Factors
in Transportation Planning

The purpose of these guidelines is to provide assistance in identifying and evaluating the social impact of transportation systems on both a regional and community or neighborhood level. With the increased emphasis on human factors in transportation planning, in part mandated by such federal statutes as the National Environmental Policy Act of 1969 and the Intergovernmental Act of 1968, it is necessary that a systematic approach to gathering social data and developing normative standards be developed.

To measure social impacts, existing social conditions must be identified and described within the region, the community, and the neighborhood immediately adjacent to the transportation facility. The time frame includes significant historical developments, the present and anticipated future changes. Within this time frame, primary and secondary social impacts are identified and measured. The guidelines contain a classification of types of impacts. In the first phase of analyzing impacts, the social structure of the community is examined and then the relationship between the social structure and the project is determined. The problems encountered in measuring social impacts are discussed and the efforts made to maximize the use of factual data and minimize the use of speculative opinions. The analytical approach described above is applied to basic social factors as an example of the method which can be followed for numerous primary and secondary impacts.

Guidelines for Conducting Surveys Concerning Transportation

The purpose of these guidelines is to provide specific assistance to those responsible for planning and implementing transportation surveys as a

tool to obtain the opinions of citizens and gather relevant social and economic data to measure impacts. Interdisciplinary teams working on major transportation projects in Washington State have utilized surveys as a vital tool in their community involvement programs and analytical reports. To insure the proper application of this device, the theoretical as well as the practical aspects of the survey process are discussed, including the relative merits of different techniques, questionnaire design, and examples of various transportation surveys. These guidelines seek to present this information in a manner that will enable persons having responsibility for project development and social scientists to undertake surveys cooperatively in an efficient manner.

The importance of careful measurement of attitudes is emphasized in each of the various steps involved in organizing and administering surveys.

Guidelines for the Development and Implementation of Community Involvement Programs.

The purpose of these guidelines is to assist interdisciplinary team members and project managers who have the responsibility for the development and implementation of community involvement programs. It has been the experience of interdisciplinary teams working on Washington State Highway Department transportation projects that to insure a successful community involvement program, the program must be tailored to meet the needs of each community. In addition to determining the form the involvement program should take, the community characteristics also determine how extensive the involvement program should be. These factors as well as methods to disseminate information and obtain citizen input, types of community groups which should be incorporated into the planning process, and ways to improve the success of public meetings

are all discussed with the hope of providing some guidelines for implementing an effective, multi-faceted approach to community involvement.

Guidelines for the Operation of Interdisciplinary Teams

The purpose of these guidelines is to assist interdisciplinary team members and project managers to carry out their responsibilities in an effective and efficient manner. Interdisciplinary teams in the Department of highways have the responsibility to (1) conduct indepth studies; (2) develop and implement community involvement programs; and (3) develop departmental recommendations for solutions to transportation problems. Experience has indicated that interdisciplinary teams are effective in developing solutions that are responsive to the needs and desires of the public and include well balanced designs. Various problems occur in the operation of interdisciplinary teams. This report addresses a number of these problems and provides procedural guidelines for team operation. Included is a discussion of the roles of the team; the responsibilities of the team members, the chairman, and project engineer; the integration of the study plan into the team's operations; and ways to improve interaction among team members.

The objective of the guidelines is to present procedures and suggestions based upon experience in the State of Washington that will improve the effectiveness and efficiency of the interdisciplinary teams and integrate the efforts of such teams into the decision-making process.

Guidelines for Team Scheduling and Management

The purpose of these guidelines is to provide some assistance to interdisciplinary teams and project managers in the scheduling and coordination of interdisciplinary teams. Because of the unique requirements of scheduling and managing the activities of an interdisciplinary team, a number of more

traditional techniques of project control have been inadequate because their basic logic of task ordering is time sequentiality. Since many of the activities of an interdisciplinary team can be carried on simultaneously or at any given time within the project's period, it is essential that the organizational system used reflect this. The system developed in this document, team program logic, does just that. The application of this method to both individual team members and the overall project is discussed to facilitate the adoption of this system.

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**GUIDELINES FOR THE
DEVELOPMENT AND IMPLEMENTATION
OF COMMUNITY INVOLVEMENT PROGRAMS**

Prepared by

**WASHINGTON STATE HIGHWAY COMMISSION
DEPARTMENT OF HIGHWAYS**

In Cooperation with

**U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION**

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15. Supplementary Notes					
16. Abstract <p>The purpose of this study is to produce guidelines that will provide assistance to those responsible for the planning and implementation of community involvement plans. These guidelines cover the many elements of a multi-faceted community involvement approach and give direction for planning and implementation of these guidelines.</p> <p>A considerable amount of recent experience and information on community involvement was compiled and analyzed to afford the capability of tailoring a community involvement plan for an individual and unique community as defined by its characteristics. Among the major elements discussed are the general principles which must be followed to achieve successful community involvement; the criteria to determine how extensive an involvement plan should be for a particular community as defined by the characteristics of the community and type of proposed action; the establishment of an implementation schedule; detailed discussion of the methods used to disseminate information and obtain citizen input; a description of the various types of community groups which can be used for cooperative planning; recommendations to improve the effectiveness of public meetings; and the basic strategy used in evaluating the success of a community involvement plan.</p>					
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INTRODUCTION

In recent years much emphasis has been placed upon the involvement of the public in the planning and design of transportation systems. Only through such involvement of citizens can the needs, values, and opinions of residents of various areas be determined. Public participation, therefore, is not only desirable but vital in an inclusive planning and design process. The degree of such participation varies considerably with the stage of development, the size of the project or study, and the type of area to be served.

In each case, however, the goal of community involvement is to ensure that transportation planning and design meets the actual needs of people and that decisions reached will be in the best overall public interest. The dual objectives are to provide meaningful information to the public and to receive advice and data that will be helpful in determining the course of action to take.

PURPOSE OF GUIDELINES

The procedure adopted by the Washington State Department of Highways to ensure community involvement requires that a formal plan to undertake such involvement be developed for all major projects and for systems planning. A Departmental Directive, "Community Involvement in Project Development", sets forth some specific criteria which must be met in preparing and implementing community involvement programs.

The purpose of these guidelines is to provide assistance to project managers and interdisciplinary teams in carrying out their responsibilities in planning and implementing community involvement programs.

The basic problem encountered by those persons having the responsibility to involve the public is how to make community involvement programs more effective for all concerned. Both the citizens and the Department of Highways want

the expression of public values and opinions to be a meaningful experience for those involved. A considerable amount of experience in community involvement efforts has made it possible to delineate some of the most successful procedures, methods, and techniques, and these will be discussed in this document.

MEANING OF COMMUNITY INVOLVEMENT

Community involvement in the planning of public programs is a basic concept which can be interpreted in various ways. Within the Washington State Department of Highways, "community involvement" refers to the participation of private citizens and public officials in the various steps that lead to the final decision concerning the course of action that is to be taken. The public input can be obtained in various ways, but the process is so designed that the values and desires of citizens must be considered by those persons having statutory responsibility to make decisions.

In various types of governmental programs, community involvement can range all the way from very little opportunity for participation in the planning process to a delegation of decision-making responsibilities. The approach adopted by the Department of Highways by Department Directive D 31-18 (PP) requires that the staff of the Department involve both private citizens and local officials in various steps that lead to the final decision. For major systems and project development studies, interdisciplinary teams are created to undertake those studies. Teams have the responsibility to initiate public participation and to document the results so that the Department and the Highway Commission can evaluate the community's input when making decisions.

APPROACHES TO PUBLIC INVOLVEMENT

To achieve the objectives of community involvement, the team must develop an interactive planning process involving the community. Traditionally, a public hearing has been held at the culmination of the planning process. However, experience has shown that often the public hearing has been an unsatisfactory forum for free exchange between members of the team and the community. Planners now use new, more effective methods to obtain meaningful community involvement. Because community involvement frequently helps planners achieve project objectives, its necessity is no longer an issue. In the long run it can expedite projects which support national and local transportation goals.

With few exceptions, experience has shown that no single method to achieve community involvement is adequate. Planners must offer to the citizen a variety of opportunities to participate in the planning process. The Department Directive 31-18 (PP) sets forth many methods and techniques to involve and advise the public during the project development phase. A good community involvement plan employs methods which reflect the nature of the project itself as well as the characteristics of the community in which that project will be located.

Community involvement efforts must be related directly to the various phases in the overall planning and design process. When a new highway (or an improvement to existing facilities) is superimposed on the rural landscape and/or on the urban fabric, transportation may be improved but the development of that highway may violate important community social and environmental values. The task is to plan a highway which is accepted by the community after an interactive planning process wherein "trade-offs" between conflicting values have been adjudicated.

Until recently, citizens of most communities have been unable to reach any agreement on the ranking of community values, and when such agreement is reached,

it is rarely documented. Further, community values may be subject to modifications as social and economic conditions change or as other projects are proposed. Because community values exist only in the minds of the citizens, secondary sources are rare. At the present time, highway planners are frequently forced to rely on their community involvement efforts in order to determine community values. The whole approach and organization of the planning process must provide for continuing community involvement if community values are to be clarified. The community involvement program may not produce a consensus on the relative importance of community values but it will at least reveal how different interest groups rank such values. A public relations campaign designed to sell the community on the need for the project is no substitute for community involvement. An effective, socially responsible community involvement program uses public relations to inform the public of possible highway transportation project alternatives, and then gives people an opportunity to have their interests expressed and seriously considered as part of the decision-making process.

GENERAL PRINCIPLES OF SUCCESSFUL COMMUNITY INVOLVEMENT

1. Sincere Desire to Involve the Public.

A successful public involvement process requires that the professionals involved genuinely desire to obtain and utilize information and opinions from the public. It also requires that citizens be concerned about developments in their communities and that their desires be expressed directly or indirectly during the planning of transportation systems and facilities.

2. Adequate Information

Without adequate information public participation cannot be effective or meaningful. Planners must provide easily understood information and use all

possible communication channels - including the news media - to reach the maximum number of persons. They must explain the implications of each alternative under consideration.

3. Free Exchange of Views

The procedures used to obtain information from the public must allow for open exchange of information and views, and free consideration of alternative courses of action. Without such an atmosphere, community involvement will exist in name only. Citizens, both professionals and laymen, have knowledge and insight about local conditions and community development values. The planners need information from the community on a continuing basis throughout project planning.

4. Interaction

The community involvement process must create meaningful interaction among the various segments of the community and the planners.

Interaction too frequently becomes a one-way flow of information or an exchange solely between a single citizen or single group representative, and a member of the Department of Highways.

Planners should urge the various segments within the area to listen to and understand all options. A true exchange of views usually suggests a course of action acceptable to the general public though not to all interest groups.

5. Community Values

Experience indicates that no one method obtains complete information about public values and desires.

Citizens of the community are almost always better qualified than the professional personnel to interpret community values. However, citizens are, to a

large extent, dependent on the planners for the information necessary to make "trade-off" decisions. Citizens need to know the potential impacts of each possible alternative before the alternative can be analyzed in terms of community values.

6. Potential Controversy

An effective public involvement program may minimize controversy over an extended period but will not eliminate it. On the contrary, an "open" planning process may create controversy at first. However, planners and policy makers become aware of major concerns early and are better equipped to deal with these. Hopefully, those issues causing controversy can be resolved as the study progresses. If such is not the case, the issues that need to be decided by decision-making bodies will be clearly defined for appropriate groups.

PREPARATION OF A COMMUNITY INVOLVEMENT PLAN

All highway development projects included within Group 1 and 2, as defined by the Action Plan, and systems planning efforts must have a community involvement plan prepared before the study begins. The community involvement plan identifies the specific objectives, activities, and methods that will be used to involve citizens and local officials, assigns responsibility for carrying out these activities, and establishes an implementation schedule.

OBJECTIVES

The statements of objectives for a project should relate directly to the overall planning assignment as set forth in the study plan. When formulating objectives, the specific size of its assigned project and its relationship to the community in which it is to be located shall be considered. Community

involvement required by a large system design differs from that required by a small project.

Repetition of trite objectives common to all plans is inappropriate; if such global goals are to be included, there should be a reason for doing so specific to the assigned project.

The overriding objective is to provide opportunities for involvement to the broadest range of community interest groups. Although it is usually more difficult to involve unorganized citizens, these established groups must not ignore those whose interests may be affected by the highway project even if there is no organization to represent them.

The plan should identify all affected interest groups, both those supporting and opposing the proposed project, and the team should strive to secure their participation. Many groups will indicate their interest, but special care should be taken to include for input: (a) low and moderate income families, (b) minorities, and (c) families and individuals living within or adjacent to the proposed facility site or corridor.

By interacting with such groups at an early point, the staff will learn at first hand the very real social and economic problems of the community, as well as its interests, goals, and opinions, all of which is needed by the staff to assist them in making decisions.

DESIGNATE RESPONSIBILITY

The methods by which each objective of the community involvement plan will be implemented should be defined and responsibility for doing so assigned. While a single person should be given overall responsibility, it is necessary to indicate how other staff members will actively participate. For those studies on which interdisciplinary teams are created, each team should have one member

who has had special training and experience in developing community involvement programs. However, other team members cannot be permitted to abdicate their individual responsibilities. Responsibility assignments make the role of each individual described more meaningful. On those studies where interdisciplinary teams have responsibility to implement the community involvement plan, the use of a subcommittee of the team will expedite the preparation and implementation of the plan. This subcommittee should consist of (a) the team member assigned the primary responsibility for community involvement, (b) the team chairman, and (c) the project manager. This subcommittee can undertake those duties listed below and others:

1. Draft the community involvement plan.
2. Present the draft plan to the team for review, no later than the team's second meeting.
3. Arrange to carry out such activities as: preparing, producing, and disseminating public information materials; conducting surveys; preparation of public meeting schedules and agenda; and formation of advisory committees.
4. Delegate duties among team members and district staff.

Team members will be dependent upon individuals and organizations outside its own membership. If citizen committees, public officials, and others are to be involved, their role and responsibilities should be spelled out in the plan.

METHODS

The description of the methods to be used in carrying out the stated objectives need not detail techniques and procedures. (Note that this document discusses a wide variety of methods and techniques in a subsequent chapter.)

Function Performed	Agency Responsible	Preparation of Program	Review and Approval	Implementation
System Planning				
Statewide Highway Plan	Department of Highways	Interdisciplinary Team	Asst. Dir. for Planning, Research and State Aid (PR&SA)	Team and Asst. Dir. for PR&SA
Metro. Transportation Studies	Regional Planning Agency	Agency Staff	Policy Body	Regional Planning Agency
Small Urban Transportation Studies	Policy Committee of Local Officials	Study Director	Policy Body	Study Director
Subarea Transportation Studies	Policy Committee of Local Officials	Study Director	Policy Body	Study Director
Project Development				
Major Impact:				
Location	Department of Highways	Interdisciplinary Team	District Engineer; Asst. Dir. for PR&SA	District and Team
Design	Department of Highways	Interdisciplinary Team	District Engineer; Asst. Dir. for Hwy. Development	District and Team
Minor Impact:				
Location	Department of Highways	Project Engineer	District Engineer	Project Engineer
Design	Department of Highways	Project Engineer	District Engineer	Project Engineer

Table 1. Assignment of Responsibility for Development and Implementation of Community Involvement Program

The selection of a specific method or technique should reflect the following constraints on community involvement:

1. The extent to which the community is already organized for involvement in planning.
2. The type of project involved.
3. The availability and willingness of citizens with special background and knowledge of the project to voluntarily participate.
4. The area of influence of the project. For example; in many cases, two neighborhoods or bordering towns may have irreconcilable conflicting interests.
5. The general support in the community for transportation projects as demonstrated by previous election issues.
6. The extent to which controversy has hampered or otherwise modified planning efforts in the past.

IMPLEMENTATION SCHEDULE

The schedule of community involvement activities must be coordinated with the overall planning schedule for the project and provide for appropriate citizen input at the following critical points in the overall planning process.

1. The establishment of objectives. Objectives must reflect the community's broader development goals. Team members must utilize community inputs at this first step in the planning process.
2. The collection of data. Information about the social and economic structure of the community is important to transportation planning; the team should give citizens of the community opportunities to evaluate the accuracy of collected data. (Note that a community

survey, a community involvement technique, provides opportunities for such evaluation.)

3. Delineation of alternatives. This task requires identification of those community values which are enhanced or diminished by each possible alternative.
4. Determining impacts. The team must give opportunities to citizens to identify any possible impacts that they foresee.
5. The evaluation of alternatives. The team must consider (a) probable impacts, (b) planning and design factors, and (c) community goals and objectives. Community involvement is essential to the appropriate consideration of these three steps.
6. Making a decision. The team should not make a decision until it has ascertained community opinions by use of appropriate methods.
7. Public presentation of the plan. The community should be consulted as to the time, place, and methods of such a presentation.

Community input is critical for each of the items listed above, but interaction between the team and the community is important throughout the entire planning process.

Scheduling of involvement activities, while critical to the team's internal operations, must also be convenient to the community. Activities and events must be scheduled at times and places so that a maximum number of citizens may participate and no group is deliberately excluded.

PART II

IMPLEMENTING THE COMMUNITY INVOLVEMENT PLAN

The implementation of the community involvement plan should begin with coordination with local governmental officials. In nearly every case, the transportation project may cause multi-jurisdictional impacts. Therefore, each of the interested jurisdictions should be contacted. (See Department Directive D 31-18). Each governmental unit or agency should be requested to name a contact person and to schedule briefings as deemed necessary. (Be sure also to put each contact person on the team's mailing lists.) Briefing sessions should facilitate a discussion of a project's potential impacts on each jurisdiction represented. The participants should differentiate between "local" problems, such as land use, and "regional" problems such as pollution.

As early in the process as possible, official representatives of each jurisdiction should present their particular interests and expectations for the project. Individual meetings, one at a time, should be scheduled for those public agencies having the greatest interest in the project.

After the local governments have been informed, a news release should be issued explaining the purpose of the study and some information concerning opportunities for community involvement. Concerned groups, such as environmental groups, the business community and minorities, should be invited to present their concerns and provide advice and assistance in solution of problems. Each group should be given ample time to discuss their concerns in a relaxed atmosphere. If possible, presentations should be recorded and analyzed. Ultimately, the staff should be able to document appropriate consideration of the issues raised.

When implementing the community involvement plan, the need for a continuous communications link with various segments of the community cannot be overemphasized. Some milestones in the planning process cannot be passed without first reaching corresponding milestones in the community involvement program. Four of these milestones are set forth in the following discussion to illustrate this point. These are the minimum "interface points". In all but the simplest of projects, additional critical "interface" points should be contemplated.

MILESTONE 1: THE STUDY PLAN

Information about the project and staff assignments for the study should be made known to the community as early as possible. The study plan includes most of the basic information which the community needs in order that its citizens might actively participate in the planning effort. As soon as the study plan has been developed, the activities and staff assignments outlined within the document should be followed to disseminate and obtain information.

The following kind of information should be provided to the broadest feasible range of community interest groups:

- a) a description of the proposed project;
- b) the team's goals and objectives for the project;
- c) the disciplines represented on the team and their respective area of responsibility;
- d) a description and schedule of the overall planning process;
- e) a description and schedule of the plan for community involvement in that process.

MILESTONE 2: THE SYNTHESIS OF PRELIMINARY RESEARCH FINDINGS

After the initial studies of the assigned problem have been completed, some of the key planning and design issues will have been identified. The findings should be made known to the community by use of news letters and releases to media, meetings with local officials and interested citizens. This will then help to identify the complete range of corollary issues early enough to allow the team to respond to them.

At this point, the team and the public should understand that the technical reports are tentative. Impulsive rejection of ideas, either by citizens or team members, is discouraged. The objective is to generate discussion of a broad range of alternatives for subsequent evaluation.

"Obtaining information" activities can very well start before this milestone. In all probability, data will have already been solicited from the community in many instances (i.e. conducted a community survey or interviewed community leadership). Milestone 2 is the latest allowable date for soliciting information from the community. Throughout the remainder of the planning process the team should be prepared to accept information from people in the community on a continuing basis.

MILESTONE 3: DEVELOPMENT OF ALTERNATIVES

The development of alternatives is one of the most creative tasks in the planning and design process, and at this point, interaction among team members and the community is very important. (See Guidelines for Interdisciplinary Teams). The contribution of the community is also very helpful. Members of the community may introduce additional factors to consider and can assist in limiting the range of potential alternatives.

At this point in the planning process, the alternatives have not been evaluated in detail. Therefore, the community should not be encouraged to accept or reject any specific alternatives. Such premature "popularity polls" should be avoided.

MILESTONE 4: PLAN REFINEMENT

The evaluation of alternatives should be shared with the community by various methods including information and materials and meetings. This evaluation should include the analysis of impacts and the reasons for eliminating some alternatives from further consideration. A number of techniques have been established for evaluating alternatives.

Persons who previously have not been involved in the planning process will attempt to play a major role in selecting alternatives and refining the plan. Individual citizens must be free to represent their own special interests. However, no interest group should be allowed to dominate another. If the overall public interest is to be honored, the broadest possible range of interests must have a forum.

Refinement of the project plan will require the rejection of some alternatives. It is not always possible to convert all planning decisions into a simple selection from among three or four alternatives. Even so, to the extent feasible, the community should be involved in selecting alternatives and suggesting measures to reduce the attendant adverse impacts.

ACTIVITY

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1974: Inventory Analysis of Impact
 1975: Inventory Report, Responsible Alternatives of Impact
 1976: Circulate Draft E.I.S. Design Hearing
 1977: Final Access E.I.S. Hearing

COORDINATION WITH LOCAL GOVT AGENCIES

Inventory of gov't agencies
 Determine contacts
 Coord. w/ local gov't agencies
 Coordination with agency heads

DISSEMINATION OF INFORMATION

Initial news release
 Press letters
 Prop in centers
 List of E.I.S. presentation

PRESENTATION TO TEAM

Estab. com. involve.
 Identify appropriate agencies

Private E.P.A. present.
 Governmental organ.

ADVISORY COMMITTEE

Advt. adv. committee
 Meetings
 Presentation

HEARINGS WORKSHOP & HEARING

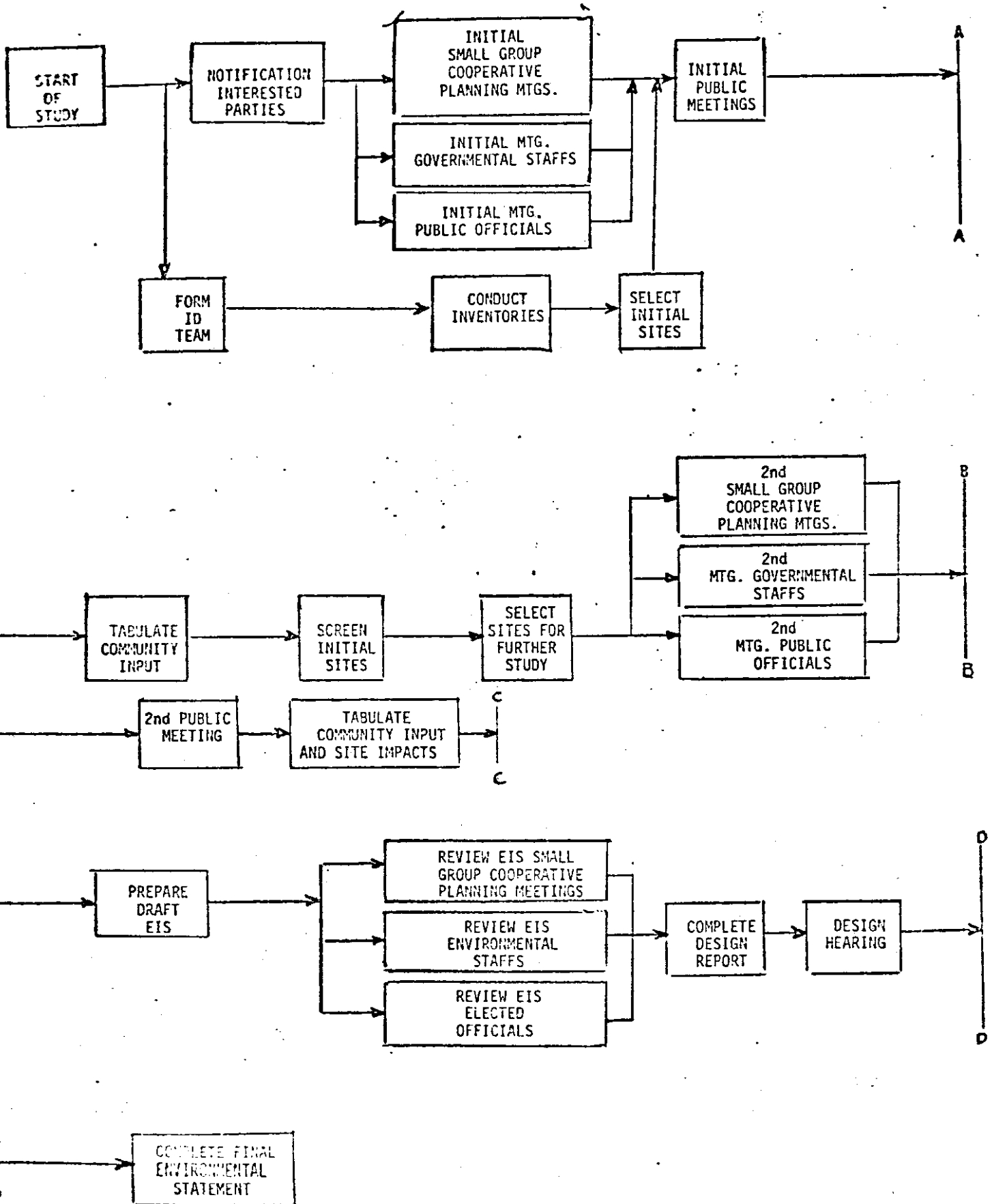
Public workshop
 Design hearing

RELATIONS AND STRATEGIES

Attitude survey
 Public hearing
 Public relations

SR 509 TAC. LOOP
 COMMUNITY
 INVOLVEMENT
 FLOW CHART

PARK AND RIDE COMMUNITY INVOLVEMENT WORK FLOW



PART III

GENERAL METHODS OF IMPLEMENTING THE COMMUNITY INVOLVEMENT PLAN - ADVANTAGES AND LIMITATIONS

In formulating and implementing the community involvement plan, the team should select that combination of methods and techniques most appropriate (a) to each particular community, (b) to the objectives of the plan and (c) to the nature of the project. To a large extent, successful implementation of the plan will depend upon how astutely methods and techniques are selected. This section discusses general methods successfully used by teams in this state. Any method or technique which can facilitate community involvement is worth consideration even though it may not be included here.

Based upon the experience of planning teams, each method has been evaluated with respect to the following criteria:

- a) utility in achieving planning objectives;
- b) record of reliability; and
- c) organizing potential in support of continuing community involvement throughout the entire planning process.

Potential disadvantages of each method, the various difficulties, common errors and disproportionate costs, as experienced in the past are also noted.

General methods are categorized by the primary function: giving information, getting information, and cooperative planning.

Some methods may serve all three functions to some degree. However, no single method is adequate in most cases. A combination is nearly always necessary in order for all three elements to be included in the community involvement program.

All three of these elements are essential, a fact that is often overlooked. Effective cooperative planning between the community and the team must be supported by strong communication links. Therefore, even though greater emphasis and effort on cooperative planning is appropriate, methods of giving and getting information are presented first.

1. METHODS FOR GIVING INFORMATION

A wide variety of techniques enhance communication between the department and the community. The basic communication approach should be to prepare basic background information which gives citizens the who, what, when, why, and how of the proposed project. These basic messages can then be "packaged" in various ways for various purposes, and differing media and other communication channels. Five techniques to give information are the use of (a) conventional mass media, i.e., newspaper, radio, television; (b) direct mail or handout materials, i.e., newsletter and brochures; (c) a drop-in information center; (d) shopping center or public building display center; (e) a speakers bureau; and (f) public meetings.

a. Conventional Mass Media:

In addition to team-produced news releases, team-initiated news media, prepared feature articles and programs can promote positive communication and greater understanding. Newspaper-conducted polls, and radio and television "call-in" programs involving listeners can also be undertaken. In some cases, audio and video information tapes can be prepared for free public service use on radio stations and cable television which have local program origination capability. The use of newspaper polls will be discussed later.

Advantages:

- (1) Reaches the widest possible audience.
- (2) Permits communication of many types of information in a variety of forms and formats.
- (3) Relatively time-efficient.

Disadvantages:

- (1) Circulation (or listening area) may not coincide with project's community of interest.
- (2) Limited possibility for feedback from the community. (However, feedback letters, phone calls and call-in responses should be requested and encouraged.
- (3) May be costly if media management is unable or unwilling to provide as a public service.

b. Direct Mail, Newsletters, and Brochures:

These can be quickly prepared using the basic information, perhaps in question and answer format, and inexpensively printed. They may be sent to either a representative sample, specifically "targeted" mailing list, or to a complete list of the community. They provide informational materials on a regular or intermittent basis. Voter registration, utility billing, and city directories are a good source of addresses and are usually available. In some cases, other sources may be more appropriate. If it is not feasible to "saturate the area", then interest groups, service organizations, and public and private institutions might be asked for help in distribution.

Advantages:

- (1) Provides more direct personalized communication than does mass media, yet reaches a relatively large audience.
- (2) Can include survey forms and polls and otherwise facilitate feedback.

Disadvantages:

- (1) May be costly and time consuming; difficult to manage if departmental public affairs support not requested.
- (2) May have limited utility for direct community involvement except as it may stimulate initial community interest.
- (3) Difficult to determine effectiveness since there is a danger that recipients will resist "junk mail".

Evaluation of community surveys indicates that those who do receive and read such newsletters are better able to meaningfully contribute to the planning process. The quality and "attractiveness" of the newsletter is vital to its effectiveness.

c. Drop-in and/or Display Centers:

A manned or self-explanatory display center at a highly visible location in the community, such as a shopping center, can use photographs, scale models, and graphic representation to illustrate the project, the design problem, possible alternatives, and other significant information. It is important to keep the display up to date at all times. The display center technique is enhanced if located in an enclosed space giving it a "drop-in" center character. People visiting the center should be

encouraged to register; to request inclusion on the mailing list; and to submit written questions, suggestions, design ideas, or other comments about the project and the community involvement program. Utility of the drop-in center can be increased by manning it periodically with a person qualified to discuss the project, and who can provide supporting printed information handouts.

Advantages:

- (1) Demonstrates to the citizens the department's interest in informing the community and gaining community involvement.
- (2) Attracts persons who may not be as easily reached by other means.
- (3) Is convenient for conveying visual information.

Disadvantages:

- (1) An appropriate location is often unavailable when needed.
- (2) Requires time, cost, and management attention to set up and maintain.
- (3) It is difficult to keep the center open during peak demand periods and to keep exhibits and displays timely.
- (4) Manning the drop-in center with qualified persons is difficult because their time is valuable and they are reluctant to work at jobs which entail periods of inactivity.

d. Speaker's Bureau:

In nearly every community, local service clubs (such as Chamber of Commerce, Kiwanis, Lion, Rotary, etc.) are interested in obtaining speakers for

weekly luncheon meetings. Usually, the club books meetings for as long as a year in advance. However, substitute speakers are frequently needed. By contacting the program chairman of local service clubs, team members may gain invitations to speak. The team should seek out a broad range of interested organizations; women's organizations, neighborhood associations, ethnic groups, and others.

Advantages:

- (1) Provides a captive audience for presenting new ideas, recruiting further community involvement, and generally making known the team's assignment to the community.
- (2) Is an efficient means for reaching selected interest groups.
- (3) Is cost-efficient.

Disadvantages:

- (1) There is little control over the timing and subject matter.
- (2) Can burden team members if overdone.
- (3) If no speaker can be made available (on short notice, for example) the team may lose credibility.

Techniques for Improving the Effectiveness of Direct Communications:

The art and science of communications is far too broad a subject to be covered here. Most professionals in the public policy planning arena realize the need for effective communication techniques. Well conceived, written, and illustrated information materials explaining critical issues are essential to the community involvement program. In dealing with the mass media, the team should be candid. What may not seem like important project information from the team's standpoint may appear very newsworthy to the reporter or editor, who is trying to see the

story from the reader's view. Conversely, the mass media may not always be interested in the day-to-day operations of the team. Most reporters, editors, and news directors will be receptive to receiving project information and will give details on news releases, deadlines, and printing public service items. The team should meet and know the community news media people personally and maintain a continuing channel of communication. Encouraging and supporting editors and news directors to prepare a series of feature articles or programs on the project will help assure both media and community continued interest in the planning process.

2. METHODS TO OBTAIN INFORMATION

There are numerous methods of obtaining information, among these are non-personal methods such as newspaper polls and mailed questionnaires, and personal methods such as interviews of individual citizens or key leaders, household surveys (home interviews) and group administered questionnaires without surveys. Appropriate news releases to both announce and then report survey results will help support the survey process and increase community awareness and involvement.

a. Newspaper Polls:

A wide variety of information can be obtained from the results of local newspaper polls. However, such polls are usually limited to questions allowing only a simple "for" or "against" response.

Advantages:

- (1) Relatively inexpensive and quick.
- (2) May aid in gaining the interest of the mass media in the project.
- (3) Informs the public that something is going on and that the team is interested in public opinion.
- (4) The anonymity of the respondent may facilitate responses.

Disadvantages:

- (1) Relatively inflexible and must be limited to a few specific and clearly understood questions.
- (2) The context of the answers is not known; even the most clearly stated question may be misinterpreted by the respondent.
- (3) Experience indicates a relatively low rate of response.
- (4) Neither the universe of those receiving the poll nor the sample of respondents is known. (However, if the poll includes information on the characteristics of the respondent, including general location of residence, such information may be related to census data. This may provide some measure of sample bias.)

b. Mailed Questionnaires:

When it is feasible to compile a large mailing list, an extensive questionnaire soliciting attitudes and opinions on community values by sub-areas of the community may be mailed.

Advantages:

- (1) Is relatively quick.
- (2) Anonymity may facilitate more candid answers.
- (3) The sample is specified, therefore data obtained can be integrated with information from other sources.

Disadvantages:

- (1) Direct cost and management time is greater than for newspaper polls.

- (2) Extensive phone and mail follow-up may be required in order to secure an adequate number of timely responses.
- (3) The "no response" bias is not easily measured.

The statistical reliability of this type of survey can be checked by conducting home interviews of a selected sub-sample. When this technique is used, the largest sample group is sent a more detailed questionnaire and a yet smaller number are given extensive, indepth, structured interviews. By use of statistical analysis, each set of questionnaires is related to the next larger sample and finally to the universe.

c. Survey of Professional Personnel:

"Professional personnel" includes those persons having knowledge on a specific subject related to transportation planning. Surveys of such persons can be either in the form of a single structured interview or a systematic continuing contact. Selection of respondents is a critical problem because opinions and attitudes of the select group may diverge widely from those of the rest of the community. For this reason the technique should never be used as a principal method for community involvement.

Advantages:

- (1) Is relatively more efficient than broader-based surveys.
- (2) Often provides a relatively dependable articulation of community values and of highway-related community development problems.
- (3) Usually alerts team to politically sensitive local issues.
- (4) Extends the team's opportunities for personal contact with

the community and for disseminating information about the project.

- (5) Permits elaboration of questions and probing for answers.

Disadvantages:

- (1) Requires careful selection in order to assure a cross representation of leadership. Experts are difficult to identify when representation leadership is a major criteria.
- (2) Requires continuing systematic structuring of communication.
- (3) Subject to criticism from interest groups not adequately or appropriately represented; "elitist" bias is a real danger.
- (4) There is no completely satisfactory way to quantify the opinion of experts.

Experts tend to be leaders who can keep the team in touch with the community issues. However, leaders tend to over-estimate support for programs of which they are a part.

d. Community Survey (Drop Off/Pick Up):

During the past two years the Department of Highways has had considerable success with community surveys. While the Department has perfected sampling techniques and questionnaire format, the team must determine the more specific issues to be addressed. The team should have one of its members design the survey form and coordinate the survey with Departmental personnel.

Advantages:

- (1) Helps inform the public on the planning issues.

- (2) Provides for a broad representation of community opinions.
- (3) Provides further information on local transportation requirements.
- (4) Provides descriptive information about the structure and demographic characteristics of the community. Results may, in turn, be used to facilitate public discussions.
- (5) Has good rate of return.

Disadvantages:

- (1) Requires considerable management effort and is more costly than polls.
- (2) Takes considerable time to design, conduct, and analyze.

The citizen surveys have proved to be extremely useful to those responsible for preparing environmental impact statements. They have provided otherwise unavailable information to the Department. One by-product of each survey has been the direct delivery to each household within the sample of information about the work of the team and about some of the planning issues relative to the project. The technique has also improved communication. Finally, surveys have proved to be effective means for obtaining community-wide citizen input.

3. METHODS OF COOPERATIVE PLANNING

Effective community involvement requires cooperation and interaction between the Department and the community.

a. Committees:

Among the first attempts to broaden community involvement is the formation of ad hoc committees to advise public decision-makers. Four types of committees have been used extensively in highway

planning practice: 1) policy committees consisting of state and local or other public officials; 2) technical committees composed of state and local technical personnel; 3) citizen committees of varied composition; and 4) combined committees composed of citizens, policy makers, and technicians. Each of these types of advisory committees has advantages and disadvantages.

Policy Committees

Advantages:

- (1) Demonstrate involvement of local interests.
- (2) Are able to identify politically unacceptable solutions.
- (3) Has considerable knowledge of local conditions.

Disadvantages:

- (1) Membership changes as terms of political office expire, causing problems of authority and/or lack of continuity in committee activities.
- (2) Members may consider their appointment an "honor" requiring no commitment to engage in any meaningful activity or planning decisions.
- (3) Some members may put special interests ahead of project objectives and the general public interest.
- (4) Members are representatives of their constituent jurisdictions, and are unable to express policy or to recommend decisions without prior action of the agencies they represent.

Technical Committees

Advantages:

- (1) Understand technical problems and need only a general briefing as a requisite to meaningful contributions.
- (2) Have a considerable knowledge pertinent to solutions.
- (3) Demonstrate involvement of local governmental interests.

Disadvantages:

- (1) Members should not recommend policy without prior clearance from their respective employer agency (often unobtainable).
- (2) Do not represent the broader public interest; e.g., little better qualified to express local community values than members of the team.
- (3) By their nature are not representative of the general citizenry.

Citizen Committees

Advantages:

- (1) More readily structured to assure representation from those groups most affected by the project, as well as to create a micro-cosm of the area.
- (2) May have greater credibility with the public than "politicians" or "bureaucrats" would have.
- (3) As public service volunteers, members may work harder.

Disadvantages:

- (1) As volunteers, some members may not have the time required to meet planning schedules.

- (2) May represent interest groups and be unable to express policy position without prior clearance. (For this reason it is better to have selection based upon their membership in the interest group and not be official representative.)

Combined Committees

Advantages:

- (1) Provides simple but effective structure for coordination of various interests in community.
- (2) Provides a structure for more extensive interaction among citizens, policy makers, and professional personnel than most other methods.
- (3) Confusion that sometimes exists in multiple committee structure is reduced since various matters can be explained by committee members without additional coordination.
- (4) Saves time and reduces cost compared to use of multiplicity of committees.

Disadvantages:

- (1) Limits number of interested persons who can participate compared to multiple committee structure.
- (2) May deter citizens or technical personnel from providing and expressing opinions as openly as when discussion is among persons with similar concerns.

In selecting committee members, a special effort should be made to include all segments of the community. This can be usually done by requesting

organizations and institutions most likely to be found in the community to submit names of representatives. Such institutions or groups include the following:

- (1) Governmental units including city, county, and any special districts having a direct interest. This includes elected officials and staff administrators or technicians.
- (2) Religious and fraternal organizations.
- (3) Labor.
- (4) Industry.
- (5) Commerce.
- (6) Agriculture.
- (7) Education.
- (8) Disadvantaged and minorities.
- (9) Environmental groups.
- (10) Transportation interests.
- (11) Planning organizations.
- (12) Public safety including police, fire, and health.
- (13) Civic groups not previously included, such as League of Women Voters or Senior Citizens Council.
- (14) Arts and/or recreation associations.
- (15) Neighborhood associations and community councils.

In some cases, interests can be identified for which there exists no organized institutional support. Securing a representative from each recognized group may not be sufficient; some effort may have to be given to make sure unorganized minorities have adequate representation. One way of identifying latent leadership is to seek out the advice of

elementary school principals, local ministers, and others having a broad acquaintance with the general public.

When committees are appointed from organized groups and institutions, it must inform them that they are not considered to be official representatives of their respective groups. Otherwise, many may be unwilling to express opinions or attitudes or to take any position on issues without first consulting their constituent group. This can seriously delay the committee's operations. Each committee member should give his own opinion. Potential committee members should be told that membership in a particular interest group is considered evidence of an important interest in some phase of the community. Also, the identification of certain committee members as official representatives of interest groups may constrain interaction. Furthermore, others of the represented group may feel that the appointment does not constitute a valid representation of the group's interests.

Increasing the Effectiveness of the Committee

A committee provides means for departmental personnel to interact with important representatives of the community. The committee must be given meaningful assignments. Participation will either decline or become ineffective if members are not given significant tasks to accomplish and recognition for their contributions. The Department should be prepared and noticeably willing to serve its committee in the following ways:

- (1) Provide the staff support required for scheduling and conducting committee meetings and activities including preparation of meeting notices and agenda, recording of minutes and distribution of material aid, etc.

- (2) Provide information systematically and dependably to enable committee to intelligently analyze the problem and suggest solutions.
- (3) Provide some means through use of such techniques such as group discussions, questionnaires, and maps by which committee members can contribute at each meeting and feel that their time is being well spent.
- (4) Demonstrate the value of committee contribution by acknowledging usable data and problem solutions, and outline the procedures by which committee input will be considered in the decisionmaking process.
- (5) Help the committee sponsor and conduct community forums, workshops, and other meetings.
- (6) Recognize the committee chairman and other members at public meetings and urge committee members to assume active roles such as serving as chairman of meetings, presenting information, etc.
- (7) When decisions are made by policy-determining bodies, inform committee members of such action and the reasons why such decisions were reached. Nothing is more discouraging than to spend time studying a problem and then never knowing how committee reports were used by decision makers.

COORDINATING METHODS

It cannot be overemphasized that several methods and techniques should be used to implement community involvement plans. To the extent feasible, each method (or event) in the program should include some reference to previous and/or future events. For example, public meetings and newsletters can be used to recruit committee members.

Citizens expressions of opinions, attitudes, and preferences should always be facilitated. People should be offered various opportunities to respond to project plans. Polls, surveys, and workshop discussions should be designed to give participants an opportunity to answer such questions as:

"Have you had an opportunity to participate in planning activities in (Your community) before?"

"Are you interested in participating in the planning for the new highway by: Receiving the newsletter? _____ Serving on a committee? _____ Attending the next workshop? _____"

"Have you read the newsletter? If yes, do you find it worthwhile?"

"Did you attend the workshop at the High School in May? If so, did it help explain the issues to you?"

"Would you like to be placed on the team's mailing list? If your answer is "yes" to any of these questions, please give your name, address, and telephone number."

Answers to such questions will help the team coordinate methods of involvement and evaluate their effectiveness.*

The Public Meeting

To many, community involvement is synonymous with public meetings in which citizens can hear about the projects, express their opinions on the issues involved, and support solutions. Experience has cast some doubt on the utility of public meetings as the sole basis for community involvement. Nevertheless, such meetings are an important component of most successful community involvement programs.

*Evaluation methods are discussed in Part IV.

Advantages:

- (1) Is recognized by the public as an opportunity for participation.
- (2) Provides opportunity to present and obtain information.
- (3) Gives potential project proponents or opponents a chance to state their feelings.
- (4) Gives the team, as a group, an opportunity to present its findings and recommendations.

Disadvantages:

- (1) Special interest groups may dominate discussion and intimidate the average citizen.
- (2) Persons able and willing to attend and participate in public meetings are usually not a representative sample of the community's total population.
- (3) Such meetings sometimes polarize public opinion "for" and "against" the project.
- (4) Participants often dwell on extraneous issues and ignore vital ones.
- (5) Generally public meetings have limited utility for obtaining information from the community pertinent to the planning issues or for facilitating cooperative planning activity.

Improving the Effectiveness of Public Meetings

Experience in highway planning has demonstrated that the most effective meetings are those carefully planned to involve the participants. While the structure of the meeting may vary, four factors are critical: 1) the staff must describe the project and its attendant community issues clearly and

concisely; 2) there must be ample opportunity for participants to discuss various matters and to ask questions; 3) assurance must be given that any unanswered questions will be further investigated; and 4) the team should demonstrate that each participant's contribution has been recorded and that his attitudes, opinions, and questions will be duly considered.

In conducting the discussion session, team members or others responding to questions should not engage in lengthy philosophical discussions. If a satisfactory answer cannot be expressed by a very brief statement, it should be deferred until a subsequent public statement can be distributed. The staff must not openly debate participants of differing opinions. If one member should try, the chairman should immediately cut him off, saying: "We certainly will have to consider that issue more seriously". Neither should the team try to sell its own concepts or ideas at public meetings. It should give the participants a sound basis for evaluating the significant planning issues.

If the audience is large the following technique is suggested. All questions are recorded on a blackboard before any are answered. The chairman can then organize the questions into logical categories and eliminate the redundancies. While doing so, he should explain his thinking and ask the audience for its opinion. This exercise not only will help the team to formulate its answers but will also help the participants to analyze the relationships between design factors and community issues. Citizen participation in a public meeting should involve more than asking questions of the chairman. All participants should be encouraged to answer questionnaires, if not too long or complicated, and to direct written questions or comments to the whole team or to a particular member.

Workshops

A public workshop is one of the better formats for allowing the team to demonstrate the complexities of the problem and to explain the critical issues. The workshop procedure which has proved to be most useful by Department of Highways and other organizations is as follows:

- (1) Brief factual presentation.
- (2) Form small discussion groups (6 to 10 persons)
- (3) Each group selects discussion leader and spokesman.
- (4) Discussion directed toward two or three basic questions predetermined.
- (5) Team member serves as recorder and facilitator.
- (6) Spokesman for each group reports conclusions of group.
- (7) All persons attending meeting complete questionnaire so views of each person can be obtained.
- (8) Open discussion by all members at meeting.

Advantages:

- (1) Permits direct participation of citizens in the problem-solving process, giving them a better understanding of the difficulty of finding feasible alternatives.
- (2) Facilitates accommodation among opposing special interest groups.
- (3) Stimulates direct interaction between citizens of the community and team members.

Disadvantages:

- (1) Requires more pre-planning and preparation than a general meeting.
- (2) May permit only relatively small groups because large groups are difficult to accommodate unless special meeting facilities are available.

Public Hearings

Because the legally required public hearing has the disadvantages common to most public meetings (see p.33)it has been highly criticized by most practitioners of community involvement, but it does serve several useful purposes. The hearing is held when the team has already outlined alternative courses of action and is ready to recommend its preferred route. However, the general public has come to recognize the public hearing as one of the major opportunities to obtain information about the details of the projects proposed and to give their views to decision makers. Therefore, the public hearing format should provide opportunities for citizens to ask questions, receive answers, and generally speak their minds.

PART IV

EVALUATION OF TEAM'S EFFORTS AND EFFECTIVENESS

How effective were the efforts of the team in bringing about community involvement on the project? What techniques and methods of community involvement were productive? Were team members benefitted? Did community involvement help them to do a better job of planning? In what ways? Does the process of community involvement result in better "solutions" to the transportation needs of the community? Does it result in better working relations for the District Engineer and his staff and for the interdisciplinary team? Does it result in greater satisfaction for the citizenry of the community?

These are some of the important questions which the team should ask itself when evaluating its community involvement program. The planning process is a continuing one; the team should view its current assignment as just one of many for which community involvement will be required. Furthermore, the current project may entail the team's first systematic, monitored involvement of citizenry in transportation planning. Team members will be greatly aided in future assignments if they collectively and individually assess this first effort with care. It may or may not be necessary or even desirable to formally evaluate every subsequent community involvement program. However, criteria for evaluating such programs are useful for planning and implementation purposes even if the criteria are not used for evaluation purposes.

HOW TO EVALUATE

The basic strategies of evaluation discussed below are self-evaluation and staff review. The team both individually and collectively should rate (a) the quality of the team's efforts, and (b) the effectiveness of the community involvement plan.

The individual ratings are valuable because they reflect the unique experience of each member in the planning process. The ratings may vary with the degree of responsibility each member had to implement the community involvement plan, and with the methods and techniques he used. Collective ratings are valuable because they provide a comparison with the individual ratings.

Individual ratings require that each team member describe his efforts to achieve community involvement in the tasks assigned to him. This report identifies techniques for community involvement in Part II. These are represented in Chart 1. Four major stages or "milestones" in the planning process are identified in Part II. At each stage, community involvement is needed. These are represented in Chart 1.

This chart serves as a checklist which enables the team member to report the full range of activities he engaged in during the implementation of the Community Involvement Plan. It describes what he did, with whom, at what times, etc. It details his efforts toward community involvement.

Each team member should judge the advantages and disadvantages of citizen involvement during his phases of the work. He is also asked to evaluate the satisfaction of the citizenry with the methods and the results obtained. The team member's report on this phase of his work can be guided by the questions set forth in Chart 1.

Collective Ratings

A Collective Rating System is the second procedure for evaluating the effectiveness of the total community involvement effort. The collective assessment is derived partly from a synthesis of the reports of the separate team members

CHART 1 - Rating of Effort Spent in Implementation
of Community Involvement Plan

Techniques of Community Involvement

Milestones or Stages of Community Involvement	Mass Media	News-letters & Brochures	Public Meetings & Workshops	Surveys & Questionnaires	Committees	Other
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A. Organization of the Community Involvement Program

B. Preliminary research findings of problems and conditions.

C. Development of "alter-native" solutions

D. Refinement of Plan; making decisions about Plan alter-natives.

and partly from a comprehensive evaluation of the effectiveness of the team in meeting the goals of the Community Involvement Plan.

Implementation of the Community Involvement Plan (Directive D 31-18) requires six types of activities:

1. Providing the public with information about the transportation problems and plans to correct them;
2. Involving local government officials in planning and decision making;
3. Obtaining the views and opinions of citizens and their leaders including both those who will benefit and those who will suffer as a result of the project;
4. Assessing the values, goals, and attitudes of residents affected by the transportation project;
5. Maintaining a continuous liaison with representatives of the community to assure the flow of ideas and views; and
6. Identifying, reviewing and considering the community input in the decision making process.

Interdisciplinary teams should prepare a statement appraising the success had in achieving these objectives collectively. This statement should not include what the individual members of the team say they did and how well they did it, although such a summary is an integral part of the collective appraisal. The collective appraisal should also allow the team member to evaluate the work of his peers, and the work of the entire team. The review of the individual team members reports plus the comparison of the project activities with the stated objectives of the Community Involvement Plan, offers a good opportunity to realistically assess successes and failures, to discover omissions or needless duplications and to discover ways of developing better programs of community involvement in the future.

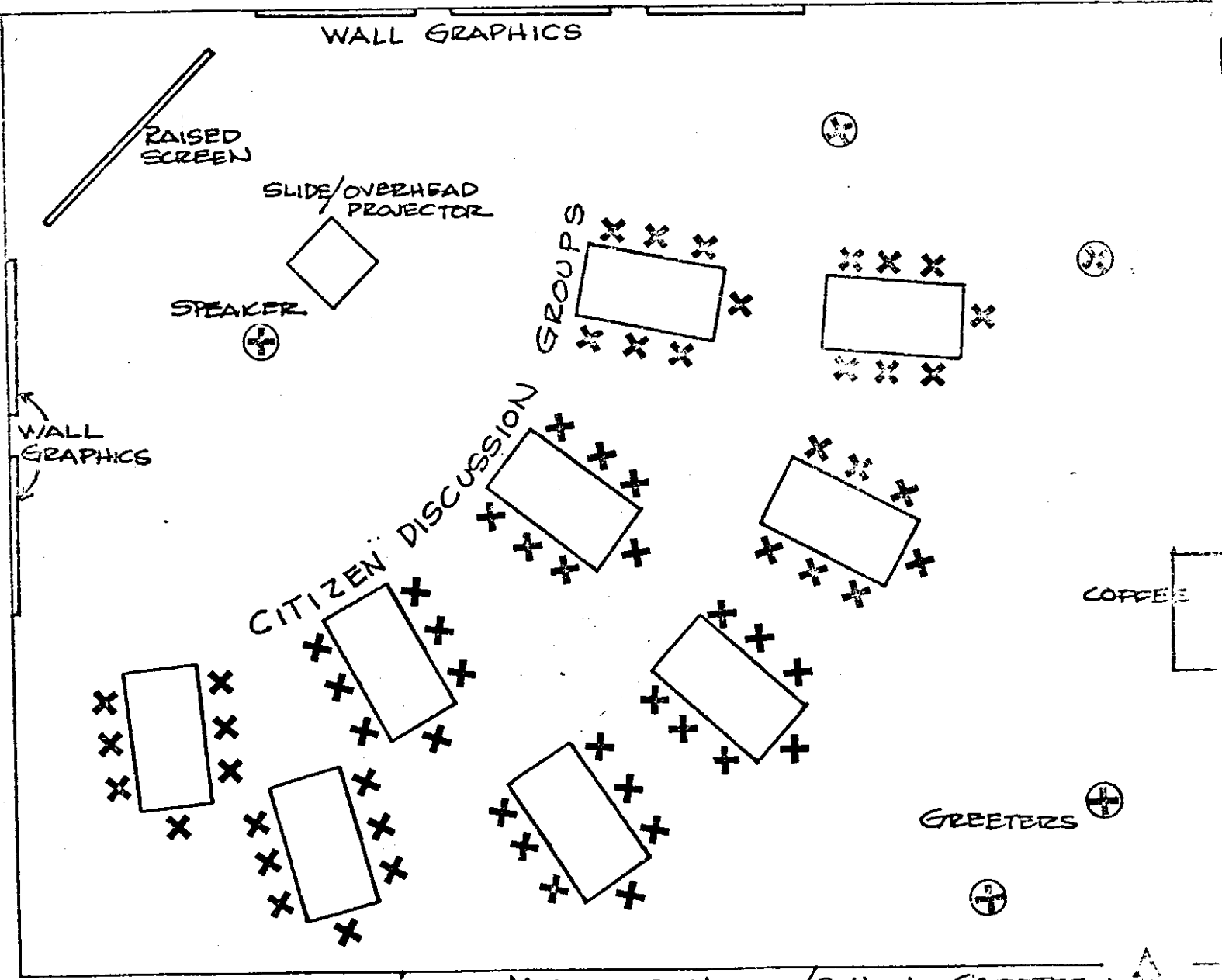
V. Appendix

CATALOG OF COMMUNITY INTERACTION TECHNIQUES

COMMUNITY INTERACTION TECHNIQUES			
INFORMATION GATHERING	INFORMATION DISTRIBUTION	INTERACTION	SPECIAL PURPOSE
<p>EXISTING SOURCES COMPILED STATISTICS DESCRIPTIVE INFORMATION</p> <p>WORKING WITH LOCAL OFFICIALS</p> <p>MONITORING NEW DEVELOPMENTS</p> <p>ANALYZING PLANS, PROGRAMS, AND REPORTS</p> <p>MONITORING MASS MEDIA NEWSPAPERS RADIO AND TELEVISION OTHER MEDIA</p> <p>FIELD WORK</p> <p>SURVEYS</p>	<p>POSTERS, BILLBOARDS, AND SIGNS</p> <p>MAIL NOTICES, BROCHURES, NEWSLETTERS, FLIERS</p> <p>NEWSPAPERS LEGAL NOTICES ADVERTISEMENTS NEWS ARTICLES FEATURE COLUMNS AND ARTICLES NEWS RELEASES LETTERS TO THE EDITOR</p> <p>RADIO AND TELEVISION ANNOUNCEMENTS NEWS COVERAGE TALK SHOWS AND COMMUNITY ORIENTED PROGRAMS DOCUMENTARIES</p> <p>COMMUNITY ORGANIZATIONS DISPLAYS, MAPS, MODELS</p>	<p>SMALL GROUP MEETINGS</p> <p>WORKING MEETINGS</p> <p>WORKSHOPS</p> <p>HEARINGS AND OTHER LARGE PUBLIC MEETINGS</p> <p>FIELD OFFICES</p> <p>PUBLIC INFORMATION CENTERS</p> <p>ADVISORY COMMITTEES, STEERING COMMITTEES, OTHER GROUPS</p>	<p>REFERENDA</p> <p>TECHNICAL ASSISTANCE</p> <p>MEDIATION AND ARBITRATION</p> <p>OMBUDSMAN</p> <p>CHARENTE</p>

FORMAT 1

COMMUNITY WORKSHOPS

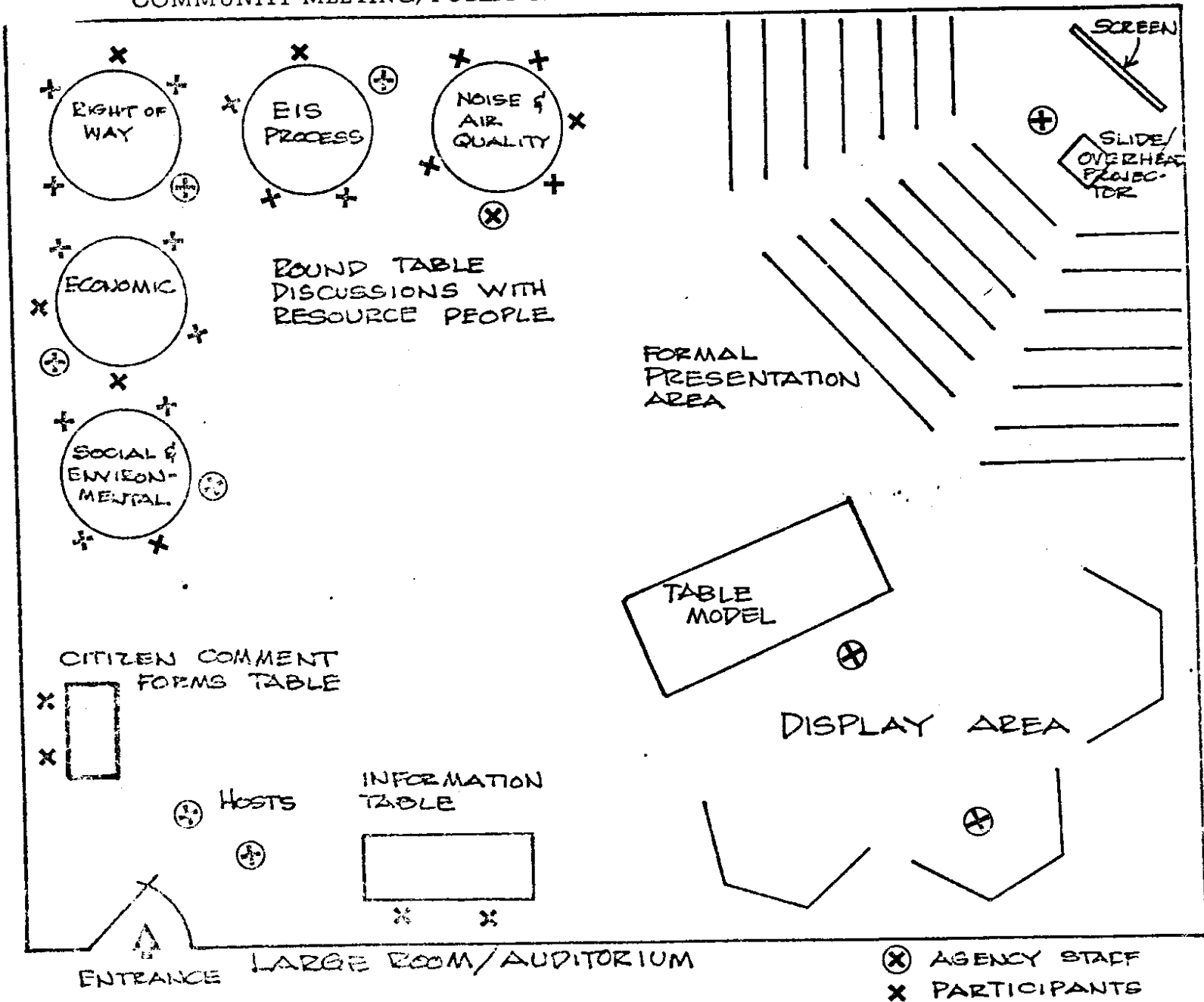


- ⊗ AGENCY STAFF
- X PARTICIPANTS

MEETING HALL/SCHOOL CAFETERIA

FORMAT 2


COMMUNITY MEETING/PUBLIC HEARING



DEPARTMENT OF HIGHWAYS

DIRECTIVE

NO. D 31-18 (PP)


Assistant Director for
Planning, Research

Effective Date:
May 7, 1974

COMMUNITY INVOLVEMENT IN PROJECT DEVELOPMENT

I. INTRODUCTION

A. PURPOSE:

To provide guidelines to implement the Action Plan by establishing and implementing comprehensive community involvement programs that meet the specific needs of various types of projects.

B. SUPERSESSION:

IL 31-18 (PP), "Community Involvement"

C. REFERENCES:

1. M 31-10 (PP), "Action Plan"
2. PPM 90-4, "Process Guidelines (Social, Economic and Environmental Effects on Highway Projects)"
3. D 31-12 (PP), "Interdisciplinary Approach to Project Development"
4. D 22-52 (HR), "Public Hearings".
5. D 22-52.1 (HR), "Public Hearing Procedures".

D. DEFINITIONS:

1. Community Involvement: The process that includes the participation in transportation planning and design of all segments of the public; elected and appointed officials, private citizens and organized groups.
2. Public: The people as a whole, the community at large. The public is the generalized concept of community because the action or inaction of governmental agencies affect virtually all individuals, groups and institutions.

3. Community Involvement Plan: A plan which identifies the specific objectives, activities, and techniques to be utilized to involve the public and assigns responsibility to undertake these activities.

II. RULES

A. GENERAL

The Department of Highways seeks the participation of the public and of other agencies in the development of transportation projects to achieve viable solutions to transportation problems that reflect the values and desires of the public. To be effective, community involvement programs that are devised and implemented must be meaningful for citizens and those agencies charged with providing satisfactory transportation services.

B. REQUIREMENTS AND RESPONSIBILITY FOR THE PREPARATION AND APPROVAL OF A COMMUNITY INVOLVEMENT PLAN.

1. A community involvement plan which includes activities to be undertaken and the assignment of responsibility to undertake such activities is required for all Group 1 and 2 projects. (See D 31-12 (PP), "Interdisciplinary Approach to Project Development".) For Group 1 projects, the plan is prepared by the Interdisciplinary Team member(s) appointed to the Team for that purpose and is then reviewed and adopted by the entire Team. For Group 2 projects, the plan is prepared by an Interdisciplinary Team member if an Interdisciplinary Team is appointed, or if no formal Team is established, by a District staff member assigned by the District Engineer. For Group 3 projects, a formal community involvement plan is not required. However, action must be taken to inform the public of the need for the project, the improvements to be made and methods by which citizens can express their views and receive additional information. District staff members as assigned by the District Engineer are designated to undertake these activities and provide for consideration in the decisionmaking process.
2. The community involvement plan is prepared as part of the Study Plan and will be reviewed and approved by the District Engineer and the Assistant Director for Planning, Research and State Aid if the project is in the location stage of project development, or the Assistant Director for Highway Development if it is in the design stage.

C. DEVELOPMENT OF A COMMUNITY INVOLVEMENT PLAN

The community involvement plan will include specific methods or techniques to achieve the objectives and activities listed below and assign responsibility for performing such activities:

1. Provide information to the public. Information concerning transportation problems, progress of study, means by which citizens can participate, alternative courses of action, findings of studies, decisions reached by policy-determining bodies, and reasons for reaching such decisions and other items should be covered. Techniques especially adapted for this objective include news releases, publications, television programs, film strips, drop-in centers, meetings and/or various other approaches.
2. Coordinate with and involve local governmental officials in studies being undertaken and provide for inclusion of their views in the decisionmaking process.
3. Obtain views and opinions of citizens and their opinion leaders. Provisions will be made by which residents of the various segments of community can express opinions, exchange views, ask questions, and discuss alternative courses of action which might be taken to solve transportation problems. This includes views of minority groups and those who will receive potential benefits and those adversely affected. Provisions for this will be undertaken prior to the hearing for each project. In addition, provision should be made to obtain opinions of a cross section of the community. Various techniques may be used to obtain opinions of citizens but usually several methods are required.
4. Assess values, goals and attitudes of residents of the area affected. This should relate to development of the area in general as well as to factors concerning transportation. These values and attitudes may be determined through such techniques as surveys, goals contained in comprehensive plans, resolutions or statutes enacted by state or local governments, newspaper comments, interviews with opinion leaders, etc. Methods adopted should serve as a means of identifying various groups or individual interests including those who will benefit, those adversely affected and minorities.
5. Maintain a liaison with representatives of the community to assure continuous flow of information and views. Advisory committees, systematic individual consultations, small group meetings with different types of opinion leaders, or other approaches may be utilized.
6. Identify and consider community input in the decisionmaking process. Since decisions must be made at all stages as the project progresses, the procedures developed in the plan will provide means for consideration of public input in project development and by policymaking bodies. A report containing view of citizens, local officials and organized groups obtained through public meetings, surveys, etc., will be made available to decision makers.

D. METHODS AND TECHNIQUES

1. Some of the methods which can be used to involve and advise the public during the project development phase include the following:
 - a. Systematic contact with opinion leaders within the study area;
 - b. Establishment of advisory committees of elected and appointed local officials and private citizens;
 - c. Publication of newsletters or small brochures;
 - d. Location brochures;
 - e. Surveys of desires and attitudes of the public concerning transportation;
 - f. Community meetings and workshops;
 - g. Development of slides and film strips for use in a variety of ways;
 - h. Press, radio and television coverage;
 - i. Development of small groups in neighborhoods or by specific interest;
 - j. Presentation to various service, civic and other organizations;
 - k. Systematic use of community-wide study programs by various groups;
 - l. Drop-in centers;
 - m. Radio and television question and answer programs.
2. A community involvement plan should incorporate a number of different ways in which citizens might receive information and make their desires known. Community involvement programs should begin as early as possible to insure participation throughout the developmental stage. However, care should be taken not to involve the public before sufficient data is available with which individuals and groups can work.

E. IMPLEMENTATION OF PLAN

The implementation of the community involvement plan must necessarily be a joint undertaking between the District staff and the Interdisciplinary Team since various departmental resources will be involved. On Group 1 projects, the Interdisciplinary Team member(s) responsible for plan development will assume a major role in coordinating the

overall implementation of the plan, but the entire Team and District personnel not serving as members of the Team will be involved to the extent required. For Group 2 and 3 projects, the District Engineer will assign responsibility for implementation of the community involvement activities.

**GUIDELINES FOR THE
IDENTIFICATION AND MEASUREMENT OF
SOCIAL FACTORS IN TRANSPORTATION PLANNING**

Prepared by

WASHINGTON STATE HIGHWAY COMMISSION
DEPARTMENT OF HIGHWAYS

In Cooperation with

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

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16. Abstract <p>The purpose of this study is to establish guidelines and procedures for the measurement of the social effects of transportation systems and facilities on both a regional and community or neighborhood level. This coincides with the increased emphasis on human factors in the planning and design of transportation systems and facilities which has necessitated the development of a systematic approach to gathering social data and developing normative standards. In part this increased emphasis has been mandated by Federal statutes such as the National Environmental Policy Act of 1969 and the Intergovernmental Act of 1968.</p> <p>A detailed examination of the seven-fold classification scheme of social factors and an emphasis on the methodologies used to evaluate social impacts is discussed. Emphasis is placed on the analytical framework utilizing the major phases of inventoring existing social conditions, identifying potential changes and measurement of probable impacts. From this analysis a systematic approach to identifying and measuring social impact in transportation planning is put forth, for use by those assigned this responsibility.</p>		13. Type of Report and Period Covered Final-Guideline 10/1/72-6/30/76	
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I. INTRODUCTION

In recent years increased emphasis has been placed upon social, economic, and environmental factors in the planning and design of transportation systems. In highway planning, traditional engineering and physical design factors have heretofore been dominant. The expansion of the number and type of factors which must be considered has brought changes in traditional highway planning practice. Some of these values and changing priorities have been expressed formally in the National Environmental Policy Act of 1969, federal transportation statutes, and the Intergovernmental Act of 1968. All of these federal statutes require that the social impact be assessed and documented in transportation projects. A major problem in actually assessing the impact of highways upon humans and the communities in which they live has been the lack of meaningful social data and normative standards.

A widespread desire exists among professional personnel and the public to improve existing approaches of dealing with these social and environmental issues in the planning, location, and design of transportation systems. Federal regulations require that the following factors be considered:

1. Regional and Community growth including general plans and proposed land use, total transportation requirements and status of the planning process.
2. Conservation and Preservation including soil erosion and sedimentation, the general ecology of the area as well as man-made and other natural resources, such as park and recreational facilities, wildlife and waterfowl areas, historic and natural landmarks.

3. Public Facilities and Services including religious, health and educational facilities; and public utilities, fire protection and other emergency services.
4. Community Cohesion including residential and neighborhood character and stability, highway impacts on minority and other specific groups and interests, and effects on local tax base and property values.
5. Displacement of People, Businesses, and Farms including relocation assistance, availability of adequate replacement housing, economic activity (employment gains and losses, etc.).
6. Air, Noise, Water Pollution including consistency with approved air quality implementation plans, FHWA noise level standards (as required under PPM 90-2), and any relevant federal or state water quality standards.
7. Aesthetic and Other Values including visual quality, such as "view of the road" and "view from the road", and the joint development and multiple use of space.

To the social scientist each of these seven aspects of transportation planning have significant social considerations, but the seven-fold classification scheme does not provide a systematic basis for identifying and analyzing social factors. Among other problems, attempts to classify for purposes of analysis are confronted with conflicts between the regional perspective and that of the neighborhood and/or the community.

The social scientist like the engineer is interested in using more precise objective and systematic methods for arriving at the solution of the highway design problem. However, it must be recognized that the plan, even for the

simplest of facilities, represents the synthesis of several, if not many alternative decisions with respect to the various elements of the project. These decisions ultimately are public decisions which are not always constrained by the discipline which the social scientist and engineers impose upon themselves in applying a systematic approach to planning. Thus people's attitudes and opinions have a direct bearing on the decision-making process. These apply not only to the facility itself but to the relative importance of each of the social, economic, and environmental factors in terms of both the regional perspective and the community/neighborhood perspective.

II. PURPOSE OF GUIDELINES

The purpose of these guidelines is to establish procedures for the measurement of the social effects of transportation systems and facilities and to overcome some of the limitations of the more common current methodology for measuring such impacts. To successfully accomplish this purpose, the transportation project must be conceptualized as an innovation of some magnitude in the life of the area into which it is introduced. It may affect the mobility and communication of the area and its environment. Among other things, it may affect the patterns of social development, legal status, land use and ownership, types of facilities and amenities, access to facilities and amenities, and property values.

III. PLANNING FACTORS

In the long run, meeting the requirements of state and national environmental policy will necessitate a planning effort in which the major objective is to reach the best possible solution to transportation needs and problems among conflicting community values. An important part of the technician's job is to disclose to the best degree possible the advantages and disadvantages of each alternative

TABLE 1
FACTORS IN PLANNING AND IN IMPACT ANALYSIS

- | | |
|-------------------------------------|------------------------------------|
| 1. Acoustics | 17. User Costs |
| 2. Air Quality | a. Vehicle Operation |
| 3. Water Quality | b. Safety |
| 4. Wildlife | c. Time |
| 5. Vegetation | d. Comfort-Convenience |
| 6. Geology | 18. Economic Activity |
| 7. Soils | a. Tax Impact |
| 8. Drainage | b. Employment |
| 9. Governmental Services | c. Trade |
| a. Health | d. Property Values |
| b. Education | 19. Land Use Impact |
| c. Utilities | a. Existing & Projected |
| d. Police & Fire | 20. Comprehensive Planning Process |
| 10. Other Public Institutions | 21. Urban Form & Development |
| 11. Transportation Service to Areas | 22. Community Identity |
| a. Regional | a. Population Trends |
| b. Local | b. Characteristics |
| c. Route Continuity | c. Neighborhood Characteristics |
| 12. Traffic | 23. Displacement |
| a. Regional | 24. Relocation |
| b. Local Circulation | 25. Disruption |
| 13. Design Factors and Standards | 26. Community Cohesion |
| a. Project Traffic | 27. Minority Interests |
| b. Right of Way | 28. Community Values & Desires |
| c. Capacity | a. Area Development |
| d. Geometrics | b. Transportation Values & Desires |
| e. Restraints | c. Perception of Problem |
| 14. Aesthetics | d. Solution of Problem |
| 15. Construction Costs | |
| 16. Maintenance Costs | |

under consideration. This requires adequate attention to the maximum feasible number of social, economic, and environmental factors while still giving primary consideration to the need for fast, safe, efficient transportation at a reasonable cost. Twenty-eight factors in highway planning designed to respond to the federal requirements are listed in Table 1.

The factors list is actually a classification scheme which has been used effectively in the State of Washington for organizing the work of interdisciplinary teams assigned the task of highway project planning. As such, it is not a universal classification applicable to all such projects. Generally speaking, the last seven items (22 through 28) can be classified as "social factors". However, the remaining twenty-one items may have indirect social implications which need to be considered. Operational definitions for these terms are set forth as follows:

Factor No. 22 - Community Identity

Community identity as a social factor refers to what the community is in terms of its people and its institutions. Community identity is measured by historical development including cultural, political, and population trends and the socio-economic characteristics of its current inhabitants.

Factor No. 23 - Displacement

Displacement refers to the removal of land, businesses, housing units, resources and other facilities in order to provide for highway right of way. Displacement of land is measured in terms of area (square feet, acres, square miles, etc.) by some particular use; i.e., agricultural, single family residential, commercial, etc. Displacement of facilities is in terms of structures or units within structures such as dwelling units, business offices, and so forth. In measuring dwelling units, both occupied and unoccupied units should be identified and tabulated separately.

Factor No. 24 - Relocation

Relocation refers to the moving of a family, business establishment or operating farm unit to a new location. Under the provision of the Uniform Land Acquisition and Relocation Act of 1970, the Department must make available both advisory and financial assistance to relocatees. This gives rise to the classification of several types of relocation, as follows:

1. Unassisted relocation wherein the occupants move prior to any formal contract with the Department;
2. Assisted relocation wherein one or more of the following services are provided:
 - a. Advised of potential eligible benefits.
 - b. Assisted in the search for replacement housing, farm land or non-residential facilities.
 - c. Given direct financial aid in the purchase or rental of new facilities.
 - d. Given direct financial aid to cover the cost of moving furniture and equipment and/or reimbursement for direct loss of property imposed as a result of the move.

Relocation is measured in terms of the numbers of families, farm units, or business establishments who must move because their facilities are to be displaced.

Factor No. 25 - Disruption

Disruption refers to changes in social organization or social function imposed by the highway facility. It is most often used with reference to the inconvenience associated with highway construction. However, to the extent that the indirect consequences inhibit the organization and functioning of social units, long-term disruption may occur. For example, excessive noise and/or air pollution adjacent to a major highway may disrupt family life or farm operation adjacent to it.

Factor No. 26 - Community Cohesion

Community cohesion refers to the forces which tend to keep a community together as a unified, integrated, socio-economic entity. These forces can manifest themselves in a physical sense, such as the attraction of churches, schools, public services and shopping areas, the opportunity for employment, the availability of certain types of residences and the ease with which intracommunity travel can be accomplished, as well as in a social sense such as the encouragement of certain life styles, the prevalence of one or more ethnic groups, and the amount of interaction which occurs in the community through clubs, service organizations, and recreational activities.

To varying degrees, these forces all act to impart on the individual a sense of belonging and a psychological identification with the community, as well as an interest in the community's future.

Indirect measures of community cohesion can be found in the extent to which people in that community (1) have a homogeneous style of life, (2) participate in the social and economic life of a community, (3) have remained in the same residence over a period of time, and (4) are able to meet most, if not all, of their basic life requirements in the community.

Community cohesion, being a very delicate quality, can be easily altered by any change in the environment. Community cohesion is enhanced when a new transportation facility improves access from one or more segments of the community to another. Community cohesion is threatened when the facility imposes barriers between two or more segments or in some other way forces a change in moral travel patterns. Isolating all or part of a neighborhood or bisecting the service area of an important social institution, such as a school, are two examples.

Factor No. 27 - Minority Interests

Minority interest refers to any special interest of a particular group or social segment of the community who may relate to the proposed facility in a unique way. While the term "minority" usually refers to racial minority or other disadvantaged group, any valid special unique interest not shared by the majority of the community must be considered as a minority interest.

Factor No. 28 - Community Values and Desires

Community values and desires refer to those matters considered important by the citizens in their community and they become the basis for the articulation of the community's goals. Public policy in turn is an attempt to establish the means whereby goals can be achieved. The values and desires of the citizens may be short or long term interest of citizens.

Ultimately community values and desires are measured at the ballot box. In highway planning the community involvement program is designed to measure those values and desires which are pertinent to the project's objectives. Two problems are inherent in such measurement. First, community values and desires are subject to change over time. Second, their expression at the neighborhood, community, and regional levels are often in conflict.

IV. METHODS FOR MEASURING SOCIAL IMPACTS

A proper method for measuring social impacts must include both the history of development of the area's existing social conditions and projections of its future development. Such measurements cannot depend upon inferences from existing records which are too often inadequate for this purpose or inadequately analyzed. Federal census data may be obsolete or inappropriate for the task. Although it may provide some very necessary information, it usually will not be sufficient information. Thus, census data must frequently be supplemented by other statistical information

TABLE 2

ORGANIZATION FOR THE EVALUATION OF SOCIAL IMPACTS

TIME FRAME	SOCIAL FACTORS	SPACIAL (AREA) REFERENCE
I. Past: What are the social conditions in the community?	1. Community Identity 2. Displacement	a. Neighborhood
II. Present: (Potential changes) What is the relationship between the proposed project and the existing social structure?	3. Relocation 4. Disruption 5. Community Cohesion	b. Community
III. Future: (Anticipated impacts) What will be the short-term and long-term consequences of the proposed facility?	6. Minority Interests 7. Community Values and Desires	c. Region

from such sources as planning departments, businesses, schools, and so forth, and thereby be improved in accuracy and reliability. Even then, however, these statistics may not be adequate for deriving the history of social development of the area.

It is essential that the "information getting system" employed in the planning process must be systematic and more than just peripheral to the planning effort. The information collected must not be simply descriptive, it must create a valuative experimental framework with which information may be interpreted. For example, the projections of the social development trends of an area must be dealt with as a hypothesis, as probabilities, and that data collected from surveys, the census, and other documentary sources are used to test the feasibility of the hypothesis. This is not an esoteric or academic process; it follows the usual approach of professionals on a more schematic basis. However, it is in contrast to arriving at a particular "solution" to a design problem based primarily on cost factors or limited transportation policy objectives. If the highway planners advocate such a solution, prior to undertaking a systematic evaluation of a social development potential of the area, that solution may run against powerful community opposition. Systematic evaluation needs to be based on the base data available and a valid analytical framework for interpretation. Such a theoretical framework for evaluation of impacts is set forth in Table 2. It breaks the analytical problem into a set of three major phases:

1. Inventory of existing conditions
2. Identification of potential changes
3. Measurement of their probable impacts (consequences)

All three of these phases are undertaken in terms of several areas of reference, depending on the location, size, and complexity of the project. These would be:

(1) the local neighborhood, (2) the community, and (3) the region. In some cases, the immediate neighborhood might require analysis independent of the community or the region. In the measurement of potential impacts, more specific analysis needs to be given to the right of way and to the area adjacent to it. In cases where the precise right-of-way location or alternative location is unknown, the discussion, of necessity, cannot be as precise or specific. Nevertheless, factors of dislocation, relocation, and disruption within and/or adjacent to the partial right of way cannot be ignored.*

When considering alternatives, one approach that is useful is to first analyze the consequences of doing nothing other than maintaining the existing facilities. The impacts of making change can be compared to this basic option.

The projection of anticipated changes in overall social organization remains important to analysis of the "null" alternative.

The social structure of an area is often a highly complex, dynamic, and probabilistic system for which the 28 indicated factors only vaguely provide an appropriate basis for analysis. The way in which people organize themselves and their institutions potentially has an infinite number of combinations. In Table 3 is presented a recommended system for the organization of social impact analysis and sets forth the sequence of analytical steps. In being specific, it is illustrative, rather than accurately descriptive of the process.

Phase I: Inventory

The study area inventory should provide documentation of what the area is like. The basic social profile of the area can be derived from census data augmented by information from local planning agencies, social and health agencies, Chambers of Commerce, or sometimes from local persons who have recorded the area's history.

*These factors and the evaluation to "near-freeway" impact are discussed in greater detail below.

However, the meaningful information will usually have to be collected from special surveys or from meetings with local officials and community leaders. Each highway study area will differ in terms of its important characteristics and in the availability of data required for their documentation. However, the social inventory should provide some documentation of each of the following:

- Historic development
- Population trends
- Characteristics of the current population
- Community values and desires
- Types of industry and commerce which provide residents of the area with a means of livelihood
- Land use trends
- Characteristics of the community's housing supply
- Public Institutions
- Dominant cultural factors

In evaluating the historic development, it is important that the analyst look at the overall structure of the community in terms of the many social institutions by which that community is organized. Some judgment about the nature of the community's social structure and the changes which might be imposed on it by a new highway facility must be made. Factual information about the structure of local governments in the area and emphasis given to various programs is important.

In determining "what is german" to the study, the analyst must face the risk of being wrong. Nevertheless, he cannot afford to include too much superfluous information as a means of insuring that nothing has been left out.

For the most part analysis of population trends since 1930 is sufficient for describing population changes but some judgment needs to be applied. Now that more than five years has elapsed since the last census, some effort should be made

to determine if significant changes have occurred since 1970. Further, a change in total population is not necessarily indicative of changes in the social characteristics of the overall population. Conversely, it is possible to have significant social change with little or no change in total population. Hence, the characteristics of the local population and the cultural institutions are important. Thus, one must look for indications that qualitative as well as quantitative changes have occurred before deciding that the trends based solely on census data are adequate.

The inventory should indicate the kind of commercial and industrial enterprises which are important in the area. However, this is not to be confused with the requirements of the economic analysis. What is of interest here are the means of livelihood for people in the area, in very general terms. To the extent germane to the type and magnitude of the transportation facility being planned, the inventory should include a description of those social institutions which play an important part in the lives of the people living within the study area.

The narrative description need not necessarily include an exhaustive inventory of all social institutions, except as may be necessary, in order to complete the remaining Phases II and III from Table 3 in the impact analysis. What should be stressed in recounting the developmental history of a community is its place within the region. In describing that place, its function in meeting more general human needs than just economic activity should be considered. Further, any unique characteristics of the people or the way in which they live which differentiates them from other communities in the region need to be identified and described.

Additional sources of information could be planning agencies and other offices of local or regional government which are normally able to supply information on

TABLE 3

1. Inventory of Existing Social conditions 2. Potential Changes 3. Impacts (Consequences)

	Community Factors*	Displacement	Relocation	Disruption	Community Factors*
Data	Service areas; populations served; neighborhood patterns, etc.	Facilities within the right of way	Institutional units within the right of way	Dysfunction imposed outside the right of way	Other probable changes attributable to the potential changes
Institutions by type and/or human needs category					
<u>Examples</u>					
1. Families	Population trends; demographic characteristics	Residential units by type, occupancy, age & condition	Families by demographic characteristics, life-style, etc.	Residential areas changed by air & water quality, noise, traffic barriers, etc.	Changed pattern, re: home to work, school, recreation, social activities, etc.
2. Farms	Agricultural activities and functions: Community Region	Farm lands by type, products & production, etc.	Farm units by occupancy type	Severences, access to markets and/or suppliers	Scale, re: regional, economic, functions; other
3. Schools	The school system's non-educational function of schools	School buildings	School units by type	School service area boundaries, bus routes	School/neighborhood relationships, etc.

*Community identity, cohesion, development values, minority interests.

land use and land use trends. Information on housing, as may be required to augment census data, is also usually available from the same sources. Community surveys are also a rich source of information. The primary function of these surveys is to determine people's community development values and their attitudes and opinions on planning and transportation issues. Even so, the values of the area residents, their occupations, demographic characteristics, and information on housing types and occupancy can be collected. This provides a valuable resource for updating or otherwise modifying the conclusions drawn from census data.

Depending upon the stage in transportation system development, the detail level of the inventory and analysis will vary. Where block statistics from the census are available, they provide some small area data. However, the number of variables is considerably smaller than for census tracts or larger census units.* If feasible, an investigator can walk through a corridor area and gain much insight about its social characteristics. Information then obtained can be used to both update and supplement the Block Statistics.

Phase II: Potential Changes

After the social characteristics of the residents and their institutions have been identified and the alternatives delineated, the social effects of undertaking such alternative must be examined in detail. The first step is to identify changes which each alternative will impose on the area through which it traverses. These changes may (1) involve displacement of the physical facilities which a variety of social institutions require, (2) change the service area of given institutions by altering mobility (transportation) patterns, or (3) modify the interaction among institutions by introducing barriers (partial or complete) to such interaction.

*Block Group Data, from the Fourth Count census tapes may be available, but will not be in "hard copy" form unless previously retrieved and recorded.

In describing these and other changes for the purpose of analyzing social impacts, it is necessary to differentiate the institutions themselves from their functions and physical facilities and from the particular segment of society they serve.

With respect to displacement, quantification, counting the amount of displacement, (for example, the number of families) is the first step in the measurement of impact. But more information is required. In the case of families, to carry the example further, the demographic characteristics of those families is important. Indicators of neighborhood and community ties including interaction with other social institutions will facilitate subsequent measurements of impacts. Length of residence and the nature of tenancy (owner/renter), place of work, school attendance, participation in institutional activities, and other variables are needed to describe the potential changes imposed by the proposed facility. Although "life style" may be a significant factor, it is not easily measured. However, it can be inferred from the range and types of housing along with previously noted variables and data from special surveys.

The importance of "life style" and related factors with respect to housing displacement and family relocation is illustrated by the Study of the Bothell Bypass (SR 522). One alternative would have displaced a relatively small number of housing units; another alternative would have required the removal of several times that since there were apartment houses within the potential right of way. Upon analysis, it was determined that most of the units to be displaced by the first alternative were generally single family residences on parcels of one acre. They were occupied by families of longer than average tenure in the area who gained their livelihood from activities on the premises or by employment within a short distance. By contrast, the apartment house occupants on the average had

resided less than one year in the community and were employed elsewhere in the region. Most of these indicated little or no active participation or interest in community life even to purchasing convenience goods at local stores. In answer to a question on the survey, most indicated their plans did not call for continued residency in the local community.

This illustration is presented to indicate the difficulty in measuring potential impacts without first gaining considerable knowledge about the study area and its people.

In the case of "displacement" of social institutions, there may be regional as well as local considerations. Some institutions may serve only a limited segment of the population or confine their service area to a single neighborhood. Other institutions have a broader community or even a regional orientation. Again with reference to the example of families, many are not "citizens" of the neighborhood in which they reside if they patronize institutions scattered through a large area far removed from their immediate neighborhood. Further, the regional capacity to accept relocation becomes a significant factor if housing resources within the neighborhood or community are inadequate.

The essential purpose of Phase II in the analysis is to identify "what is germane" in the measurement of social impacts, what specifically needs to be measured? The factors list (Table 1) provides a classification of types of impacts. Based upon the analysis of Phase I in which a general model of the community's social structure has been formed, the objective of Phase II is then to systematically determine the relationship between that structure and the proposed project. There is a subtle yet significant difference to giving the analytical emphasis to social structure rather than to the factors list.

An exhaustive list of social institutions as a checklist for identification of "what to measure" is inappropriate here. It is suggested however, that the analyst apply a systematic means for identifying the people and their institutions.

Examples of what types of questions to be raised during Phase II of the analysis are:

- What social function and/or institutions will be displaced or disrupted?
- Are there others who will be directly affected by increased noise or air pollution?
- What modifications in the social functions of the community may be expected and might they be disruptive?
- Will the new facility significantly reduce or isolate part of the service area of any important social institutions?
- May there be potential inconsistencies between the anticipated consequences of the facility and prevailing (or other strongly held) development values?
- Will the special interests of any group (organized or unorganized) be threatened or violated as a result?
- Will any portion of the community become less accessible to places of employment, recreation, health and safety facilities, or to significant social institutions which serve their needs? And so forth.

A new highway facility of any magnitude invariably has its disruptive consequences on a community's social structure or is perceived by area residents as potentially having significant disruptive consequences. Therefore, it is necessary to identify anticipated changes in the existing social structure which are reasonably attributable to any given alternative under consideration. When those changes are disruptive to the functioning of the system or any of its parts, then the measurement of disruption factors becomes important.

Unlike the preceding cases, the identification of "disruption" is not confined to institutions located within the potential right of way. Here attention is

turned to the institution's constituency and service area. Two areas of reference are important here: (1) that area immediately adjacent to the right of way within which noise levels and/or air pollution may be increased, and (2) the interaction between people and their institutions where either mode or route of access has been significantly modified.

Phase III: Impacts

To measure the social impacts of each alternative, it is important to note that measurable factual data are available in some instances and not in others. However, often the evaluation must be based upon the observations of professional personnel and on those of knowledgeable citizens residing in the area. When it becomes necessary to rely on such observations, their reliability can be improved by providing a more objective "frame of reference" for the observer. This is where data less directly pertinent to a specific issue can aid in reducing the range or variable observations to be considered. Background knowledge about the type, number, location, and other characteristics of farm units can aid the observer in measuring the impacts on the community's agricultural economy for example. The analysis in the preceding phases, as noted above, has already helped provide the desired "frame of reference".

The obvious objective is, of course, to maximize the use of factual data and minimize the use of speculative opinions. It is difficult to escape completely the inclusion of the latter. Yet, by the application of systematic methods of data collection and analysis, opinions can be clearly identified as such. Where opinions become necessary, their validity is strengthened by such facts as may be available to infer support. Systematic analysis should provide the obvious evidence that the conclusions have been derived from the available factual information even where honest men may differ.

In preparing an environmental impact statement it is not the function of the writer to justify the project nor to prove that benefits will outweigh adverse impacts. His responsibility is rather to disclose the potential consequences attributable to the proposed project. These need to be identified and considered before plans are completed. The advantages and disadvantages of each alternative must be disclosed before the decision makers can make a selection among alternatives.

Given this philosophy of disclosure, potential impacts in terms of the advantages disadvantages of each alternative need to be identified and evaluated. In the area of social factors, "cause and effect" formula are often not applicable or are inappropriate to permit precise predictions of impacts. Therefore, the analyst is often unable to predict social consequences with a high degree of confidence. To a large extent, he will be dependent upon his own judgment in the interpretation of the data available to him. Even so, intuitive speculation should be avoided. Opinions need to be expressed as conclusions stemming from rigorously disciplined logic fully disclosed.

In spite of these requirements, it is unusually feasible to evaluate potential social impacts within a reasonable range of probability. The approach is to identify significant differences among alternatives with respect to each factor even though a precise quantitative measurement of those differences may not be feasible. With this in mind, the following indicated the kinds of differences which may be important for each factor and how they might be analyzed.

Completion of the analyses of Phase I and II, above, will permit delineation of sensitive areas to be avoided. By implication, that alternative which could be laid out in such a way so as to disturb the fewest areas so designated would be given a higher preference insofar as social factors were concerned.

Because of qualitative differences among those things to be avoided and the differential value of alternative mitigations, delineation of avoidance areas requires considerable analytical attention. Once avoidance areas have been mapped for the study area, the evaluation of each alternative and analysis of potential impacts can proceed.

Displacement:

Quantification of displacement is usually a relatively simple matter of counting housing and farm units, institutional facilities, along with commercial and industrial structures. Even where alternatives are not delineated by precise right-of-way lines, valid comparisons are still possible.

Relocation:

Relocation should first be measured on the basis of the occupied facilities to be displaced. However, critical analysis of potential relocation impacts, as previously discussed above, should be undertaken. In addition to estimates of potential relocatees, some measurement of relocation resources may be appropriate. Occasionally the relocation of families with unique life styles or other special housing requirements requires a more complete analysis of potential resources, particularly if housing is in short supply. Land and facility resources for farm business establishments and institutions also may require added consideration. For most small highway projects, relocation requirements can be met through normal ongoing processes of housing-occupancy turn-over and replacement.

Disruption:

Perhaps more than any other factor, disruption is clearly divided between that occurring during construction and the more long-term consequences. If in the preceding phases of the study a reasonable understanding of the community's basic social structure has been achieved, then a comparison of the "before" and

"after" condition is possible. The analytical question is: Will the alternative weaken (or strengthen) the social structure and/or modify the way in which the community functions? In this case, changes in access to and from significant social institutions need to be considered. Is the service area of a school, for example, severed by the right of way so as to alter its ability to serve?

Community Cohesion

Regional community and neighborhood cohesion should be considered separately since the impacts might be somewhat different for these various areas. Community cohesion can lessen or become greater regardless of how much disruption occurs in various parts of the area. If a highway brings about easier movement and greater accessibility for people, greater community cohesion of a region can result. Within a neighborhood the transportation facility that facilitates movement of people and draws the various parts of the larger area together can adversely affect or alter the cohesion of the smaller group. A barrier effect can develop in a neighborhood and the nature of the small areas can be materially altered.

Minority Interests:

The type of analysis required will vary depending upon the identification of such interests in the preceding phase. It should not be too difficult to obtain from any such minority the features of each alternative which may threaten their interests.*

Community Values and Desires:

Comparative evaluation of alternatives with respect to this factor usually does not permit precise quantifications. A successful community survey or other means of citizen input, however, does provide information which is useful in evaluating alternatives. Data concerning community values may be derived from a number of sources such as resolutions enacted by the governing bodies of the

*Obtaining such opinion is an essential function of the community involvement program.

communities, the comprehensive plan, views presented at public workshops and by advisory committees, and opinions expressed by newspapers and other media.

**GUIDELINES FOR
CONDUCTING SURVEYS
CONCERNING TRANSPORTATION**

Prepared by

**WASHINGTON STATE HIGHWAY COMMISSION
DEPARTMENT OF HIGHWAYS**

In Cooperation with

**U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION**

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16. Abstract <p>The purpose of this study is to produce guidelines that provide specific, operational and action oriented assistance to those responsible for planning and implementing transportation surveys as a community involvement tool.</p> <p>A considerable amount of recent transportation survey experience along with the provision of technical information from private urban opinion survey organizations was researched and analyzed for inclusion in these guidelines. By discussing and comparing the relative merits of different survey techniques, the sampling process, questionnaire design, and examples of past surveys, these guidelines cover the theoretical as well as the practical side of the surveying process. The presentation of this information is in such a form that it can be used by field staff to insure that this vital element of a community involvement program can be performed in an efficient and effective manner.</p>			
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INTRODUCTION

This report represents a compendium of guidelines for designing and conducting transportation surveys. These guidelines are to be distributed throughout the State (in each district) for use by district engineers in planning and implementing transportation surveys where dictated by project scope.

The guidelines provide a basic framework for establishing an information needs assessment and the research design to fulfill those needs. Conversely, the guidelines demonstrate the means whereby analysis of survey findings may be instrumental in community decision-making and transportation planning, an integration that too often is never accomplished.

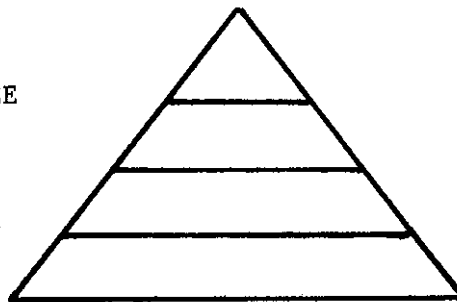
The Highway Action Plan includes the use of transportation opinion surveys as one important method of community involvement:

...Various methods to involve the community may be used to achieve program objectives such as: advisory committees, informal public meetings, workshops, hearings, exhibits at drop-in centers, surveys, information publications, personal contacts and news releases and reports through the media.

Action Plan pp. 5-6

Surveys of the population on transportation problems, needs, attitudes and behavior can and do involve more persons in the community than other means mentioned above. Through transportation surveys each member of the community has a statistical opportunity to participate in the decision-making process. As the pyramid below signifies, the survey provides the largest degree of input from the widest community base compared to other involvement mechanisms.

CITIZEN ADVISORY COMMITTEE
PUBLIC HEARINGS/MEETINGS
INFORMAL DIALOGUE/LETTERS
TRANSPORTATION SURVEYS



"INVOLVEMENT PYRAMID"

PURPOSE

The overall purpose of this report is to provide specific, operational and action-oriented guidelines for conducting transportation surveys. Further, it is to inform, educate and improve the awareness among those who may be able to utilize transportation survey research as a community involvement tool.

The purpose for conducting transportation surveys is to obtain information from citizens concerning the following factors:

- (1) State, regional and community values.
- (2) Social, economic, and environmental impacts as well as engineering concepts and details.
- (3) Provide for improved communication among citizens, decisionmakers and professional personnel.
- (4) Detect and anticipate problems.
- (5) Provide a vehicle for solutions of problems.

*What the transportation opinion survey can do.

- Surveys are effective in obtaining certain kinds of information from a target population; however, it is necessary before conducting a survey to answer a key criticism: can we assume knowledge, opinions and attitudes of the citizens are based on real or contrived environments? In other words, do the people to be contacted have sufficient understanding and knowledge to give realistic answers and useful information.

- Surveys can profile the behavior of a community through sampling only the opinions of a few. Statistics provide the sample sizes necessary to establish the number of interviews to complete, for a given set of acceptable error limits. Thus surveys can project the community patterns in an area without a 100% documentation from each resident.

- Surveys afford the public in general an opportunity to participate in the planning process - an opportunity not realized but by only a selected, pointed few in other citizen participation methods.

- Data derived from transportation surveys can be used to project the status of an area at some future point in time. Historically, surveys taken over time can be used to track trends and changes within a population's behavior and attitude.

* What the transportation opinion survey cannot do.

- Surveys deal with cognitive information, that is conscious human motivation and opinion. Therefore, surveys tend to be more quantitative than qualitative. To understand the deeply held beliefs of a population regarding transportation, sophisticated, clinical psychological inquiry techniques are required. The survey does not compete with this kind of in-depth probing into the public psyche.

- Surveys cannot be 100% accurate in what they tell the transportation planner about a community. Sampling automatically presents an error range for resultant data. It is necessary, at the outset to conducting a survey, to decide what is or is not an acceptable error limit for the survey results.

- Survey results are temporal. They represent the current thinking of the population and therefore are, like the U.S. Census, somewhat out of date the day after the interviews are complete. However, as this must be taken into consideration when planning a survey, the scope and nature of questions asked should take this into account. Further, once the survey is complete, the planner/researcher must review what, if any, events have taken place in the environment which may have a dominating factor to bias the survey results.

Establishing the Transportation Survey Objectives

The characteristics, behavior patterns, attitudes, beliefs and opinions of the population are significant considerations in planning the development of a transportation system whether it be a new or improved facility. Therefore, any actions or events which may affect this population should take into consideration (i.e., community involvement/participation) these parameters to the extent of making them an incumbent part of the decision framework.

The overall guiding objective for the transportation survey is:

TO MEASURE, THROUGH CONTEMPORARY SCIENTIFIC RESEARCH METHODOLOGIES, THE OPINIONS, VALUES, BEHAVIOR PATTERNS, ASPIRATIONS AND GENERAL CHARACTERISTICS OF THE TARGET POPULATION WHICH IS TO BE EITHER DIRECTLY OR INDIRECTLY AFFECTED BY THE TRANSPORTATION SYSTEM.

Specifically, the functional objectives should be:

1. To measure the values and desires of community residents regarding development of transportation systems in the area and any potential changes to that system.
2. To measure opinions of community residents regarding the future development of the area in which they live.
3. To measure the opinions of community residents regarding the factors which may directly or indirectly influence the planning, design and implementation of transportation systems in the area.
4. To measure the perceived social, economic and environmental impacts of transportation system developments and alternatives in the area.

5. To measure the perceived goals and objectives for transportation by community residents within the area.
6. To detect any perceived transportation problems or transportation related problems by the community residents.
7. To integrate the results from these measurements into the overall transportation planning and decision-making process.

Flexibility

It is mandatory that flexibility be maintained when setting objectives of each transportation survey due to the idiosyncrasies of individual area needs and the lifestyles of different communities in each district.

Guideline No. 01

Process of Transportation Survey Research

<u>Phase</u>	<u>Description</u>
Hypothesizing	Deciding what is to be investigated within the general area of transportation.
Designing	Establishing the procedures and methods to be employed.
Planning	Itemizing the procedures against time, resources, manpower and materials.
Resource Allocation	Arranging for the expenditure of resources, manpower and materials.
Sampling	Determining who is to be interviewed and developing the sample selection plan.
Questionnaire	Deciding on topics to be used in framing questions. Planning the mechanics and format for the questionnaire. Pretesting the questionnaire on a representative selection of respondents to determine if the mechanics elicit the necessary data.
Orientation and Training	Briefing interviewers or staff on objectives and procedures to be employed, training and simulation in technique application.
Field Work	Securing the data from respondents (in the case of a mail survey this is still the field state where questionnaires have been sent out and a proportion returned).

<u>Phase</u>	<u>Description</u>
Monitoring and Controlling	Keeping records of the field work to insure standards are being maintained, procedures followed, problems solved as they arise and work completed on schedule.
Verifying	Determining the collected information is accurate and free of defects from process or interviewer bias.
Coding	Preparing the Completed questionnaires for processing. This is a multi-faceted process involving skilled personnel who should be briefed and trained for this work.
Processing	The electronic, machine, or hand tabulation and manipulation of the collected data from questionnaires. Involves key punching, verification and computer processing using a variety of survey research tabulation programs.
Analyses and Interpretation	The manipulation and molding of resultant data from the processing phase into meaningful information including observations, interpretation, statistical analysis, conclusions and recommendations.
Reporting Results	Providing the end product to others through written, printed reports, oral presentation and group discussions.

Guideline No. 02

Selecting the Methodology for collecting data

The objectives and needs of the individual project dictate the technique to employ in gathering information from respondents. The majority of the surveys conducted by the Department of Highways have been implemented through the "drop off and pick up" procedure. The realized rate of return ranges from 50 to 80% with representative samples derived in most cases.

The following table summarizes the advantages and disadvantages of alternative techniques for collecting data in transportation opinion surveys.

<u>Technique</u>	<u>Advantages</u>	<u>Disadvantages</u>
Mail	<ol style="list-style-type: none">1. Least expensive of all methods.2. Can contact large number of households in extended areas, rural and urban.3. Follow-up increases rate of return by mail or telephone, however, increases overall costs.	<ol style="list-style-type: none">1. Low rate of return. Mail surveys conducted by Department of Highways have ranged from 6 to 45% of original mailout.2. Cannot control who completes the questionnaire.3. Bias from selected types of individuals who respond to mail more than others.4. Turnaround time longer to develop system

<u>Technique</u>	<u>Advantages</u>	<u>Disadvantages</u>
Personal, Face to Face	<ol style="list-style-type: none"> 1. Can have longer inter- view, up to one hour or more. 2. Most control of inter- view. 3. Can use visuals during interview. 4. Can observe reactions and record them. 	<ol style="list-style-type: none"> 1. Most expensive of all methods. 2. Time for completion dependent on sample dis- tribution but may be long. 3. Interviewer bias from both voice and appearance possible. 4. Co-op fee (i.e., monetary incentive) is often necessary.
In-Depth or Focus Interviews	<ol style="list-style-type: none"> 1. Qualitative rather than quantitative in nature to dig deeper into attitudes and beliefs than possible with other techniques. 2. May be used to design a questionnaire or for pretesting con- cepts. 	<ol style="list-style-type: none"> 1. Most costly per interview. 2. Restricted sample will not permit projections on the basis of results. 3. Requires highly skilled interviewer capability.

Technique

Advantages

Disadvantages

Drop Off,
Pick Up
Self Administered

1. May have long questionnaire due to self-administered
2. Less cost than personal interview.
3. Provides more opportunity for personal questions.
4. Rate of return between 50-80%.
5. Can cover large sample without selecting special addresses.

1. Possible field person bias by appearance.
2. Rate of return is less than 100%, thus incorporating potential bias.
3. Lack of control over asking questions and recording responses.

Telephone

1. Less cost than personal interview or drop off.
2. Can reach wide geographic areas from one location.
3. No bias involved from appearance of interviewer.
4. High completion rate.

1. No visuals may be used during interview.
2. Limited interview length, usually 15-20 minutes maximum.
3. Voice inflection of interviewer may have significant influence on respondent.

Guideline No. 03

Drawing the Sample

There are a number of valid scientific methods to design and complete the selection of who is to be interviewed in the transportation survey. These range from a highly precise, theoretically sound, rigidly controlled random sample of households in the target area to a non-random, quota controlled selection. Generally the procedure for any field survey requires compromise on the sample procedure as dictated by circumstances in the area and the availability of sound information about the population to be surveyed.

There are two basic considerations in establishing the sample once it is agreed who is to be interviewed (in transportation surveys, each household is an interviewing unit; that is, only one interview is taken, with the head of the household).

1. Size of sample to achieve the required precision
2. Distribution of the sample over the geographic area proportionate to household and/or population concentration.

Sample Size vs. Precision

Two tables below show the sample size requirements for selected study areas. These tables state the sample sizes needed for particular confidence intervals (95 percent and 99 percent) and when certain degrees of reliability are desired, which are shown as the column headings. Bear in mind also that a randomly selected sample is assumed.

The confidence level is a probability measure by which the sample, based on some variable, reflects the study area as a whole. A 95 percent confidence level means that there is a 95 percent chance that some variable in the sample is indicative of the study area. The degree of reliability measures the amount of discrepancy between the sample and the study area. If the degree of reliability is $\pm 1\%$, then the results of the sample can be generalized to the entire study area to within one percent. The higher the confidence level and the smaller the degree of reliability, the greater the chance that the sample will reflect a true picture of the study area.

Distribution

Several methods for distribution have been employed. In urbanized areas using cluster sampling a number of blocks are randomly selected to represent the area. A 100% distribution is achieved in these blocks during the field work phase.

Another approach is to employ a skip interval on a street basis and thus sample every fourth or "Nth" street within the area. By criss-crossing this selection, the geographic area is covered within the scope of the survey target community.

The researcher must be aware that sampling is at best a customizing process where a compromise is achieved to derive the most valid representative sample of the community characteristics within the limitations of the overall project. Major limitations include time, manpower, financial resources, seasonality, and survey scope.

95 PER CENT CONFIDENCE LEVEL				
No. of Occupied Households In Study Area	Sample Size for Reliabilities of			
	1%	2%	3%	4%
1,000	*	*	473	244
2,000	*	*	619	278
3,000	*	1,206	690	291
4,000	*	1,341	732	299
5,000	*	1,437	760	303
10,000	4,465	1,678	832	313
20,000	5,749	1,832	858	318
50,000	6,946	1,939	881	321
100,000	7,465	1,977	888	321
500,000	7,939	2,009	895	322

99 PER CENT CONFIDENCE LEVEL				
No. of Occupied Households In Study Area	Sample Size for Reliabilities of			
	1%	2%	3%	4%
1,000	*	*	*	360
2,000	*	*	873	436
3,000	*	*	1,021	470
4,000	*	1,862	1,116	489
5,000	*	2,053	1,182	502
10,000	*	2,584	1,341	527
20,000	8,213	2,967	1,437	542
50,000	10,898	3,257	1,502	551
100,000	12,231	3,367	1,525	554
500,000	13,557	3,460	1,544	557

*In these cases more than 50 percent of the occupied households in the study area are required in the sample.

Source: Herbert Arkin and Raymond R. Colton, Tables for Statisticians (New York: Barnes & Noble, Inc. 1963), pp. 151-52.

Rate of Return - Completion Allowance

It is necessary to keep in mind that sample size is determined by the number of interviews actually completed rather than the number originally attempted. As with mail surveys which often result in a 20% rate of return, should the requirement call for a sample of 200 completions, the original mail-out must be about 1,000. With personal interviewing or drop -off surveys, the rate of completion is higher, and therefore the original contact number may be less in proportion to the number of expected returns. However, as each area is unique, the researcher is wise to allow for a margin of error in estimating the completion allowance based on past projects.

Validate Your Sample Base

Always confirm with local authorities of the area, the validity of your information being employed to derive the sample. As in the case of using 1970 U. S. Census data of household distribution, this may have changed significantly in any particular area from the time of the census. In addition to local government, other sources include the U. S. Postal Service, local utilities, and major real estate concerns.

Examples of Sampling Methodologies Employed in Past Surveys by Washington

State Highways

I. Stratified Cluster Sample:

The first step in implementing this method is to determine the total number of occupied households, including renters and owners, in the study area. This information is available in the 1970 Census of Housing Block Statistics for either Seattle-Everett, Spokane, Tacoma, or selected areas. By utilizing

the census tract maps, one can determine the census tracts which lie within the area to be sampled. Once known, the owner and renter occupied totals for each census tract are added to determine the total number of occupied households in the study area. When this figure is arrived at, the next step is to decide what confidence level and range of error is desired. This can be determined by using the tables on page 13 for either a 95 or 99 percent confidence level. Keep in mind that the type of survey utilized will determine the number of questionnaires that must be distributed to achieve the desired confidence level and range of error.

Once the size of the sample is determined, the next step is to calculate what proportion of the total occupied units are within each census tract. This figure is arrived at by dividing the total number of occupied households in each census tract by the total number of occupied households in the study area. The proportion for each census tract, which is of course less than one, is then multiplied by the desired sample size, yielding the number of households to be sampled in each census tract. As an example: suppose census tract A contains .61 of the total occupied units; census tract B contains .18; and census tract C contains .21; and that a sample size of 200 is desired. Multiplying 200 times the proportion of the total households contained in each tract yields 122 households to be sampled in tract A, 36 in tract B, and 42 in tract C.

Once it is determined how many households are to be sampled in each tract, the blocks are enumerated in each tract. Using a table of random numbers, three-digit numbers are selected. Where the numbers chosen from the random table match up with an enumerated block number, then that block is selected. The number of occupied units in the block is noted and a running total is kept of

the number of units in the blocks chosen; when this total is approximately what the desired number of units for that tract is, then that tract is finished and the process is repeated for the remaining tracts until all have been done.

II. Cluster Sample with Fixed Proportions

In this method, as in Method I, the U.S. Census Block Statistics and maps are utilized to determine which census tracts lie in the area which is to be sampled. An average number of households to be sampled on each block is predetermined. Usually this is 8. This number is divided by the desired sample size. For instance, suppose a sample of 5 percent of the total occupied residences in the study area is desired. By dividing 8 by .05, giving you 160, the spacing interval is determined. The next step is to set down a running total of the number of occupied residential units on each block in the area to be sampled. To start the selection process, some three-digit number from a table of random numbers is chosen. The spacing interval then is added to this number over and over again and a running total is kept. When the running total exceeds the number of residential units for the sample area, stop. At the points where the running total of the spacing interval is less than or equal to the running total of residential units, then the block which corresponds to that number of units is chosen. This process is repeated until the running total of the spacing interval has exceeded the number of residential units.

After the blocks have been selected, the next step is to look up in a street directory the addresses of the residences on the selected blocks. These addresses should all be written down for each block. To determine how many residences are picked from each block, divide the number of residences found in the street directory for that block by the number of residences found in the census

statistics for that block and then multiply this figure by 8. When rounded to a whole number, this figure tells how many residences in that block are to be sampled. To determine which addresses are to be selected, enumerate the addresses for each individual block. Then, using a table of random numbers, select three-digit numbers. Where the numbers chosen from the random table correspond to an enumerated address, that address is selected. This process is repeated until the limit for that block is reached. When all the blocks to be sampled have been treated this way, the sampling process is complete.

Guideline No. 04

Questionnaire Design and Samples of Past Surveys

The questionnaire is the nucleus. Around this nucleus revolve the sample, the administration, the data processing and interpretation. However, without an accurate questionnaire with objective probes into the opinion layers of the community, the entire transportation survey project is not of much value. It is imperative, therefore, that extra effort be placed on design and development during the questionnaire process.

Steps in questionnaire design:

- 1) Planning session to outline various types of information to be included in the pre-test questionnaire
- 2) Drafting specific questions for the questionnaire
- 3) Review of draft by appropriate policy and/or advisory groups
- 4) Pre-test draft questionnaire on "typical" respondents; avoid "in house" pre-tests where possible, due to bias
- 5) Modify questionnaire based on pre-test
- 6) Second pre-test if necessary
- 7) Pre-coding question responses where possible:

(0) 18 - 24 years	(2) 35 - 54 years
(1) 25 - 34 years	(3) 55 and over
- 8) Finalization of questionnaire and printing

example of pre-coding

Questionnaire Outline

In past transportation surveys, the organization of the questionnaire has followed this topical outline:

1. General introduction to the questionnaire explaining purpose of the survey and instructions for completion.
2. Identification of transportation problems as perceived by community residents.
3. Evaluation and prioritizing of transportation planning factors in terms of importance.
4. Opinions on future development of the community and surrounding area and the types of development considered desirable or undesirable.
5. Proposed solutions to transportation problems and the effects these solutions would have on the area, as perceived by the respondents.
6. Characteristics of respondents and households.
7. Other behavior-oriented questions/probes.
8. Closing instructions.

The researcher must be aware the general outline provides for flexibility in customizing the nature and scope of the questions to the particular project scope and the unique characteristics of the community involved. Thus it is important to establish a reviewing body of lay and professional persons to act

as a communication sounding board for the questionnaire as it is being developed. Without this control, the researcher is designing a questionnaire in a vacuum - a very risky procedure.

The above outline does not totally cover the research objectives for gathering information in a transportation survey. Only the "shell" is provided, within which the individual study must contribute a great deal in completing the questionnaire design. Several samples of questionnaires employed in past "drop off" surveys are included here for use by districts during the planning phase.

Pre-testing

Once the researcher is satisfied with the first draft questionnaire, this instrument should be duplicated and "pre-tested" among about 25 to 30 persons both inside and outside the Department of Highways. The objective for pre-testing is to determine if the mechanics, the content, and the demands of the questionnaire are valid among the target population. Generally, one pre-test is sufficient to accomplish a review of the draft questionnaire.

Size of Print

Insure the size of print used in the questionnaire is sufficient to deter the frustration of older citizens who have optical limitations. Using larger print sizes may help to increase the validity and rate of completed interviews.

Terminology and Jargon

Terminology and professional jargon are inbred with transportation planners. Unfortunately, the average citizen does not have the same working knowledge and therefore must be communicated with in simple terms, the simpler the better. Using words and phrases like transportation facility, relative importance,

displacement, disruption aesthetics, relative desirability, bus transit facilities, and limited access facility may deter some respondents from a valid response or guessing at an answer because they do not want to be perceived as ignorant.

Cover Letters

Cover letters help to motivate people to complete self-administered questionnaires or to introduce the interviewer to the respondent in a personal interview situation. Further, it is possible to build into the questionnaire language which motivates the respondent to complete the interview. Too often an individual may start the questionnaire but never finish because of the perceived futility in organization. Language can help to overcome this problem.

Respondent Selection

It should be clear to the person receiving the self-administered questionnaire who in the household is qualified to complete the interview.

Questionnaire Length

Generally, a questionnaire which takes more than 20 minutes to complete will not be as productive as those which take less. (This assumes a drop-off, self-administered questionnaire is employed.)

In-home personal interviews may last as much as one hour and still maintain valid information gathering standards.

Telephone interviews generally should not last longer than 20 minutes.

Categories of Questions

There are four basic categories of questions:

One: Opinion Orientation

These questions solicit the opinions and, in a deeper sense, the attitudes of respondents toward or about selected subjects. In some topics, such as air pollution, the respondent may be very opinionated and be able to come up quickly with a response. In others, the topic may be removed from the sphere of activity for the respondent and therefore an opinion may not be so readily achieved. The differentiation between opinion and attitude is one of depth: attitudes are deeply held beliefs subject to little incremental variation compared to opinions, which may change quickly depending on external influences.

Two: Information Orientation

Questions of this type solicit information and cognition about various subjects. Questions here deal with awareness of selected actions, situations, or activities which may have taken place or are about to take place, and sources of information. A key element here is the awareness of respondents regarding proposed changes in the transportation system.

Three: Psychological - Perception Orientation

This category of questions deals with the respondent's perception of his or her behavior in relation to others. For example, a person may be able to compare his transportation needs with those of others when discussing the subject of car-pooling. How he perceives the needs of others is influenced by opinion and attitude.

Four: Classification Orientation

These questions deal with facts about the respondent and the household. Features here include demographics, psychographics (life style measures), and transportation habits, etc. The researcher should be familiar with the classifications used by the U.S. Census as an aid in designing questionnaires.

Examples of several different types of questionnaires used by the Department of Highways are included in Appendix A of this document.

Guideline No. 05

Implementing and Coordinating the Survey

These apply only to field surveys (personal or drop-off).

1. Generally, two-person teams are most productive in the field.
2. The amount of time required to complete field work is a function of manpower and the characteristics of the area (i.e., urban vs. rural). Cluster sampling, that is contacting more than one household within a target sample point - block or street, is the most efficient use of manpower compared to skip pattern or strict random sampling.
3. Interviewer Kits should be pre-assembled and allow for overages of questionnaires, hand out information, writing instruments, and other materials. Avoid down time due to not having given the field worker sufficient materials.
4. A training and orientation session for each field worker is mandatory. Even though you may be dealing with experienced people, a re-orientation on the objectives of the transportation survey and the exact procedures used is absolutely necessary to satisfactory end results.
5. All forms to be used in the field for control and monitoring should be pre-tested for mechanics and clarity.

6. Local authorities, police, etc. should be contacted at least one week in advance of the field date and informed as to the area, the time and the type of work which is to be accomplished.
7. Simulation during the briefing and training session is helpful to acquaint field personnel with the possible situations which may occur during the project.
8. Interviewers must be completely familiar with the questions on the questionnaire in order to more fully understand what is expected of the respondents.
9. The field workers attitude should be neutral, impartial, casual, friendly, and efficient.
10. The field worker should be responsible for keeping separate notes about the field work as it progresses and turn in these notes at the end of the project to improve on future efforts.
11. A trouble number should be established at the outset of the field work where a worker may contact the project supervisor to have questions answered and modifications in procedure, where warranted, approved.

EXAMPLE

Field Procedures

Tacoma Loop Spur Survey - Urbanized Area

TACOMA LOOP CITIZENS SURVEY

PROCEDURE:

Drop Off (First Call)

1. Maps are furnished showing each block to be surveyed.
2. Every dwelling unit in each block will be contacted.
3. Leave a questionnaire at all dwelling units where someone is home.
4. Record the necessary information on the Interviewer's Log. Use a separate Log for each block.

The questionnaires are pre-coded to correspond to the block number. Be sure to use the proper questionnaires.

If no one is home, do not leave a questionnaire - these households will be contacted again during the pick up phase; however, enter the appropriate information in the Interviewer's Log.

If the respondent refuses to take the questionnaire, still enter the address on the Log and use the questionnaire for the next household (no serial number entries for refusals).

Pick Up (Second Call)

1. One week* after the drop off, on the day indicated on the first call cover letter, return to the sample households and pick up the questionnaires.

*This interval may be shortened to two days as time and manpower permit.

2. If the questionnaire has not been completed or no one is home, leave a stamped, self-addressed envelope to mail in the questionnaire. A form letter will be supplied to explain the procedure and request cooperation.
3. For those houses that couldn't be contacted on the first call because no one was home, attempt to make contact. If home, give questionnaire and stamped, self-addressed envelope to respondent. If not home, leave the questionnaire, stamped, self-addressed envelope, and explanatory note. Should the interviewer be denied access to an apartment complex, attempts should be made to mail the residents the questionnaire. Replacement of selected residences with other units should be avoided if possible to help maintain the integrity of the sample.

PREPARATION OF THE INTERVIEWERS' PACKETS:

First Call

Each packet for each block will contain the following:

1. Four copies of Interviewer's Log
2. Numbered questionnaires with attached first call letter for the anticipated number of households.
3. Two copies of block map

In a separate folder each interviewer will carry 50 un-numbered questionnaires with cover letter and four extra log sheets. These will be used with the number hand coded, in those cases where the actual number of households exceeds those precoded.

Second Call

Each packet for each block will be revised from the first call to contain the following:

1. The log sheets and maps from the first call
2. All numbered questionnaires not distributed on the first call with second call letters and stamped, self-addressed envelope and doorhanger attached
3. Self-addressed, stamped envelopes equal in number to the number of questionnaires distributed on the first call with doorhanger attached
4. Ten extra questionnaires with second letter

Packets for each block will be kept separately in the Project Engineer's office and will be distributed to the interview teams each night for preparation.

CONDUCT AND TECHNIQUES

Conduct:

1. Always identify yourself by name and as an employee of the Washington State Department of Highways.
2. Wear your nametag at all times in the field. Keep it displayed prominently.
3. Dress neatly - to those being interviewed, you are the Highway Department.
4. Always be courteous and polite - do not argue. If a person becomes abusive, excuse yourself and immediately leave.
5. Know the general purposes of the survey - you will be asked. If pressed for details, advise them to call the number on the cover letter. Do not attempt to provide details or personal opinions.
6. Do not enter household.
7. In case of emergency of any sort, call predetermined number. A supervisor will be on duty to assist.
8. Drive and park your vehicle safely.
9. Never walk on someone's lawn!

Techniques:

1. Start at the same compass point in each block. For example, always park your vehicle at or near the NW corner of the block.
2. In starting to survey a block, drive around it once to get a general impression of the area. Check the street names against your map - new streets may have been added or old ones vacated.
3. The interview team splits the packet for the block; one proceeds clockwise and one counter-clockwise, meeting somewhere near the middle. This has proven to be the fastest method. Duplicate the procedure for the pickup call.
4. Believe "Beware of Dog" signs.
5. In apartment houses, always contact the manager first and explain what you are doing. Frequently, you will not be permitted to canvas each tenant; record the name and address of the apartment building and the name and telephone number of the manager. Should you be refused entry, give this information to the coordinator at the end of the evening so he can take care of the situation.
6. Keep your rain gear handy, and you may want something to snack on - it gets hungry out in the field.

Guideline No. 06

Setting Up the Analysis Framework

Once the transportation survey is complete and the questionnaires are collected, the question is "what to do with them?"

Actually this question was answered in the very beginning planning phase where selected information objectives were established. These objectives were either in the form of hypotheses or information needs. The completed questionnaires contain the information to test the hypotheses and satisfy the information needs. However, an analytical framework beginning with the coding plan is necessary to get from completed questionnaires to completed report.

The Coding Plan

The data resulting from completed questionnaires is generally not usable unless it has been preclassified into groupings or categories. For those open-ended questions where the respondent has an opportunity to comment somewhat verbatim, it is necessary to develop coding categories after the completion of the survey. This is done using sub-samples of the completed number. Generally about 50 questionnaires are reviewed. After reviewing the kinds of responses, a list of general, homogeneous categories can be derived and used to further prepare the questionnaire for data processing.

There are situations where the process of developing limited categories from open-end responses is not effective in preserving the substantive flavor of responses by the residents. Therefore, it is necessary to list completely the actual, verbatim responses to the questions and provide this as a separate compendium to the report.

The overall coding plan is developed during the process of recognizing the use of pre-coded answers to questions and the need for establishing other coding schemes using open-end or free response questions. A code book is developed from this process and employed by those who will be working with the completed questionnaires editing, coding, and preparing them for keypunching and eventual machine processing.

The coding plan may vary from one questionnaire to another, from one survey to another depending on the required analysis and the computer processing system. In surveys conducted by the Department of Highways, computer processing has been employed to tabulate the results from transportation surveys and assist in the statistical analysis of data.

The Tabulation Plan

There are two sections of the tabulation plan: machine tabulations completed by computer and hand tabulations which involve open-end or free response question answers.

Machine Tabulations:

Outline

Total straight counts and percentages by each question asked.

Sub total straight counts and percentages by selected categories within a question. For example, responses to all questions broken out by the age groups for the head of household may yield five separate sub totals (see following example).

<u>Questions</u>	<u>18 - 24</u>	<u>25 - 34</u>	<u>35 - 54</u>	<u>55 - 64</u>	<u>65 and over</u>
1-01	45.5%				
02	54.5%				
2-01	62.3%				
02	37.7%		etc.		
3-01	91.0%				
02	1.0%				

Cross Tabulations which represent two questions or variables in a one by one matrix:

	Age Groups - Head of Household				
	<u>18 - 24</u>	<u>25 - 34</u>	<u>45 - 54</u>	<u>55 - 64</u>	<u>65+</u>
Residence in 1970	XX.XX	XX.XX	XX.XX	XX.XX	XX.XX
Same Location	SS.SS	SS.SS	SS.SS	SS.SS	SS.SS
Different Location Within County	CC.CC	CC.CC	CC.CC	CC.CC	CC.CC
Different Location Outside County	NN.NN	NN.NN	NN.NN	NN.NN	NN.NN

During the planning phase of the survey, the researcher should have an outline of the tabulation plan prepared. Once the questionnaires are ready for processing, this tabulation plan represents the specific requests for machine tabulated data to be provided as a means of analysis.

Analyzing Data

When responses have been tabulated, data must still be analyzed and interpreted to achieve usable meaning. Statistical truths are rarely self-evident, and figures in tables mean little or nothing by themselves. Relationships need to be established among the different figures and the situation or problem which gave rise to the survey in the first place.

The essence of analysis is comparison -- a matter of determining "larger" and "smaller," or "same" and "different." The element of judgment enters in deciding how much larger is enough to be important and how much difference really matters.

A few general considerations can help in making these decisions. As a basic approach to analyzing data, it is best to concentrate on the highlights. Opinion polls can produce a plethora of numbers, all of which possess validity and many of which may be interesting. It is easy to become overwhelmed by the mass of statistics or to lose sight of the total picture in examining intriguing details. Consequently, it is better not to try to look at everything at the outset, but instead think back to the basic objectives which the survey was intended to achieve.

After the answers to the questions have been tabulated by numbers and percent of respondents, more in-depth analyses should be undertaken. For example, the responses of persons living in different geographic areas will vary. For any transportation system it is well to analyze community-wide and neighborhood attitudes and opinions separately. Likewise, the responses of different socio-economic groups and those of home-owners in contrast to renters are significant.

The data can be analyzed in great detail, but in any situation the basic purpose for conducting the survey will be important in determining how detailed the analysis should be.

It is important to remember that statistics represent people. Even when the balance of opinion inclines strongly in a particular direction, the potential power of a non-negligible minority may be an important factor in decision-making. With sample data, sample percentages can be applied to the total for the universe to obtain estimates of the number of people holding different opinions. These numbers make it possible to see just how large a group the minority is.

Another important consideration to keep in mind is that statistics mean more collectively than in isolation. The results of a single question do not tell all there is to know about the issue. If other questions in the survey touch on similar or related matters, it is wise to consider the results together to obtain a general picture, highlighted from the different angles of the specific questions.

Certain cautions need to be observed in handling data. Where sampling has been used, results will be subject to normal sampling variation: that is, percentages derived from the survey are only estimates rather than exact figures for the percentage distribution in the universe as a whole. Consequently, small differences between sample percentages may not be significant of actual differences in the universe. For this reason, it is necessary to be cautious about drawing conclusions based on small differences between sample percentages. Usually, however, sampling variation does not represent major problems in interpreting

survey data, because for the most part major differences are meaningful in decision-making.

Multi-Variate Analysis

It is not a truism to say that no single factor can explain population behavior and that there are a multiplicity of causes that must be analyzed. Multi-variate analysis refers to the use of statistical methods of analysis for the purpose of investigating multiple causation.

The basic logic underlying multi-variate analysis is employed whenever sample survey findings are analyzed by such background characteristics as sex, age, and income jointly. By means of such an analysis it is possible to determine whether a particular aspect of public attitude varies, for example by income and sex, and to what extent it varies by income independently of sex and vice versa. To the extent that this is the case, statistically speaking, we can say that variations in this aspect of attitude or opinion are explained by income or sex.

In transportation surveys, multi-variate analyses, used in conjunction with appropriate computer programs, can be effective analytical tools.

Guideline No. 07

Computer Tabulation, an Overview

Computer tabulation is the process of taking the transportation survey questionnaires and tabulating the results by a set of computer programs specifically designed to handle survey research data. There are a number of programs available to do this processing. Depending on the nature of the survey and the complexity of the questionnaire, a program should be selected that maximizes the return of dollars spent on computer processing vis-a-vis the desired type of output.

The Department of Highways has available the Statistical Package for the Social Sciences (SPSS) to handle tabulation and statistical analysis of survey data. Districts wishing to utilize this system should consult the Olympia office for information on usage parameters.

Computer tabulation is a two-stage process:

1. Preparing the input questionnaires
2. Tabulation

Preparing the input requires editing the return questionnaires, determining the data classifications to be employed in tabulation (often referred to as the "Tab Plan") and coding the responses on each questionnaire.

The tabulation stage involves taking the coded input and by card punch or other means of input processing the data into a useable, readable report. During

tabulation very simple straight counts and percentages of responses to questions are provided, as well as highly statistical calculations to determine the inter-relationships between sets of responses.

Regardless of the types of analyses to be undertaken, special significance must be placed on the first stage: preparing the input questionnaires.

Suggested Report Outlines

There are two report outlines presented here. One is a summary report which provides an overview of the survey results. This report is primarily used in public communications and for other external needs.

The second outline is comprehensive. It is the completed project report which provides the total accumulated results, including analysis of survey findings and recommendations to the design team or other planning groups.

Summary Report:

- Statement of Purpose
- Introduction
- Methodology in Overview
- Summary of Results
- Conclusions

Comprehensive Report:

- Statement of Purpose and Significance
- Objectives: Guiding and Functional
- Methodology and Procedures
- Summary of Results
- Analysis of Findings
- Table Data with Observations
- Hand-tabulated Data with Observations

- Conclusions
- Recommendations
- Appendix

Questionnaire

Critique on limitations and and shortcomings

FOLLOW-UP

This report is not the end of the transportation survey. It is the linkage between one phase of information processing and the next. The report should be viewed as an action-oriented volume which fits into the dynamics of decision making. The report also represents only the tip of the iceberg of information available from conducting the survey. The researcher must, therefore, follow up on the report to assist in its integration with other components of the transportation planning process. Each user element should be sought out and briefed on the adequacy of information provided at present from the survey as well as the storage of data available to assist in further decisions and planning.

Too often reports and their incumbent producers are viewed as static end products. Every effort should be made to insure the information contained in the report is understood, utilized, and perceived as an input to the entire planning process.

Reflected in the tables and analyses of the report are the values, opinions, behaviors and characteristics of a population. It is necessary to view the data from the human perspective of which it was spawned in order to bring back the three dimensionality to the survey results. In this light the results will be most useful.

APPENDIX A

Examples of Questionnaires

Tacoma Loop Spur Survey Questionnaire

1. THE FOLLOWING QUESTIONS SEEK TO IDENTIFY TRANSPORTATION PROBLEMS ENCOUNTERED BY CITIZENS IN YOUR AREA. DO ANY OF THE FOLLOWING FACTORS PRESENT A PERSONAL PROBLEM TO YOU OR THE MEMBERS OF YOUR HOUSEHOLD? (PLEASE CHECK ONE COLUMN FOR EACH ITEM.)

	<u>SERIOUS PROBLEM</u> (4)	<u>IMPORTANT BUT NOT SERIOUS</u> (3)	<u>MINOR PROBLEM</u> (2)	<u>NOT A PROBLEM</u> (1)	
<u>TRAFFIC</u>					
Congestion.....	_____	_____	_____	_____	11
Safety.....	_____	_____	_____	_____	12
<u>TRAVEL</u>					
To and from work.....	_____	_____	_____	_____	13
To port industrial area.....	_____	_____	_____	_____	14
To airports.....	_____	_____	_____	_____	15
To downtown areas.....	_____	_____	_____	_____	16
To recreational areas.....	_____	_____	_____	_____	17
Travel time.....	_____	_____	_____	_____	18
Travel costs.....	_____	_____	_____	_____	19
Travel comfort.....	_____	_____	_____	_____	20
<u>PARKING</u>					
In downtown areas.....	_____	_____	_____	_____	21
In other commercial areas.....	_____	_____	_____	_____	22
<u>BUSES</u>					
Schedules difficult to understand.....	_____	_____	_____	_____	23
Routes not known.....	_____	_____	_____	_____	24
Time between buses too long...	_____	_____	_____	_____	25
Too crowded on buses.....	_____	_____	_____	_____	26
No bus service in my area.....	_____	_____	_____	_____	27
Takes too long on bus to get there.....	_____	_____	_____	_____	28
Total bus service inadequate..	_____	_____	_____	_____	29
<u>TRANSFERRING</u>					
From car to bus.....	_____	_____	_____	_____	30
From car to train.....	_____	_____	_____	_____	31
<u>BICYCLES</u>					
Bicycle lanes needed.....	_____	_____	_____	_____	32
<u>SIDEWALKS</u>					
Sidewalks needed.....	_____	_____	_____	_____	33
<u>TAXIS</u>					
Problems using taxis.....	_____	_____	_____	_____	34

COMMENTS: _____ 35

2. THERE ARE MANY FACTORS WHICH ARE INVOLVED IN DECIDING THE LOCATION AND DESIGN OF TRANSPORTATION FACILITIES (streets, highways, bus lanes, bicycle paths, etc.). EVEN THOUGH ALL OF THESE FACTORS ARE IMPORTANT, THEY MAY NOT BE OF EQUAL IMPORTANCE TO EACH PERSON LIVING IN THIS AREA. PLEASE CHECK THE ANSWER BELOW WHICH COMES CLOSEST TO REPRESENTING THE RELATIVE IMPORTANCE OF EACH FACTOR TO YOU.

	<u>EXTREMELY</u> <u>IMPORTANT</u> (4)	<u>IMPORTANT</u> (3)	<u>RELATIVELY</u> <u>UNIMPORTANT</u> (2)	<u>NOT</u> <u>IMPORTANT</u> (1)	
<u>POLLUTION</u>					
Noise.....	_____	_____	_____	_____	36
Air.....	_____	_____	_____	_____	37
Water.....	_____	_____	_____	_____	38
<u>FUEL CONSUMPTION</u>					
	_____	_____	_____	_____	39
<u>OPPORTUNITIES FOR</u> <u>BUSINESS DEVELOPMENT</u>					
	_____	_____	_____	_____	40
<u>REMOVAL OF</u>					
Park and recreation facilities	_____	_____	_____	_____	41
Residential housing.....	_____	_____	_____	_____	42
Commercial areas.....	_____	_____	_____	_____	43
Industrial areas.....	_____	_____	_____	_____	44
Wildlife & natural terrain....	_____	_____	_____	_____	45
<u>DISRUPTION OF</u>					
Services provided by government: schools, health care, police, and others.....	_____	_____	_____	_____	46
Church territories and other religious organizations	_____	_____	_____	_____	47
Fraternal clubs territories...	_____	_____	_____	_____	48
<u>AESTHETICS</u>					
Eye appeal.....	_____	_____	_____	_____	49
Fits with surroundings.....	_____	_____	_____	_____	50
<u>ACCESSIBILITY</u>					
Ease and convenience of using the new facility.....	_____	_____	_____	_____	51
Travel time.....	_____	_____	_____	_____	52
<u>SAFETY</u>	_____	_____	_____	_____	53

COMMENTS: _____

54

3. THE LOCATION AND DESIGN OF TRANSPORTATION FACILITIES (streets, highways, bus lanes, bicycle paths, etc.) ARE DETERMINED TO A LARGE PART BY THE WAY AN AREA GROWS AND DEVELOPS OVER A LONG PERIOD OF TIME. PLEASE CHECK THE ANSWER BELOW WHICH COMES CLOSEST TO REPRESENTING HOW DESIRABLE OR UNDESIRABLE YOU FEEL EACH OF THE ITEMS WOULD BE TO THE TACOMA AREA IF THEY WERE DEVELOPED IN THE YEARS AHEAD. (Please check ONE column for each item).

POSSIBLE DEVELOPMENT AREAS	HIGHLY	DESIRABLE	RELATIVELY	UNDESIRABLE	
	DESIRABLE	(3)	UNDESIRABLE	(1)	
	(4)		(2)		
<u>HOUSING</u>					
Single family housing.....	_____	_____	_____	_____	55
Multi-family housing (duplexes & apartments).....	_____	_____	_____	_____	56
Mobile home parks.....	_____	_____	_____	_____	57
No new housing developments...	_____	_____	_____	_____	58
<u>COMMERCIAL</u>					
Develop new commercial centers	_____	_____	_____	_____	59
Improve or expand existing commercial centers.....	_____	_____	_____	_____	60
No new commercial center developments.....	_____	_____	_____	_____	61
<u>INDUSTRIAL</u>					
Develop new industrial centers	_____	_____	_____	_____	62
Improve or expand existing industrial centers.....	_____	_____	_____	_____	63
No new industrial center developments	_____	_____	_____	_____	64
<u>PRESERVE FARMLAND</u>	_____	_____	_____	_____	65
<u>PARKS, RECREATIONS, WILDLIFE</u>					
Develop more parks.....	_____	_____	_____	_____	66
Develop more indoor recreation facilities	_____	_____	_____	_____	67
Develop more outdoor recreation facilities.....	_____	_____	_____	_____	68
No new indoor recreation facilities.....	_____	_____	_____	_____	69
No new outdoor recreation facilities.....	_____	_____	_____	_____	70
Preserve places for wildlife protection.....	_____	_____	_____	_____	71
<u>PUBLIC FACILITIES</u>					
Develop additional colleges...	_____	_____	_____	_____	72
Develop additional vocational schools.....	_____	_____	_____	_____	73
Develop additional health care facilities, like hospitals and clinics.....	_____	_____	_____	_____	74
No new colleges.....	_____	_____	_____	_____	75
No new vocational schools.....	_____	_____	_____	_____	76

4. THINKING ABOUT THE FUTURE FOR THIS TACOMA AREA, WHAT POPULATION CHANGE WOULD YOU LIKE TO SEE? 11

- Sizable Increase? _____ (5)
- Minor Increase? _____ (4)
- No Change? _____ (3)
- Minor Decrease? _____ (2)
- Sizable Decrease? _____ (1)

5. IF YOU WANT AN INCREASE OR DECREASE IN POPULATION, WHAT PERCENT OF INCREASE OR DECREASE WOULD YOU LIKE TO SEE IN THE NEXT DECADE? _____% 12-14

6. THERE HAS BEEN SOME DISCUSSION TO POSSIBLY IMPROVE BUS SERVICE IN THE TACOMA AREA. LISTED BELOW ARE POSSIBLE WAYS TO IMPROVE THE SERVICE. PLEASE CHECK THE ANSWER WHICH BEST DESCRIBES HOW IMPORTANT OR UNIMPORTANT YOU FEEL EACH IS AS A POSSIBLE IMPROVEMENT IDEA.

	<u>EXTREMELY</u> <u>IMPORTANT</u> (4)	<u>IMPORTANT</u> (3)	<u>RELATIVELY</u> <u>UNIMPORTANT</u> (2)	<u>NOT</u> <u>IMPORTANT</u> (1)	
Provide more frequent service.	_____	_____	_____	_____	15
Extend bus routes to provide better coverage.....	_____	_____	_____	_____	16
Establish new bus routes.....	_____	_____	_____	_____	17
Maintain low bus fares.....	_____	_____	_____	_____	18
Provide fare-free bus service with a tax-supported bus system.....	_____	_____	_____	_____	19
Provide special services to and from major employment centers.....	_____	_____	_____	_____	20
Ban cars from the most congested downtown streets.....	_____	_____	_____	_____	21
Free bus service within downtown area.....	_____	_____	_____	_____	22
Designate one or more lanes of major streets for exclusive use of buses during peak demand periods.....	_____	_____	_____	_____	23
Reduce travel time.....	_____	_____	_____	_____	24
Provide greater comfort and convenience.....	_____	_____	_____	_____	25
Provide service to handicapped.....	_____	_____	_____	_____	26

7. PLEASE INDICATE THE NUMBER OF PEOPLE LIVING IN YOUR HOUSEHOLD WHO NORMALLY TRAVEL TO WORK IN THE FOLLOWING AREAS BY THE FOLLOWING METHODS:

	<u>DRIVE ALONE</u>	<u>MEMBER OF CARPOOL</u>	<u>TRANSIT PASSENGER</u>	<u>BICYCLE</u>	<u>OTHER (Specify)</u>
Downtown Tacoma.....	(27)	(28)	(29)	(30)	(31)
Tacoma Industrial Area...	(32)	(33)	(34)	(35)	(36)
Fort Lewis.....	(37)	(38)	(39)	(40)	(41)
Northeast Tacoma.....	(42)	(43)	(44)	(45)	(46)
Southwest Tacoma.....	(47)	(48)	(49)	(50)	(51)
Federal Way.....	(52)	(53)	(54)	(55)	(56)
Renton.....	(57)	(58)	(59)	(60)	(61)
Other Areas in King County	(62)	(63)	(64)	(65)	(66)
Olympia.....	(67)	(68)	(69)	(70)	(71)
Other (Please specify)...	(72)	(73)	(74)	(75)	(76)

8. LISTED BELOW ARE POSSIBLE COURSES OF ACTION WHICH COULD BE TAKEN CONCERNING TRANSPORTATION PROBLEMS IN THE TACOMA AREA. PLEASE READ EACH ONE AND THEN CHECK THE ANSWER WHETHER YOU ARE IN FAVOR, OPPOSED, OR UNSURE ABOUT THAT COURSE OF ACTION.

	FAVOR	OPPOSED	UNSURE	
(A) Provide a means to reduce congestion on Pacific Avenue between I-5 and downtown Tacoma.....	_____	_____	_____	11
(B) Provide a more direct route from the Pacific Avenue Interchange on I-5 to downtown Tacoma.....	(3)	(2)	(1)	
(C) Provide for easier movement of traffic from downtown Tacoma to the Port Industrial Area. (Existing movement is provided by the 11th and 15th Street bridges).....	(3)	(2)	(1)	12
(D) Provide for easier movement of traffic from McKinley Hill - D Street area to the Port Industrial Area.....	(3)	(2)	(1)	13
(E) Provide for easier movement of traffic from Northern Tacoma to the Port Industrial Area.....	(3)	(2)	(1)	14
(F) Retain present access facilities to downtown Tacoma and the Port Industrial Area with some changes to improve safety and traffic flow. (Example: Remove parking from downtown streets, reserve bus lanes, etc.).....	(3)	(2)	(1)	15
(G) Make no improvements to existing system except maintenance as required.....	(3)	(2)	(1)	16
(H) Improve existing routes from the north end of Tacoma to the Port Industrial Area...	(3)	(2)	(1)	17
(I) Develop a new limited access facility to move traffic from the Port Industrial Area to a connection with I-5 for northbound traffic.....	(3)	(2)	(1)	18
	(3)	(2)	(1)	19

YOUR ANSWERS TO THE FOLLOWING QUESTIONS WILL BE MOST HELPFUL IN ANALYZING THE RESULTS FROM THIS SURVEY. OF COURSE, ALL YOUR ANSWERS AND THOSE OF EVERYONE WHO COMPLETES THIS QUESTIONNAIRE WILL BE KEPT STRICTLY CONFIDENTIAL.

9. ABOUT HOW LONG HAVE YOU LIVED IN THE TACOMA AREA? 20

- _____ Less than six months
(1)
- _____ Six months but less than one year
(2)
- _____ One to three years
(3)
- _____ More than three years
(4)

10. HOW MANY MEMBERS OF YOUR HOUSEHOLD ARE IN THE FOLLOWING AGE GROUPS?

<u> </u> 17 years or less	<u> </u> 45-64 years
21	24
<u> </u> 18-24 years	<u> </u> 65 and over
22	25
<u> </u> 25-44 years	
23	

11. HOW MANY MEMBERS OF YOUR HOUSEHOLD ARE IN THE FOLLOWING OCCUPATIONS?
(Please indicate primary occupation.)

<u> </u> 26	Professional and Technical (doctors, teachers, engineers, etc.)
<u> </u> 27	Managerial and Administrative (owners and managers of businesses, governmental administrators, etc.)
<u> </u> 28	Clerical (office workers, secretaries, bookkeepers, etc.)
<u> </u> 29	Craftsmen (carpenters, mechanics, upholsterers, machinists, etc.)
<u> </u> 30	Equipment Operators (truck drivers, sewing machine operators, etc.)
<u> </u> 31	Laborers (window washers, hod carriers, track laborers, etc.)
<u> </u> 32	Sales Workers (salesmen, checkers, clerks, etc.)
<u> </u> 33	Service Workers (firemen, policemen, beauticians, practical nurses, etc.)
<u> </u> 34	Homemaker
<u> </u> 35	Student
<u> </u> 36	Retired
<u> </u> 37	Other

Fill in only if not employed in another category greater than 50% of the time.

12. IN WHAT TYPE OF DWELLING UNIT DO YOU LIVE?

<u> </u> Single family dwelling	<u> </u> Mobile home	
(1)	(4)	
<u> </u> Duplex	<u> </u> Other (specify) _____	38
(2)	(5)	
<u> </u> Apartment		
(3)		

13. PLEASE INDICATE YOUR SEX: Male Female 39

<u> </u> 17 years or less	<u> </u> 45-64 years	
(1)	(4)	
<u> </u> 18-24 years	<u> </u> 65 and over	40
(2)	(5)	
<u> </u> 25-44 years		
(3)		

15. HOW MANY PERSONS, INCLUDING YOURSELF, RESIDE IN YOUR HOUSEHOLD? _____ 41

16. DO YOU OWN OR RENT THE DWELLING UNIT IN WHICH YOU LIVE?

_____ Own _____ Rent 42
(1) (2)

COMMENTS: _____

_____ 43

THANK YOU FOR TAKING THE TIME TO PARTICIPATE IN THIS SURVEY. SHOULD YOU WANT
A SUMMARY OF THE RESULTS, ONE MAY BE OBTAINED BY CALLING 593-2058 AND PLACING
YOUR NAME ON THE MAILING LIST.

AGAIN, THANKS.

STATE DEPARTMENT OF HIGHWAYS

Spokane Transportation Study

Mail Out Questionnaire

**SPOKANE REGIONAL PLANNING CONFERENCE
TRANSPORTATION STUDY DIVISION**

1					
1	2	3	4	5	6
7	8	9	10	11	12
13	14	15	16	17	18

TRANSPORTATION GOALS AND OBJECTIVES SURVEY

This questionnaire has been prepared to obtain the opinions of Spokane area residents. It contains questions about alternative courses of action in the development of transportation facilities and about community values in general. This is your opportunity to become a part of the planning process concerning the transportation problem in the Spokane metropolitan area. **PLEASE ANSWER ALL PARTS OF EVERY QUESTION EVEN THOUGH YOU GENERALLY USE ONLY ONE FORM OF TRANSPORTATION. YOUR ANSWERS WILL REMAIN CONFIDENTIAL.**

1. The following questions seek to identify transportation problems encountered in the use of Spokane's existing transportation system. As an individual do any of the following factors present a personal problem to you or the members of your household?
(Please check one column for each item.)

	SERIOUS PROBLEM (4)	IMPORTANT BUT NOT SERIOUS (3)	MINOR PROBLEM (2)	NOT A PROBLEM (1)	
Traffic congestion	_____	_____	_____	_____	14
Traffic safety	_____	_____	_____	_____	15
Travel to work	_____	_____	_____	_____	16
Travel to airport	_____	_____	_____	_____	17
Travel to downtown area	_____	_____	_____	_____	18
Travel between north suburban area and Spokane Valley	_____	_____	_____	_____	19
Travel across town	_____	_____	_____	_____	20
Travel between shopping centers	_____	_____	_____	_____	21
Travel time	_____	_____	_____	_____	22
Travel costs	_____	_____	_____	_____	23
Travel comfort	_____	_____	_____	_____	24
Parking in downtown areas	_____	_____	_____	_____	25
Parking in other commercial areas	_____	_____	_____	_____	26
Bus schedules difficult to understand	_____	_____	_____	_____	27
Bus routes not known	_____	_____	_____	_____	28
Time between buses too long	_____	_____	_____	_____	29
Buses too crowded	_____	_____	_____	_____	30
Lack of bus service	_____	_____	_____	_____	31
Transfer between different types of transportation	_____	_____	_____	_____	32
Bicycle lanes or paths not provided	_____	_____	_____	_____	33
Sidewalks not provided	_____	_____	_____	_____	34
Problems in using taxis	_____	_____	_____	_____	35

2. The location, design and access of transportation facilities are determined to a large extent by the manner in which an area develops over an extended period of time. What is the relative desirability of development of each of the following items for the Spokane metropolitan area in the years ahead? (Please check one column for each item.)

	HIGHLY DESIRABLE (4)	DESIRABLE (3)	RELATIVELY UNDESIRABLE (2)	UNDESIRABLE (1)	
Single family housing on urban size lots	_____	_____	_____	_____	36
Single family housing tracts of one acre or larger	_____	_____	_____	_____	37
Multi-family housing tracts	_____	_____	_____	_____	38
Mobile home parks	_____	_____	_____	_____	39
No new housing developments	_____	_____	_____	_____	40
Develop new commercial centers	_____	_____	_____	_____	41
Improve or expand existing centers	_____	_____	_____	_____	42
No change in commercial centers	_____	_____	_____	_____	43

	HIGHLY DESIRABLE (4)	DESIRABLE (3)	RELATIVELY UNDESIRABLE (2)	UNDESIRABLE (1)	
Develop more parks	_____	_____	_____	_____	44
Develop more indoor recreation facilities	_____	_____	_____	_____	45
Develop more outdoor recreation facilities	_____	_____	_____	_____	46
Preservation of wildlife habitat	_____	_____	_____	_____	47
Preservation of farmland	_____	_____	_____	_____	48
Enlarge colleges and technical schools	_____	_____	_____	_____	49
Develop additional healthcare facilities	_____	_____	_____	_____	50
Develop new industrial facilities	_____	_____	_____	_____	51
Improve or expand existing industrial facilities	_____	_____	_____	_____	52
No change in industrial activity	_____	_____	_____	_____	53

3. What population change would you like to see in the Spokane metropolitan area?
 Substantial increase _____ Minor increase _____ No change _____ Decrease _____ 54
 (4) (3) (2) (1)

4. There are a number of public services provided to the residents of metropolitan Spokane. For each of the following items, identify whether you believe more or less money and effort should be spent:

	MONEY AND EFFORT TO BE SPENT:					2
	MUCH MORE (5)	MORE (4)	SAME (3)	LESS (2)	MUCH LESS (1)	
Urban renewal	_____	_____	_____	_____	_____	14
Services for the aged	_____	_____	_____	_____	_____	15
Education	_____	_____	_____	_____	_____	16
Improved air quality	_____	_____	_____	_____	_____	17
Improved water quality	_____	_____	_____	_____	_____	18
Police & fire protection	_____	_____	_____	_____	_____	19
Parks & recreation facilities	_____	_____	_____	_____	_____	20
Roads, streets and highways	_____	_____	_____	_____	_____	21
Public transportation	_____	_____	_____	_____	_____	22
Health & hospital services	_____	_____	_____	_____	_____	23
Social-welfare programs	_____	_____	_____	_____	_____	24
Sewer & solid waste disposal	_____	_____	_____	_____	_____	25

5. There are many area wide problems encountered in determining the location and design of transportation facilities. Even though all of these factors are important, they are not considered of equal importance by each person. What is the relative importance of each of the following items to you?

	EXTREMELY IMPORTANT (4)	IMPORTANT (3)	RELATIVELY UNIMPORTANT (2)	NOT IMPORTANT (1)	
Noise control	_____	_____	_____	_____	26
Air pollution control	_____	_____	_____	_____	27
Water pollution control	_____	_____	_____	_____	28
Fuel consumption	_____	_____	_____	_____	29
Opportunities for private development	_____	_____	_____	_____	30
Displacement of parks and recreation facilities	_____	_____	_____	_____	31
Displacement of residential housing	_____	_____	_____	_____	32
Displacement of commercial areas	_____	_____	_____	_____	33
Displacement of industrial areas	_____	_____	_____	_____	34
Displacement of wildlife and natural terrain	_____	_____	_____	_____	35
Disruption of school service areas	_____	_____	_____	_____	36
Disruption of church service areas	_____	_____	_____	_____	37
Cost of improving street or road facilities	_____	_____	_____	_____	38
Cost of providing improved transit service	_____	_____	_____	_____	39
Cost of providing bicycle and pedestrian facilities	_____	_____	_____	_____	40
Cost of preserving or improving the environment	_____	_____	_____	_____	41

6. What is your opinion of the relative importance of the following proposals for transportation in the Spokane metropolitan area?

A. Arterial Street and Highway System (Please give your opinion for each of the items listed.)

	EXTREMELY IMPORTANT (4)	IMPORTANT (3)	RELATIVELY UNIMPORTANT (2)	NOT IMPORTANT (1)	
Improve existing arterial streets and roads	_____	_____	_____	_____	42
Develop new arterial streets and roads	_____	_____	_____	_____	43
Develop new freeway/expressway facilities	_____	_____	_____	_____	44
Utilize one-way streets to relieve traffic congestion	_____	_____	_____	_____	45
Develop more safety features (pedestrian overpasses, street lighting, etc.)	_____	_____	_____	_____	46
Widen intersections	_____	_____	_____	_____	47
Improve street maintenance	_____	_____	_____	_____	48
Provide additional off-street parking areas in place of on-street parking	_____	_____	_____	_____	49
Eliminate on-street parking downtown	_____	_____	_____	_____	50
Provide free parking by cooperating stores and businesses	_____	_____	_____	_____	51

B. Bus Transit System (Please give your opinion for each of the items listed.)

	EXTREMELY IMPORTANT (4)	IMPORTANT (3)	RELATIVELY UNIMPORTANT (2)	NOT IMPORTANT (1)	
Provide more frequent service	_____	_____	_____	_____	52
Extend bus routes to provide better coverage	_____	_____	_____	_____	53
Maintain low bus fares (not to exceed 25¢)	_____	_____	_____	_____	54
Provide fare-free metropolitan wide bus service	_____	_____	_____	_____	55
Provide special services to and from major employment centers	_____	_____	_____	_____	56
Establish new crosstown bus routes (east-west in City and north-south in Valley)	_____	_____	_____	_____	57
Provide park-and-ride lots with express bus service	_____	_____	_____	_____	58
Provide dial-a-bus service (pickup from your house or nearby corner on call)	_____	_____	_____	_____	59
Ban cars from the most congested downtown streets and provide mini-bus service from fringe parking areas	_____	_____	_____	_____	60
Free bus service within downtown area	_____	_____	_____	_____	61
Designate one or more lanes of major streets for exclusive use by buses	_____	_____	_____	_____	62

C. Other Forms of Transportation (Please give your opinion for each of the items listed.)

	EXTREMELY IMPORTANT (4)	IMPORTANT (3)	RELATIVELY UNIMPORTANT (2)	NOT IMPORTANT (1)	
Develop bicycle lanes or paths	_____	_____	_____	_____	63
Provide more sidewalks along streets and roads	_____	_____	_____	_____	64
Establish commuter rail transit system	_____	_____	_____	_____	65

7. How often do you or members of your household use the existing bus service for each of the following types of trips?

3

	FREQUENT (Several times per week) (4)	OCCASIONAL (Several times per month) (3)	SELDOM (Several times per year) (2)	NEVER (1)	
Work	_____	_____	_____	_____	14
Business or shopping	_____	_____	_____	_____	15
School	_____	_____	_____	_____	16
Other	_____	_____	_____	_____	17

8. How significant do you believe the development of a more adequate transit system would be in altering the need to improve or develop new streets and highways in the Spokane metropolitan area?

____ Very Significant (4) ____ Significant (3) ____ Relatively Insignificant (2) ____ Insignificant (1) 18

9. If it becomes necessary, would you be willing to pay additional taxes to improve the transit system?

____ Yes (1) ____ No (2) 19

10. Would you be willing to have a portion of gas taxes designated for mass transit, realizing this will divert money that would otherwise be available for street and road improvements?

____ Yes (1) ____ No (2) 20

11. Would you be willing to have a portion of general taxes, such as sales and property taxes, designated for mass transit, realizing this will divert money that would otherwise be available for other governmental services?

____ Yes (1) ____ No (2) 21

12. If the present transit system were to be expanded or improved, would you ride the bus rather than drive your own car:

	FREQUENT (Several times per week) (4)	OCCASIONAL (Several times per month) (3)	SELDOM (Several times per year) (2)	NEVER (1)	
To work	_____	_____	_____	_____	22
For business or shopping	_____	_____	_____	_____	23
To school	_____	_____	_____	_____	24
For other trip purposes	_____	_____	_____	_____	25

13. Recently a series of events affecting automobile travel, including air quality control and the cost and shortage of gasoline, have occurred. It appears that these events will probably limit the use of automobile travel. What is your opinion regarding each of these suggestions?

A. Individual Action (Please check your opinion toward each of the following actions.)

	STRONGLY AGREE (4)	AGREE (3)	DISAGREE (2)	STRONGLY DISAGREE (1)	
Reduce use of my car for travel to work	_____	_____	_____	_____	26
Reduce use of my car for business and recreational activities	_____	_____	_____	_____	27
Take bus to work	_____	_____	_____	_____	28
Take bus for business and recreational activities	_____	_____	_____	_____	29
Form carpool for travel to work	_____	_____	_____	_____	30
Use air, rail or bus for trips beyond Spokane metropolitan area	_____	_____	_____	_____	31
Walk or use bicycle for transportation	_____	_____	_____	_____	32

B. Local Governmental Action (Please check your opinion toward each of the following actions.)

	STRONGLY AGREE (4)	AGREE (3)	DISAGREE (2)	STRONGLY DISAGREE (1)	
Limit use of cars in downtown area	_____	_____	_____	_____	33
Reduce number of parking spaces in downtown area	_____	_____	_____	_____	34
Provide bus service through downtown from parking lots outside downtown area	_____	_____	_____	_____	35
Require mandatory carpooling or use of transit for work trips to major employment centers	_____	_____	_____	_____	36
Ban cars from certain areas or during certain hours	_____	_____	_____	_____	37
Provide more bicycle and pedestrian facilities	_____	_____	_____	_____	38

	STRONGLY AGREE (4)	AGREE (3)	DISAGREE (2)	STRONGLY DISAGREE (1)	
Provide significantly improved metropolitan transit service	_____	_____	_____	_____	39
Provide free or low cost parking for vehicles carrying three or more persons (carpooling)	_____	_____	_____	_____	40
Increase parking fees in congested areas	_____	_____	_____	_____	41

C. National or State Action (Please check your opinion toward each of the following actions.)

	STRONGLY AGREE (4)	AGREE (3)	DISAGREE (2)	STRONGLY DISAGREE (1)	
Restrict horsepower and/or size of automobiles	_____	_____	_____	_____	42
Ration gasoline	_____	_____	_____	_____	43
Increase price of gasoline	_____	_____	_____	_____	44
Limit number of cars per household	_____	_____	_____	_____	45
Require autos to meet strict pollution control standards	_____	_____	_____	_____	46
Variable automobile fees, based on the number of persons carried, miles driven, number of cars owned, horsepower, etc.	_____	_____	_____	_____	47

The following questions are necessary for statistical analyses of the data obtained from the questionnaire. Would you please provide the following information concerning your household?

14. How many persons, including yourself, reside in your household (family members and others living with you)?
 _____ Number of Male Members _____ Number of Female Members
48-49 50-51

15. How many household members, including yourself, are in each of the following age groups?
 _____ 0-5 years _____ 18-24 years _____ 45-64 years
52 54 56
 _____ 6-17 years _____ 25-44 years _____ 65 & Over
53 55 57
 How many adult members of your household are gainfully employed? _____
58-59

16. Total household income per year (before taxes)?
 _____ Under \$4,999 _____ \$7,000 to \$9,999 _____ \$15,000 to \$20,000
(1) (3) (5)
 _____ \$5,000 to \$6,999 _____ \$10,000 to \$14,999 _____ Over \$20,000
(2) (4) (6) 60

17. Do you rent or own the dwelling unit in which you live? _____ Own _____ Rent _____ Other
(1) (2) (3) 61
 In what type of dwelling unit do you reside?
 _____ Single Family dwelling _____ Duplex _____ Apartment
(1) (3) (4)
 _____ Mobile Home _____ Other (specify)
(2) (5) 62

18. How many years have you lived in the Spokane metropolitan area? _____
63-64

19. How many years have you lived in this house or dwelling unit? _____
65-66

20. Do you like the area in which you live? _____ Yes _____ No
(1) (2) 63

21. Do you plan to move from the Spokane metropolitan area?
 _____ Yes _____ Uncertain _____ No
(1) (2) (3) 68

Please indicate the number of household members, including yourself, employed according to each occupation (by the following census categories):

- _____ 69 Professional and technical (doctors, teachers, engineers, lawyers, etc.)
 - _____ 70 Managerial and administrative (owners & managers of businesses, governmental administrators, etc.)
 - _____ 71 Clerical (office workers, secretaries, bookkeepers, etc.)
 - _____ 72 Craftsman (carpenters, mechanics, upholsterers, machinists, etc.)
 - _____ 73 Equipment operators (truck drivers, sewing machine operators etc.)
 - _____ 74 Laborers (window washers, hod carriers, track laborers, etc.)
 - _____ 75 Sales Workers (salesmen, checkers, clerks, etc.)
 - _____ 76 Service Workers (firemen, policemen, beauticians, practical nurse, etc.)
 - _____ 77 Homemaker
 - _____ 78 Student
 - _____ 79 Retired
 - _____ 80 Other
- } Fill in only if not employed in another category greater than 50% of the time.

23. As a metropolitan Spokane resident, what participation do you desire to have in the planning of transportation improvements?

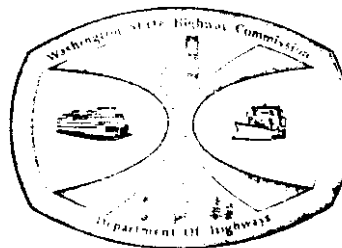
24. Please complete the following statement. I would use public transportation if

25. Please make any additional comments you would like to make pertaining to transportation in Spokane metropolitan area (use additional pages as needed).

APPENDIX B

**Examples of Cover Letters and
Door Hangers**

WASHINGTON STATE
HIGHWAY COMMISSION
DEPARTMENT OF HIGHWAYS



Daniel I. Evans, Governor
W.H. Andrews, Director

Office of District Engineer
District 7
10506 N.E. 4th Street
Bellevue, Washington 98004

April, 1975

Dear Resident:

The Department of Highways has agreed to design and construct park & ride lots at a number of locations for Metro Transit and the Municipality of Metropolitan Seattle. The Department has organized an Interdisciplinary Team to assure that the social, economic and environmental considerations and impacts will be addressed.

The attached survey questionnaire was developed to obtain your opinions, values and needs concerning the design and location of a park & ride lot in your community.

We have selected at random certain households in your community to which the questionnaire is being sent. Because of the randomness of the sample design, we can compare the results of the questionnaire to the U. S. Census. In this way, the representativeness of the sample can be verified. Your completion of the questionnaire is needed to ensure the success of this effort.

All information provided by you will be treated confidentially and reported in statistical form. The data will be provided to any concerned resident once it is compiled. Analysis will be made from the grouped data. Your cooperation in the survey will be greatly appreciated.

Additional information concerning this questionnaire can be obtained by calling our project office at 464-7590.

A staff member will return next week on the evening circled below to pick up your completed questionnaire.

Monday

Tuesday

Wednesday

Thursday

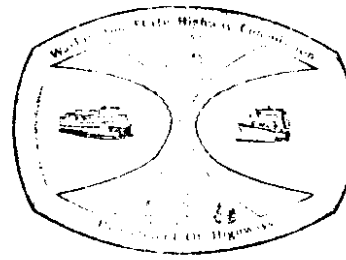
Friday

Very truly yours,

E. I. ROBERTS
District Engineer

EIR:wjk
Attach.

WASHINGTON STATE
HIGHWAY COMMISSION
DEPARTMENT OF HIGHWAYS



THE UNIVERSITY OF WASHINGTON
LIBRARY

Office of District Engineer
District 7
10506 N.E. 4th Street
Bellevue, Washington 98004

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All information provided by you will be treated confidentially and reported in statistical form. The data will be provided to any concerned resident once it is compiled. Analysis will be made from the grouped data. Your completing the questionnaire and returning it in the enclosed envelope at your convenience will be greatly appreciated.

Additional information concerning this questionnaire can be obtained by calling our project office at 464-7590.

Very truly yours,

A handwritten signature in black ink that reads "E. I. Roberts". The signature is written in a cursive style with a large, prominent "E" and "R".

E. I. ROBERTS
District Engineer

EIR:wjk
Attach.

WASHINGTON STATE DEPARTMENT OF HIGHWAYS
INTERDISCIPLINARY TEAM STUDY



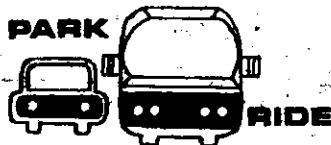
Dear Resident:

A member of the Department of Highways staff called to pick up the Park & Ride Survey Questionnaire left at your residence last week. We were unable to contact you at that time. In order to insure adequate representation for your area, would you please mail your completed questionnaire in the attached postage-paid envelope at your earliest convenience.

Thank you for your cooperation.

E. J. Roberts, District Engineer

WASHINGTON STATE DEPARTMENT OF HIGHWAYS
INTERDISCIPLINARY TEAM STUDY



Dear Resident:

The Department of Highways has organized an interdisciplinary team to study the design and location of a Metro Park & Ride lot in your area. A member of our staff has called at your home to distribute a survey questionnaire but was unable to contact you. In order to insure adequate representation, would you please complete the attached questionnaire and return it in the attached postage-paid envelope at your earliest convenience.

Thank you for your cooperation.

E. J. Roberts, District Engineer

**GUIDELINES FOR THE
OPERATION OF
INTERDISCIPLINARY
TEAMS**

Prepared by

**WASHINGTON STATE HIGHWAY COMMISSION
DEPARTMENT OF HIGHWAYS**

In Cooperation with

**U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION**

OCTOBER 1975

1. Report No. DOH 25.4	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle GUIDELINES FOR THE OPERATION OF INTERDISCIPLINARY TEAMS		5. Report Date October, 1975	6. Performing Organization Code
7. Author(s) Washington State Department of Highways		8. Performing Organization Report No.	
9. Performing Organization Name and Address Washington State Highway Commission Department of Highways Highway Administration Building Olympia, Washington 98504		10. Work Unit No.	11. Contract or Grant No. HR-527
12. Sponsoring Agency Name and Address Washington State Highway Commission Department of Highways Highway Administration Building Olympia, Washington 98504		13. Type of Report and Period Covered Final - Guideline 10/1/72 - 6/30/76	
15. Supplementary Notes		14. Sponsoring Agency Code	
<p>16. Abstract</p> <p>In the State of Washington interdisciplinary teams have been formed for transportation planning for all projects having a major social, economic or environmental impact. The responsibilities of the teams are as follows: (1) Conduct in-depth studies; (2) Develop and implement a community involvement program; and (3) Develop a departmental recommendation for solutions to transportation problems. The interdisciplinary teams that have been used have had a wide variety of disciplines represented. The purpose of this document is to outline procedures and discuss methods that will assist interdisciplinary team members and project engineers in carrying out their responsibilities. Part I deals with the organization and responsibilities of the team and of its members. Part 2 sets forth ten steps recommended for teams to follow in carrying out their charge. Part 3 discusses some of the practical operating problems which teams have experienced and recommends possible solutions. Methods to achieve more effective interaction among interdisciplinary team members are discussed. Also, suggestions by which technical studies and community values and attitudes can be integrated into the team's final report are included.</p>			
17. Key Words Interdisciplinary Team Operations, Organization and Responsibilities; Design Team Studies; Study Plan Development and Methodology; Team Management		18. Distribution Statement	
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GUIDELINES FOR THE OPERATION OF INTERDISCIPLINARY TEAMS

Foreword

The purpose of this document is to assist interdisciplinary team members and project managers carry out their responsibilities. It supplements both the Action Plan* and the directive of the Washington State Department of Highways, Interdisciplinary Approach to Project Development, No. D 31-12 (PP), issued May 1974, as thereafter amended. All persons involved in the interdisciplinary efforts should be familiar with these official departmental documents.

Unlike the other two documents, these guidelines are recommendations rather than rules of procedure. They incorporate the experience of teams which have already been activated as well as the collective experience of the authors. The recommendations in this report may not apply to all situations. However, a team should carefully consider each recommendation and deviate from it only if it determines that some other course of action is preferable given the particular circumstances of its assignment.

Part 1 deals with the organization and responsibilities of the team and of its members. Part 2 sets forth ten steps recommended for teams to follow in carrying out their charge. Part 3 then discusses some of the practical operating problems which teams have experienced and recommends possible solutions.

*An Action Plan for Social, Economic, and Environmental Consideration in the Planning, Location, and Design of Highways, State of Washington, Department of Highways, October, 1973.

Introduction

Interdisciplinary teams are relatively new in highway planning. However, they have been used for some time to solve complex planning problems in other fields. As stated in the Action Plan (page 3):

Increased concern in recent years over the effect of highways and other transportation facilities on people and the environment has emphasized the need to involve persons with other skills in addition to engineering in the administrative process of transportation planning, location, and design.

These guidelines are intended to facilitate team operations. While one or more members of the team may have had prior experience in a "task force" or a "design team" assignment, it is likely that some members have never participated in an interactive planning process with professionals from outside their own fields. In either case, all team members should understand the specific responsibilities of the team as a whole and of each of its members.

Recent research in group dynamics indicates that interactive groups solve complex problems more efficiently than do groups composed of individuals working independently. Of course, many small subtasks are more efficiently performed by individuals working alone. The interdisciplinary approach to project development utilizes the interactive process, but also allows individual independent contributions to the planning process when appropriate. Therefore, the guidelines which follow describe the steps in a successful interactive process. The format should provide the team with a solid framework around which to organize its efforts. The steps defined in these guidelines are more appropriate for major projects or for systems planning studies. Nevertheless, much of the material applies to planning for any project.

The procedures followed and the studies undertaken during the current financial crisis in highway construction, most by interdisciplinary teams for projects in the design stage of development will vary somewhat from those in the location stage. However, the logic of the ten steps described in this document is not necessarily modified. The approach of the various reports, including the Environmental Impact Statement, will vary only according to the stage of the project; the team's basic responsibilities and the sequence in which they are carried out remains essentially the same.

PART 1

ORIENTATION

RESPONSIBILITIES OF THE TEAM

The directive concerning interdisciplinary teams indicates that the team is responsible for performing the following basic duties:

1. The conduct and consideration of in depth studies of all pertinent factors;
2. The development, implementation and utilization of a community involvement program, and
3. The recommendation of solutions to the transportation problems.

The team is a "problem solver", not a "solution justifier". It must do more than identify impacts. Its responsibility is to apply its collective professional competency to the assigned problem(s). The responsibilities of the team are collective. The team, as a whole, must carry out each of its three basic responsibilities.

Studies

In undertaking the required in depth studies, some tasks may be accomplished efficiently by the independent research efforts of a single team member, or perhaps those of a subcommittee of the team. However, in "doing his own thing" the team member will be working within the context of total team effort. The team then meshes its creative interactive group efforts with the essential individual contribution of its members. The end product of the studies undertaken must not be an anthology of those independent efforts but rather a totally integrated report in which the interaction of the team is reflected.

Community Involvement

The team and its members are official representatives of the Highway Department responsible for developing highway plans for consideration of the Washington State Highway Commission. They serve as a vital communication link with the public. Just how they are to carry out this responsibility, collectively and individually, must be carefully determined. The development and implementation of a community involvement program is a significant part of their assignment. A separate directive entitled "Community Involvement in Project Development", D 31-18 (PP), has been issued concerning this important subject and guidelines have been prepared.

Recommendations

The team as a whole must ultimately formulate recommended solutions to transportation problems. The interdisciplinary approach with the inclusion of community input, should lead to a consensus on the recommended course of action. In reality unreconciled minority opinion may persist. It is not the duty of the team to suppress such opinion; if the team is unable to reconcile its differences, recommendations of the minority should be included in its report to the Department.

ORGANIZATION

The District Engineer creates the team by following procedures outlined in the directive on interdisciplinary teams. His proposal is reviewed and approved by the appropriate Assistant Director of the Department. Once created, the team organizes itself and elects officers. The role to be played by the team's officers and members suggests the form of its organization.

The Chairman

The chairman must be a leader. He must involve each team member in the team activities, if the team's potential is to be realized.

The chairman must also be (1) an overall "productivity watchdog", (2) a facilitator of intra-team communications, and (3) a motivator and coordinator of individual efforts. During team meetings, which he conducts, he is responsible for keeping the discussion alive and relevant. He must guide the discussion to a logical conclusion and see that "the sense of the meeting" is articulated. In those cases where critical issues are at stake the chairman should conclude the meetings by requiring the team to (1) set forth the consensus of the session and its implications for the team, and (2) identify decisions reached and the next course of action.

The chairman must serve as spokesman for the group, especially at public meetings. Moreover, it is important that he participate directly in planning the community involvement program. For example, preparation for public meetings must include much more than a "briefing" just prior to the appointed hour. He must participate in developing the agenda. In selecting a chairman, team members should consider his abilities as a public spokesman and coordinator as well as his ability to conduct meetings.

A chairman can assume these roles and responsibilities without dominating the team or dictating its activities. While domination of the team by a strong leader may be a real danger, autocratic personalities tend to conform to group consensus; if the majority of the team is determined to make the team approach work, its efforts can overcome the resistance of the chairman or any other dominating person. Those who do not contribute to the total team effort are more quickly corrected by subtle social control than by formal censure.

The Project Engineer

The project engineer may be a team member or the District Engineer may appoint another engineer to the team leaving the project engineer free to provide the extensive support activities required. The project engineer who has the responsibility for the project will serve as administrative officer or executive secretary for the interdisciplinary team and, in this capacity, will expedite the project, provide staff assistance for members as required, undertake engineering studies, together with the appropriate team member, coordinate and/or prepare reports, record assignments and decisions and review interdisciplinary team actions for conformity with existing policies and standards.

The project engineer also makes available to the team "the resources of the Department", including among other things, maps, reports and statistical data needed by the team and its members. The team should establish a means for monitoring the collection of data and the exchange of information among team members.

Liaison Advisors

The relationship of the team to its official advisors needs consideration in a more general sense than is provided hereinafter or in the directive, D 31-12 (PP). Each team has liaison advisors from the appropriate Assistant Director and from the District Engineer. The directive states that the representative designated to serve as liaison to the team "...will not serve as a member of the interdisciplinary team..." (His review) "...is not intended to impair the freedom necessary for the interdisciplinary team to conduct a comprehensive and objective study and recommend the course of action to be undertaken. However, if deviations from standards and policies are contemplated

by the interdisciplinary team the representative will so inform the team." The team must obtain approval before alternatives which deviate from policy can be studied further. The departmental advisor is not a referee. He is there to monitor team progress and to provide interpretation of departmental policy.

In addition to the liaison representatives from the Department of Highways, the team should consult with appropriate professional personnel of other state and local agencies. For example, local city and/or county public works and planning officials must be consulted continuously throughout the overall process. Team meetings in which such persons are directly involved in the interactive consideration of design (planning) factors are both appropriate and desirable though not specifically mentioned in the pages which follow.

Team Members

Each team member has been selected because he possesses an area of competency essential to solution of the team's assigned problem(s). Each, then, should anticipate undertaking one or more in depth studies in which he applies his professional skills to some aspect of the problem(s). However, his responsibilities as a team member (for supporting the collective responsibility of the team) require an approach which may be unique to him; team members cannot limit their participation to technical studies.

Each team member must actively participate in all team activities including:

1. The review and approval of the study plan, including a community involvement plan;
2. Participation in the implementation of the community involvement program;

3. The evaluation of various courses of action, and
4. The development of final recommendations.

Team members are selected primarily on the basis of their capability to undertake independent research assignments or to contribute their expertise to the project plan, but individual team members have an even greater responsibility to facilitate the effective operation of the team as a whole. The most important role for each and every one is that of team member.

PART 2

STEPS IN TEAM OPERATIONS

OBJECTIVES OF THE FIRST TEAM MEETING

The first meeting of the team must set the stage for its subsequent operations. It is extremely important that prior to this meeting the team members understand the interdisciplinary approach, why each member has been selected to serve, and the nature of the problem(s) to which the team will address its efforts.

Each member of the team should receive notice of his appointment, a directive to attend the meeting, and the following materials:

1. Directives on Interdisciplinary Teams and Community Involvement Programs.
2. The Action Plan.
3. These guidelines.
4. A general description of the problem(s).
5. A tentative agenda for the first meeting.

As a general rule, it is preferable that detailed reports and related information about the project not be distributed prior to the meeting. There are two sound reasons for this; first, the inclusion of too much material may prevent some team members from giving adequate attention to the basic documents, and second, it invites independent consideration to problem solution which may subsequently interfere with the effective utilization of the interdisciplinary approach. The following outline suggests the topics the team might well consider at the first meeting:

1. The Action Plan process and the general role and responsibility of the interdisciplinary team.
2. The assigned problem.

The District Engineer or his representative should present the team's assignment. He also should brief the team on the history of the project and present needs. However, he should avoid presentation, or even identification, of alternative solutions at this time. If these alternatives are pertinent to the assignment, there will be more appropriate occasions to discuss them. The project engineer should identify background materials such as maps and traffic data which the Department has available, and explain procedures for obtaining them. Similarly, he should discuss the services of personnel of the Department and other resources, which the team may call upon.

3. Team discussion of its operations and responsibilities.

Notes: Roberts' Rules of Order does not facilitate the interactive problem solving process. However, between meeting communications, efficient utilization of data, and distribution of working materials will be aided by the establishment of some kind of group procedures. Nevertheless, normally, no attempt to make final decisions with regard to procedures should be made at the first meeting. The basic purpose of that meeting is to relate the interdisciplinary approach to the team's assignment.

The team should leave the meeting with a sense of how the interdisciplinary approach can be used effectively to carry out its assigned

responsibilities. A nondirective group discussion among team members along with an opportunity to ask questions of the District Engineer or his representative should consume a majority of the meeting time.

4. Review of study plan.

Preferably the project engineer will have a draft of a study plan prepared to give the team members at the first meeting. The team members should review the draft plan and be prepared to discuss and adopt a study plan at the second meeting of the team.

If the interdisciplinary approach is to work, all team members must be involved in the process from beginning to end. Because interactive consideration of all factors achieves the best solution, no member can avoid the responsibility for participating in study design. The purpose of a study plan is to set forth objectives and the process by which these objectives will be accomplished.

The second team meeting presents the first opportunity for team members to engage in interactive problem solving. Some will have had prior experience in such activities and be more familiar with organizing comprehensive research projects. Such members should take the initiative to assist the group, but should take care not to assume the decision-making responsibility reserved to the team as a whole.

The chairman can direct the discussion to an articulation of "goals and objectives" which relate the project to its history and to its function in the larger transportation system. Goals should be considered from a number of other perspectives as well (i.e., the future development of the community, the health and safety of the public, etc.). The team will find it advisable to establish a hierarchy among broad, long range goals and more specific short

term objectives. At this time the team should identify a number of the most important questions that must be answered regarding the project under consideration. These questions will vary considerably for various projects.

STEP 1 - DEVELOPMENT OF STUDY PLAN

Since the study plan deals with specific functions and tasks necessary to complete the study, the team must decide who will have responsibility for what.

Since training and experience in various disciplines may logically equip more than one team member with the expertise to satisfactorily study various factors, a "responsibility table" indicating the specific tasks of each team member will consider should be utilized. (See Exhibit I) Assignment of responsibilities will usually follow without difficulty because of the background of the various team members. However, if conflicts arise, the team chairman in deliberations with the rest of the team should decide who will have responsibility for which items.

However, before tasks are assigned to individual team members each member should answer the following questions about the factors relevant to the project:

1. With which factors would he like to deal?
2. Which factors are most appropriate to his discipline?
3. Which team member can best address a specific planning factor on this project?
4. On which factors can he provide assistance to project manager and other team members?
5. For which might he require assistance from another member?

A member's answers to these questions should accurately reflect his own strengths and limitations.

A team as a whole must devote adequate resources to each analytical issue before it, but it must also be careful to avoid duplication of effort. The team's effort should produce a clear statement of each member's area of responsibility within the study plan. However, this document need not include specific detailed task assignment.

The "area of responsibility" concept applies to the technical requirements for independent research and analysis and not to the broader participation in team responsibilities. For example, the planning and administration of the Community Involvement Program may be the "area of responsibility" for only one or two team members; yet all must help implement that program.

The Community Involvement Program is a basic component of highway planning. Thus, this element of the study plan, perhaps more than any other, requires the attention of all team members as well as the one assigned direct responsibility for its preparation.

STEP 2 - DEVELOPMENT OF DETAILED WORK ASSIGNMENTS

Having determined each member's area of responsibility, the team must then consider the interrelationship among the many tasks required to complete the assignment. The tasks required in planning for and implementation of the Community Involvement Program must be integrated into the total schedule of activities.

A general work flow diagram, such as those illustrated on pp. A-37 and A-38 of the Action Plan, can be used to formulate the overall schedule. However, the sequential ordering of detailed tasks and activities for a planning or design

project too often wastes time; inevitable shifts will occur throwing the whole schedule off when there is no time to redraft it.

A dynamic scheduling process is needed, however. As part of its own internal management, the team needs to establish such a schedule to review it systematically limiting detailed tasks to the immediate steps ahead. As a general rule, revision should be undertaken following Steps 4, 5, 7 and 8. A general discussion of team and individual member progress is an important part of schedule revision.

STEP 3 - INDEPENDENT INDIVIDUAL STUDY

Researchers in most disciplines initiate a research (or study) plan by analyzing the relevant information. They may review the relevant information already provided on the project; collect data from secondary sources, and generate primary data. While this step emphasizes independent individual research, lines of communication among members should be maintained. Team members should share facilities, information and ideas and should coordinate contacts so that several team members do not ask the same agency or organization for the same data. Since a major objective of the Community Involvement Program is to both give and obtain pertinent information from the citizens of the community, this important resource must not be overlooked. Community inputs are a critical and essential part of the information required by the team.

Interdisciplinary team members must utilize community values and opinions in evaluating various causes of action so it becomes important to include community data within studies that are undertaken.

STEP 4 - SYNTHESIS OF PRELIMINARY RESEARCH FINDINGS (presentation of written and oral reports)

This step marks a critical point in team operations. It permits each member to describe to his co-workers the salient findings of his individual research. The presentations should be made at one continuous meeting which should not be scheduled unless all members are prepared to make their oral presentations. Written reports should be distributed one week prior to the meeting date.

The team should prepare for an all day meeting at which everyone will make his presentation. Each presentation should be followed by uninhibited critical discussion.

The team should strive to maintain a continuity of interests; it should conduct no other business until it has accomplished the objectives of this step. If it is not possible to complete this step by the end of the normal working day, the team should reconvene the following morning. In general the following agenda is recommended for the meeting.

1. Statement of Procedures.

The chairman should state the ground rules for the meeting which should have been determined ahead of time, and should indicate the order in which presentations are to be made. No time should be spent reconsidering these ground rules.

2. Presentation of reports by physical science disciplines.

Each member should present his oral report and answer questions on his presentation as well as on his written report. Before proceeding to the next presentation, each member of the team should state in his own words the thesis of the presentation and discuss it with the member who made that presentation.

3. Presentation of reports by the social science disciplines.
this should follow the format in 2 above.
4. Presentation of reports by the design disciplines.
This should follow the format in 2 above.
5. Identification of deficiencies or need for additional work.
If there are deficiencies or conflicting elements in the various reports, these should be discussed and openly debated. Conflicts or deficiencies should be resolved expeditiously. If the team cannot resolve the conflict, the matter should be referred to district managerial personnel.
6. Discussion of interrelationships and overall implications of the presentations.
The meeting must come to a logical conclusion. A mandatory end product is a summary of the key planning and design factors, and of the potential sensitive environmental conditions which must be considered by the team. This summary must be included in the minutes and, if necessary, discussed at the subsequent meeting.

STEP 5 - DEVELOPMENT OF ALTERNATIVES

Once the team understands the problem(s) it must resolve together with the major constraints on their solution, it is ready to begin the creative phase of its operations. By this point the team should have established its capability for dynamic interaction. If so, members will engage in the professionally satisfying kind of experience marking the successful use of the interdisciplinary approach.

Step 5 should be initiated with a meeting at which the team will articulate and consider the major alternatives. It is recommended that the following rules apply to such a meeting:

1. Every member should be given adequate but not excessive time to present his ideas.
2. Members should express their ideas freely and should not be criticized until the ideas are fully developed alternative solutions.
3. Each member is encouraged to elaborate upon every idea expressed.
4. The team as a whole should "scan the broad spectrum" of possible alternatives and should logically apply each idea to the problem before attempting any specific evaluation.

At this point in the planning process all alternatives are potential means to achieve the broad goals adopted in Step 1. No attempt should be made at this point to resolve all the detailed problems attendant to specific design of the facility.

Once the team has articulated all the possible alternatives it should reduce them to a manageable number of practical approaches by combining ideas and/or eliminating redundancies. The objective is to produce significant unique and feasible alternatives for achieving the goals and objectives adopted in Step 1.

While alignment of highways within a transportation corridor is one differentiating characteristic between alternative solutions, the team should not overlook others. For example, alternative modes (re: combining automobile with rail or bus transit; separating trucks and buses from passenger vehicles, etc.) or different roadway levels (i.e., depressed, at grade or elevated) may

apply in some situations. Further, the "do nothing" and "up-grading of existing facilities" are valid alternatives which nearly always must be retained through this step. The total number of major alternatives to be developed will vary with the complexity of the problem. Generally, no less than three should be developed. The maximum number should be governed by the ability of the team to develop clearly unique alternatives. However, feasibility is a primary factor in determining the number of alternatives, as many clearly unique solutions are not feasible and their further study would be purely academic.

STEP 6 - MEASURE IMPACTS

Once the team has selected the major alternatives that it will consider, each must be developed to a point where it is possible to measure its potential impacts.

Within the areas of his designated responsibility, each team member should now measure, by independent study, the impacts of each major alternative. As this step proceeds, coordinated efforts between members will become necessary. A good procedure is as follows:

1. Each member determine, define and quantify the primary impacts of each alternative within his area of responsibility;
2. Exchange this information in order to make sure that secondary impacts can be identified;
3. Each member determine, define and quantify the secondary (and lower order) impacts of each alternative, and
4. Each member complete his written report on impacts.

STEP 7 - PRESENTATION OF WRITTEN AND ORAL REPORTS REGARDING THE IMPACTS OF EACH ALTERNATIVE

The interdisciplinary approach succeeds only when each member shares his knowledge with the team as a whole; another all day meeting is needed to insure this mutual education. In planning for the meeting the team should consider the time required, particularly if many reports are to be given and several alternatives are to be considered.

Rather than scheduling separate meetings at which different sets of members make their presentations, the following format is recommended:

1. Each team member, in turn, describes the impacts of the first alternative only. A question and answer period and open discussion should follow each presentation.
2. The team then summarizes and records the probable environmental and human ecological consequences of the first alternative.
3. Each of the remaining alternatives is given the same consideration. The meeting may be adjourned to the next available meeting time as may be necessary, provided that each meeting is concluded with the final summarization of an alternative.
4. At the final meeting (or group of meetings) in the sequence each member evaluates the different impacts among all the alternatives, followed again by a question and answer period, discussion and summarization.

The presentations and discussions may require more time than can be set aside for continuous sessions, but an effort should be made to do this in one ongoing meeting so that all factors concerning each alternative can receive attention

in the team's evaluation process. Some factors tend to be overlooked or the importance diminished by lapse of time between meetings.

After all the presentations have been made and appropriately discussed, each team member should be required to prepare an independent written report summarizing all the presentations made, including his own. His statement should express his own understanding of the probable consequences of each alternative. These reports should be exchanged and carefully studied by all team members.

The final meeting of this step should be devoted to preparation of a consolidated statement. In order to faithfully implement national environmental policy, the team must be able to disclose all the relevant impacts of each alternative.

STEP 8 - EVALUATION OF ALTERNATIVES (Looking at the whole)

The team should systematically evaluate the alternatives,* carefully considering all the significant factors. The end product of evaluation should not be a decision; rather, it should be a precise articulation of the advantages and disadvantages of each alternative.

In the preceding step the team analyzed impacts utilizing the independent technical research of each member. In the final analysis the team cannot evaluate alternatives satisfactorily without interpreting the community values generated by the Community Involvement Program. To be complete, evaluation requires the consideration of three factors, often overlapping and interdependent:

1. Probable impacts;
2. Planning and design factors, and
3. Community goals and objectives.

* A separate set of guidelines describes Evaluative Methods.

Before completing the evaluation process the team should assure itself that it has duly considered all three.

In the experience of nearly all teams activated in this state, the evaluation phase has stimulated the most intensive group interaction. Therefore, it is highly probable that the team will need little direction in order to fulfill this step's requirements. There is a danger that the team will become more concerned with the technique itself than with its purpose and end product. Whether or not a formal scoring technique is used, evaluation should result from team interaction. Although members should be permitted and encouraged to discuss the advantages of each alternative, the team should be reminded that uninhibited support for (or opposition to) any given alternative thwarts the evaluative process.

A good approach to evaluation is the systematic discussion of the planning factors (see Appendix B):

First: Relate each factor, one at a time, to the alternative.

Second: Evaluate each alternative, one at a time, with respect to all the factors.

A valid and precise articulation of the advantages and disadvantages may be accomplished at one meeting if information is available. More independent research might well be required to complete this step. However, in accord with the principle of the interdisciplinary approach, the end result must represent a team effort.

After evaluating the alternatives, the team may drop one or more of them. For obvious reasons the "do nothing" alternatives should be retained, however. Elimination of alternatives should be based primarily on feasibility factors and should be clearly documented.

STEP 9 - PLAN REFINEMENT

This critical step in the planning process must not be overlooked in the rush to meet deadlines or to respond to political pressures for a decision.

It includes:

1. Individual Study

Within his area of responsibility each member must, (a) attempt to identify means for eliminating or reducing the disadvantages, and (b) design measures to mitigate the adverse impacts of each alternative.

2. Team Consideration and Synthesis of Alternative Plans

A substantive interactive effort of the team is needed to complete the planning process. The team must select detailed solutions to design problems and recommend mitigating measures. Such recommendations might include actions and policies which do not relate to design of the facility or which go beyond the jurisdiction of the State Highway Commission. In the latter case justification must be clearly set forth and the team must be sure that the agency having jurisdiction over the recommended policy also has the legal authority and resources necessary to implement it. In addition, the activities of this step must reflect the results of community involvement program.

STEP 10 - REPORTS AND PRESENTATIONS (The end product)

The preceding nine steps are designed to produce the reports and presentations required by the team's assignment. Adequate recording of team activities and documentation of individual research along the way should simplify preparation of the team's reports. Even though prior efforts have been directed toward integration of all work, considerable collective and individual editing

may be required to assure continuity of style and format. Here again, editing decisions need to be based on the interaction, give-and-take of the team as a whole.

The community involvement program, if successful, should result in direct citizen contributions to the team's reports.

Generally, these are team's major end products:

1. The Draft Environmental Impact Statement
2. In person presentation of team findings and recommendations
3. The team's written report of recommendation
4. The Final Environmental Impact Statement

The team's recommendations might precede the public hearing or be last in the order. However, the team should not issue its recommendations until it has received and considered all responses to the Draft Environmental Impact Statement.

PART 3

TEAM MANAGEMENT

The interdisciplinary approach is preferred as a means of achieving departmental planning policy goals. Nevertheless, it is still experimental and is new to many professionals. This section describes some of the operating problems which teams have experienced and recommends ways to solve them.

Definition of Roles

When interdisciplinary teams are formed, the persons involved (administrators and team members) each have opinions and expectations regarding the operation of the team and anticipated results of the team's efforts. Frequently these expectations vary considerably. If the team is to function satisfactorily, it is essential that the entire team process and the role of management in this process be discussed in some detail when the team is organized.

Departmental Directive entitled "Interdisciplinary Approach to Project Development" (D 31 - 12 (PP)) outlines the policy of the department regarding the basis process to be followed and carefully defines management and team responsibilities. It is advisable for the District Engineer or his representative and the team to review the process together at the time the charge is given to the team. Since this team process is of basic concern to many people, it is essential that an atmosphere be created in which everyone feels free to raise questions and issues, to discuss them and suggest ways by which problems can be resolved. Answers must be provided and guidance given to the team by District management. This can be done most effectively if team members know

that their suggestions and concerns have been considered before procedural decisions are reached.

The District Engineer has administrative responsibility for the study and the team. The team should apply its collective professional competence to study the problem assigned to it, to develop a community involvement program and utilize the opinions received from the community in its deliberations and then make a recommendation of action to be taken by the Department. The primary role of the team is to seek solutions to some rather complicated problems. Emphasis should be placed upon this problem solving responsibility and not permit the preparation of reports or procedural matters to become the actual objectives. Team members will contribute studies and write sections of reports as requested but the primary responsibility for the preparation of environmental impact statements and design reports rests with the District staff.

Mutual Understanding of the Purpose of the Study

When an interdisciplinary team is created, the District Engineer outlines the purpose of the study for the team and he provides some parameters for the team to follow. Numerous questions usually arise from team deliberations and discussions with the community. One important aspect of team management, therefore, is to create an atmosphere in which questions of team members can be discussed, basic problems analyzed and the team charge clarified. To achieve this goal one useful device for all concerned is for the team to outline basic questions or objectives which should be addressed in the study. One session devoted to this exercise early in the deliberations of the team brings about a much greater understanding of the purpose of the study and the limitations

and problems involved in pursuing the assignment. Such a discussion sometimes leads to changes in the team charge and to clarification of departmental policy regarding important factors the team must consider. In such a discussion, it is important that all team members participate. If each member does not, the team chairman should ask each member for specific comments.

Review of Objectives

When the study plan is prepared, the objectives and purpose of the study will be included. As time progresses, the original objectives of important questions to be addressed quite easily become obscured by various conditions that arise. The chairman, project engineer and liaison officers, therefore, need to reiterate these original objectives as frequently as necessary. Otherwise the time of the team can be utilized considering details or other subjects that contribute little to the basic purpose of the study.

When situations arise that make it essential that the original charge to the team be reconsidered, team managers should seek clarification and when decisions have been made the team should be informed. The team should feel free to request clarification whenever necessary. The most effective relations can be maintained between district management and the team if opportunities are created for discussion of problems throughout the various phases of the study.

Meeting Commitments

When each team is organized, the study plan will include time schedules for completion of the various steps in the study process. A key factor in

team management is to report the progress of the study to the team frequently thereby informing the members how well the actual progress matches the completion dates and the budget to which the team is committed. Team members want to make the effort successful and meet commitments. If time allotted to complete various tasks proves to be unrealistic (too little or too much), adjustments should be made on the overall schedule to reflect realistic conditions. Success in meeting obligations motivates the team and, conversely, failure to meet expectations or a lack of concern about schedules by management encourages team members to become unconcerned about the stated obligations of the team.

Progress can only be made if each team member shoulders his share of responsibility. When a team member fails to meet his obligations, the team chairman and project engineer should not hesitate to have a personal discussion with the team member and if the team member cannot devote sufficient time and effort to complete his assignments, he should resign so that someone who can devote necessary time can be appointed.

Managers should never underestimate the value of their recognition of successful efforts by the team. Teams need to be motivated and nothing contributes to success more than achieving established objectives and then receiving recognition for such achievements.

Meeting Technical Deficiencies

Development of the study plan is the process whereby the team determines how it will apply its collective professional competency to the assigned problem(s). A significant part of that process is to state each member's technical area of responsibility so that more specific task assignments can then be made. As noted in a preceding section (under Steps 1 and 2), it is necessary to identify overlapping professional interests and proficiencies in order to avoid duplication of effort and operational conflicts. In so doing the team may also find gaps in the spectrum of the team's expertise which require additional technical support.

For example, there may be a need to confront an unforeseen problem area not now covered by an appropriate discipline represented on the team. Or some problem may arise (perhaps at a later point) which requires a highly specialized technician within a discipline otherwise ably represented on the team. Gaps may also result from the resignation of a team member whose discipline needs to be represented.

These gaps can be met in either of two ways:

1. A new team member is recruited, brought on board and made a full team member, or
2. A competent professional is selected to assist the team and given a very limited and exactly defined assignment.

The decision to add a new member or to engage a short-term consultant does not solely depend on the specialized knowledge required to "fill the gap." A more important consideration is the relationship of the area of responsibility to

the specific problem and how this relates to alternatives which must be considered in each of the other areas of responsibility represented on the team.

Putting it another way, if one or more alternative solutions to the specific problem are likely to have a direct effect on specific alternatives to be considered by more than one team member, then the professional assigned the task should be a member of the team. If, on the other hand, the probable alternative solution to the problem relates to the area of responsibility of only one other team member, a special limited-term consultant would be appropriate.

When the Team is Too Large

Research in group dynamics is inconclusive with respect to optimum interactive group size. Under ideal, experimentally controlled circumstances, groups as large as thirty in number have been capable of solving complex problems. However, such cases are rare, and most students of the subject suggest that five is an optimum number; efficiency declines rapidly as the number of members increases beyond six or seven.

However, experience to date indicates a desire and probable substantive need for more than seven disciplines to be represented in some cases. The principle of interdependence states that any discipline whose involvement will alter the alternatives considered by other disciplines should be represented by a full member of the team.

Until the more critical interactive phase is entered (Step 5 above) it may not become evident that the team is too large. However, from the first

meeting the chairman should devise means for involving the entire team and if participation by team members is not forthcoming then the chairman should seek special assistance from personnel in the Planning Division of the Department of Highways or elsewhere in group dynamics.

Team Interaction

Some simple measures may facilitate interaction. The chairman and the project engineer should refer questions or comments regarding a subject that is the responsibility of a team member to the team member concerned rather than providing answers or opinions themselves. Likewise, the chairman should ask questions and suggest items for team discussion rather than announcing conclusions that he has reached. If team members are hesitant or reluctant to state their opinions concerning matters of import, each team member at the meeting should be asked to give his opinion before decisions are reached. If the team can deliberate in a relaxed, somewhat informal situation, interaction can be facilitated. Sincere comments and questions of team members should be treated with respect even though the proposal or suggestions may not appear to be practical to the person conducting the meeting.

Very often confusion results because of the inability of team members to convey their concerns in a manner that is meaningful to other disciplines. In such instances, the team chairman or another team member should simply seek clarification by asking the following question: "If I understand you correctly, you believe that" (then state the comment or concern as you heard it). Such a replay often helps clarify the real meaning the person wants to convey.

Another factor which often destroys meaningful interaction is the failure of the team chairman or whoever is conducting the meeting to keep the conversation on the subject under consideration and to define adequately the purpose of the meeting and the importance of the matters under consideration. Each meeting should have an agenda and the objectives to be reached should be clearly understood.

Care should be given to the subjects that are brought before the team, and whenever possible, an individual member should be given the responsibility to develop specific items and report findings and conclusions to the team for their discussion and approval rather than attempting to waste time and bore the entire team by considerations of subjects that could best be handled by one member.

Physical arrangements for meetings are important. Team members should sit around a table and every person should be able to talk directly to every other person.

A subcommittee of the team can most efficiently develop the Community Involvement Program. However, care should be taken to insure involvement of all team members in appropriate phases of community involvement.

Differential Work Load

As the study plan and subsequent detailed work assignment are developed, differences in the "level of effort" required of each team member will become apparent. The project engineer will need to confirm the allocation of time required for each departmental employee on the team. Appropriate measures must be taken to insure that the team member will not be assigned conflicting or

higher priority responsibilities. While ancillary staff support to team members may be appropriate and necessary, they must accept prime responsibility for their team activities. This responsibility includes their technical work assignments as well as attendance at team meetings. If a team member is an independent contract consultant or a representative of a consulting firm, the contract for his services must insure the "level of effort" necessary to fulfill his obligations.

Since "level of effort" cannot be absolutely defined at the onset, flexibility in personnel management and contract administration is essential. Differential work load should not be a management problem of the team. It should be handled by the District Engineer. The team should recognize this and should inform the District Engineer of its changing manpower needs as they are anticipated.

Improving Efficiency of Interdisciplinary Teams

One of the basic concerns about using Interdisciplinary Teams to undertake studies, is the cost and the length of time that such a process involves. The interdisciplinary team process does not need to involve more time and expense than would otherwise be required if the team is managed efficiently. Improvements have occurred in team efficiency as the department has gained more experience in using this approach to planning and design.

Time and cost can be reduced considerably if tasks are segregated early in the process so that only those that require the attention of the full team are scheduled for meetings, with the remainder being accomplished by the project

engineer and his staff or by individual team members. Agendas of team meetings can easily become cluttered with items that are not necessary for the entire team to consider. Tasks such as the detailed planning for community involvement activities, preparing newsletters, solving technical problems of specific disciplines in undertaking studies, and reviewing detailed data that do not relate directly to problems under study can be undertaken by one team member and/or the project engineer and reported to the entire team when necessary rather than involving the total team in the process. The task of making up the agenda is shared by the team chairman and the project engineer. Team members should be invited to submit items that are of importance to the entire team. Agendas should be followed carefully.

Teams can review documents such as the study plan or the report of team recommendations together and make worthwhile contributions. The preparation of such documents should be left to the project engineer or assigned to a team member and then revised as necessary by the author after team review and adoption.

Meetings should be held when necessary but not routinely unless absolutely necessary as a way of reserving the time of busy team members. The entire team will need to become involved in several meetings at the beginning of the project. Later the team members will be involved in doing their own studies, and meetings should only be scheduled as necessary to maintain team continuity. When technical studies have been made and the community has been involved, another series of meetings will be required by the team to evaluate alternatives and make a preliminary recommendation. Later it will be necessary to

review comments from the circulation of the draft environmental impact statement and comments at the hearing and arrive at a team recommendation for use by the Department of Highways.

Resignation of Members

On almost every interdisciplinary team organized by the Department to date at least one member has desired to resign. We are not concerned here with the member who has personal or professional difficulties, but rather, with the member who feels either that his expertise is not essential to problem solution or, more often, that his responsibilities should be limited to his own self-directed independent research.

Any team member who has attended one or more team meetings, and who has had adequate opportunity to learn about (1) the interdisciplinary approach, and (2) the team's assignment, and who does not desire to assume full responsibilities of team membership, does not belong on the team. There is no such thing as a second-class member whose responsibilities exclude active participation in any aspect of the team's work. The team cannot afford to carry those who do not see the need to fully participate no matter how proficient they may be within their own area of expertise. In some instances the solution is to obtain technical studies of factors that are not of primary importance in the particular project under study and have the consultants discuss this with the team.

Role of Team Members

Each team member will need to understand all the basic issues and the major problems involved in taking various courses of action even though all

the disciplines are not involved in each case. Understanding problems and the consequences of taking specific actions are quite different from attempting to become an expert in each field. Therefore, the team must rely upon the technical competence of each member in collecting and evaluating data in his area of expertise. The team as a whole is in the best position to judge the relative importance of various planning and design factors in reaching a decision about the specific problem being studied.

Throughout the study process, it is necessary for team members to recognize that they are serving in various capacities and to distinguish between these various roles at appropriate times. When conducting studies, each team member is serving as a specialist in his field of professional competence. When he participates in community involvement activities, the team member attempts to understand the values and desires of the citizens of the area. When the team member serves as one of a group in reaching a conclusion concerning the best course of action to follow, he is seeking a solution which serves the best overall public interest, and therefore, he has a responsibility to place all factors in perspective. Serving as a member of an interdisciplinary team is a challenging role and team managers can help considerably by focusing the attention of the team on the role the team members must play at specific times in the team process.

APPENDIX

EXHIBIT I

Interdisciplinary team members are assigned the responsibility of conducting studies and making reports to the team and the public when necessary regarding each of the factors listed below. Since more than one team member may be involved, the task of data collection, analysis and preparation of reports are separated for each item. One team member may complete all three of these tasks or others may be assigned responsibility for one or more tasks. By using this format, the responsibility of the individual team members can be assigned quite specifically.

Factors

- | | | |
|-------------------------------|----------------------------------|--------------------------|
| 1) Acoustics | 11) Service to Areas | 14) Aesthetics |
| 2) Air Quality | a) Regional | 15) Construction Costs |
| 3) Water Quality | b) Local | 16) Maintenance Costs |
| 4) Wildlife | c) Route Continuity | 17) User Costs |
| 5) Vegetation | 12) Traffic | a) Vehicle Operation |
| 6) Geology | a) Regional | b) Safety |
| 7) Soils | b) Local Circulation | c) Time |
| 8) Drainage | 13) Design Factors and Standards | d) Comfort - Convenience |
| 9) Governmental Services | a) Project Traffic | 18) Economic Activities |
| a) Health | b) Right-of-Way | a) Tax impact |
| b) Education | c) Capacity | b) Employment |
| c) Utilities | d) Geometrics | c) Trade |
| d) Police-Fire | e) Restraints | d) Property Values |
| 10) Other Public Institutions | | |

- 19) Land use Impact
 - a) Existing & Projected
- 20) Comprehensive Planning Process
- 21) Urban Form & Development Patterns
- 22) Community Identity
 - a) Population Trends & Characteristics
 - 1) Stability
 - 2) Change
 - b) Neighborhood Characteristics
- 23) Displacement
- 24) Relocation
- 25) Disruption
- 26) Community Cohesion
- 27) Minority Interests
- 28) Community Values & Desires
 - a) Development of the area
 - b) Transportation Values & Desires
 - c) Perception of Problem
 - d) Solution of Problem
- 29) National Defense

DEPARTMENT OF HIGHWAYS

DIRECTIVE

No. D 31-12 (PP)

Effective Date:
May 27, 1974

H. R. Hoff
Assistant Director for
Planning and Research

INTERDISCIPLINARY APPROACH TO PROJECT DEVELOPMENT

I. INTRODUCTION

A. PURPOSE:

To provide guidelines for the implementation of a systematic inter-disciplinary approach in the location and design of highway capital improvements.

B. SUPERSESION:

IL 31-12 (PP), "Interdisciplinary Teams".

C. SCOPE:

The instructions contained in this Directive pertain only to projects in the location and design stages of project development. Routine maintenance operations are exempt.

D. REFERENCES:

1. M 31-10 (PP), "Action Plan"
2. PPM 90-4, "Process Guidelines (Social, Economic, and Environmental Effects on Highway Projects)"
3. D 27-50 (HE), "Consultant Authorization, Selection and Use"
4. D 22-34 (HR), "Approval of Limited Access Hearing Plans"
5. D 22-52 (HR), "Public Hearings"
6. D 22-52.1 (HR), "Public Hearing Procedures"
7. D 16-05 (SS), "Project Prospectus for Capital Improvement Projects"
8. D 31-18 (PP), "Community Involvement In Project Developments"
9. D 33-30 (PP), "Environmental Quality"

E. DEFINITIONS:

1. Group 1 Projects: The construction of highways, roads and streets in a new location, the major upgrading and reconstruction of existing facilities, or any other project that has major social, economic, environmental impact. Projects in this group usually have impacts that extend beyond the right-of-way line and are long lasting or permanent. Group 1 projects require hearings or advertising for hearing interest and the development of an environmental impact statement.
2. Group 2 Projects: The improvement of highways, roads and streets that require little or no additional right of way or limited construction on new locations. Projects in this group require either an environmental impact statement or a negative declaration according to the impact involved, and hearings may or may not be required.
3. Group 3 Project: Improvement of existing highways, roads, and streets or maintenance projects that do not involve any significant changes for property owners or the communities in which the project is located. These projects are anticipated to have minimal or no known adverse impact on social, economic and environmental factors. Generally hearings will not be required and a negative declaration may be filed.
4. Project Prospectus: A brief document prepared by the Washington State Highway Department to outline basic information relating to the needs for a highway improvement project. The Project Prospectus is prepared in accordance with D 16-05 (SP).
5. Initiating Document: A brief document prepared by the District indicating the District is ready to proceed with project development studies. It includes the project classification, disciplines requested to conduct studies and a copy of the Project Prospectus.
6. Study Plan: The detailed work plan of the Interdisciplinary Team including the community involvement plan. Preparation of the Study Plan, which is the responsibility of the Interdisciplinary Team, assigns responsibility to accomplish tasks and establishes timetables for their completion.
7. Interdisciplinary Team: A group of professional personnel, composed of individuals having expertise in the natural, social, physical and engineering sciences, and design arts, having responsibility to conduct indepth technical studies, establish and participate in a community involvement program and develop a departmental recommendation regarding appropriate course of action to follow.

8. Appropriate Assistant Director: For projects in the location stage, the Assistant Director for Planning, Research and State Aid; for projects in the design stage, the Assistant Director for Highway Development.
9. Hearings: Formal public opportunities for presentation of views prior to Department decisions as to courses of action to be taken i.e., corridor, design and/or access hearings. (See D 22-52 (HR), "Public Hearings" and D 22-52.1 (HR), "Public Hearing Procedures")

II. RULES

A. PURPOSE:

The Department of Highways uses a systematic interdisciplinary approach to provide a means by which pertinent expertise is utilized in an integrated manner to determine transportation requirements, identify impacts, and seek the best possible solutions to problems. Interdisciplinary functions are not to be considered as separate and distinct from the functions performed by the engineering personnel in the Department. Engineering, social, economic and environmental studies and resources are integrated to ensure that decisions are made in the best, overall public interest.

B. OBJECTIVES:

The systematic interdisciplinary approach has three basic objectives:

1. Obtain meaningful studies of all factors related to transportation planning and design by qualified personnel, and utilize the information derived from such studies in the decisionmaking process;
2. Assess the values, goals and desires of the public and consider these factors in technical studies and in the decisionmaking process;
3. Develop a Departmental recommendation based upon technical studies and community involvement concerning the appropriate course of action to follow.

C. DISCIPLINES INVOLVED:

1. Areas of study

The interdisciplinary approach utilizes professional personnel trained in the appropriate natural, social, physical and engineering sciences and design arts to study and evaluate the impact of proposed highway capital improvements. The personnel selected for an individual project will depend on the characteristics of the project. Personnel which might be selected include, but are

not necessarily limited to, persons trained in the following areas of expertise:

Acoustics	Communications	Meteorology
Air Quality	Economics	Sanitary Engineering
Archaeology	Geology	Sociology
Architecture	Highway Engineering	Structural Design
Biology	Hydrology	Transportation Planning
Botany	Landscape Architecture	Urban Planning
		Water Quality

2. **Qualifications**

In every case, interdisciplinary personnel are expected to perform professional services and must be prepared, by training and experience, to conduct indepth studies and prepare reports as required. Professionals have recognized skills in certain fields or areas of knowledge. Such skills are normally attained through education, experience, or both. Each member's work will be judged against standards established by his profession.

3. **Sources and Reimbursement of Professional Personnel**

- a. Disciplines available within the Department of Highways will be utilized to the greatest extent possible since one of the purposes of the interdisciplinary approach is to develop in-house expertise in various professions, thereby permitting all to work together effectively in solving transportation problems. However, personnel from other state or local agencies, private consulting firms, or professional personnel in the community may be included on teams as needed.
- b. Department of Highways personnel are reimbursed according to normal accounting methods. All costs incurred by such personnel in their conduct of necessary duties will be charged to the appropriate project. Consulting firms or individuals advertising as consultants will be selected and reimbursed according to the established procedures of D 27-50 (HE). Personnel from other agencies will be utilized through mutual agreement between the agencies and the Department. All such agreements will be negotiated by the appropriate Assistant Director or District Engineer as applicable. All costs incurred through the use of outside personnel will be charged under the terms of their individual agreements to the appropriate projects.

III. **PROCEDURES**

An interdisciplinary approach is utilized at each stage (i.e., corridor location and design) of project development. For projects with both a location and a design stage, the procedures following are repeated for each stage.

A. GUIDELINES FOR GROUP 1 PROJECTS:

1. For all Group 1 projects, the objectives of the systematic interdisciplinary approach are achieved by use of formally constituted Interdisciplinary Teams. These project Interdisciplinary Teams are utilized to achieve the following basic objectives; namely,
 - a. To conduct indepth studies of all pertinent factors and utilize the results in the delineation and evaluation of alternative solutions to transportation problems;
 - b. Develop and implement a community involvement program and utilize the findings in technical studies and the decisionmaking process;
 - c. Develop a Departmental recommendation concerning the specific courses of action to be taken.
2. The basic procedures for initiating, administering and operating such Teams are outlined below and begin when all Project Prospectus requirements are completed and location or design engineering funds are authorized.
 - a. Initiation of Interdisciplinary Project Studies.
 - (1) When the District is ready to proceed with development of a project, the Project Prospectus is reviewed and updated if required to reflect the current status of the projects. An updated Project Prospectus must be forwarded to the Assistant Director for Management Services for processing. An initiating document (the Project Prospectus and a memorandum indicating the project classification and the disciplines needed to plan and undertake the project studies and the proposed sources of such disciplines) will be forwarded to the appropriate Assistant Director for review and approval.
 - (2) The purpose of the review and approval of the initiating document by the appropriate Assistant Director is to indicate the decision of the District to undertake the project and to provide the management of the Department of Highways with a decisionmaking tool to determine if sufficient resources exist to pursue the project, if the project is consistent with current goals and objectives, and whether funds or other resources should be committed at that specific time.
 - (3) The initiating document will not include such detailed items as study procedures and the community involvement plan. These and other items are part of the Study Plan which will be prepared after the Interdisciplinary Team is appointed.

b. Review of Initiating Document

- (1) The District Engineer forwards the initiating document to the appropriate Assistant Director for review and comment. The appropriate Assistant Director is responsible for coordinating his review with other affected Assistant Directors. Approval of the initiating document shall constitute authorization for the District Engineer to proceed with project planning.
- (2) The appropriate Assistant Director, subsequent to the coordinated review, returns his comments to the District Engineer. All differences of opinion should be resolved between the affected parties prior to further implementation of the project.

c. Appointment of the Interdisciplinary Team

- (1) The Interdisciplinary Team members will be appointed by the District Engineer in accordance with the approved initiating document.
- (2) The District Project Engineer may be appointed a member of the Interdisciplinary Team if the District Engineer so desires, or another engineer may be appointed as the Team member with the Project Engineer working with the team providing necessary staff support.

d. Organization and Assignment of Duties of Interdisciplinary Team

- (1) Briefing of the Team by District Engineer

After the Interdisciplinary Team has been appointed, the District Engineer has the responsibility to outline the basic problem(s) to be studied, the scope of work to be undertaken, any known significant factors which affect consideration of the problem, and the time table for project development. Following the briefing by the District Engineer, the Interdisciplinary Team and the Project Engineer have the responsibility to develop a Study Plan which is then submitted to the District Engineer for approval before the Study is undertaken.

- (2) Organization of the Team

The Interdisciplinary Team will operate as a board with each member having equal status. The Team members will elect one of their members to serve as chairman.

(3) Resolution of Conflicts

- (a) If conflicts arise concerning Interdisciplinary Team procedures or related matters, the decisions reached by a majority of the Interdisciplinary Team will be binding on all Team members.
- (b) If other conflicts arise concerning operation of the Interdisciplinary Team which cannot be resolved by the Team as indicated above, appeal may be made to and decisions reached by the District Engineer.

e. Responsibilities and Duties of the Interdisciplinary Team

- (1) Develop a Study Plan including a community Involvement plan;
- (2) Review and assess transportation objectives in the study area pertinent to the problem being studied;
- (3) Conduct studies that are necessary for the development of the project. This will include various engineering, social, economic and environmental studies;
- (4) Implement the community involvement plan in cooperation with appropriate personnel from the District;
- (5) Evaluate alternative course of action;
- (6) Prepare reports, as necessary, including data and conclusions for the expertise involved including the views of the citizens, local officials and organized groups obtained through the community involvement plan.
- (7) Develop a Departmental recommendation concerning the specific course of action to be followed and prepare a report after studies have been concluded which contains the recommendations of the Team.

f. Duties and Responsibilities of Team Chairman and Project Engineer

- (1) The Team chairman has the responsibility to conduct meetings, coordinate Team efforts, and guide the Team so that the responsibilities and duties outlined in the Study Plan and the community involvement plan can be satisfactorily performed;
- (2) The Project Engineer who has the responsibility for the project will serve as administrative officer or executive secretary for the Interdisciplinary Team and, in this capacity, will expedite the project, provide staff assistance for members as required, undertake engineering studies

together with the appropriate Team member, coordinate and/or prepare reports, record assignments and decisions and review Interdisciplinary Team actions for conformity with existing policies and standards.

- (3) To achieve harmony and efficiency in the implementation of the Study Plan, the Interdisciplinary Team chairman and the Project Engineer will carefully coordinate their activities.

g. Development of the Study Plan Including the Community Involvement Plan.

One of the first duties of the Interdisciplinary Team is to develop a Study Plan in cooperation with the Project Engineer. The Study Plan is an extremely important document in project development since it outlines the scope of the work to be undertaken, procedures for accomplishing the work and assignment of the various tasks. Items to be included in the Study Plan are the following:

- (1) Purpose of the Study.
- (2) Work to be undertaken including types of data to be compiled and analyzed and reports to be prepared.
- (3) Delineation of areas of responsibility of each Team member.
- (4) Community Involvement Plan.
- (5) Work flow.
- (6) Methods by which technical studies and community values and desires will be integrated and presented for consideration in the decisionmaking process.
- (7) Manpower requirements.
- (8) Fiscal requirements.

h. Review and Approval of Study Plan

After the Interdisciplinary Team, with the assistance of the Project Engineer, has prepared the Study Plan including the community involvement plan, these documents will be reviewed and approved by the District Engineer and appropriate Assistant Director(s). This process will insure comprehensiveness of the Study, avoid duplication of effort and assure compliance with the time schedule and financial resources.

i. Determination of Evaluative Methods

The Interdisciplinary Team has the responsibility to adopt an evaluative approach prior to implementation of the Study Plan that will permit each member to determine the relative importance and desirability of the numerous factors involved in highway planning and design as related to the project under consideration. The basic purpose of the evaluative system is to determine factors to be studied, avoid duplication of effort in conducting studies, and determine an evaluative format which will permit the entire Interdisciplinary Team to integrate their efforts. To permit maximum understanding between the various people or groups with whom the Interdisciplinary Team will be working, the approach used by the Team should be as simple as possible while still requiring adequate consideration of all pertinent factors in reaching a Team decision. Each member will be required to conduct indepth studies in his own area of expertise, present his factual findings and recommendations to the entire Team and, likewise, review the work of other members prior to the time the Interdisciplinary Team makes a recommendation concerning the most appropriate course of action to take. A number of methods have been developed by Washington State University, California Department of Highways, University of Washington and others.

j. Implementation of the Study Plan Including the Community Involvement Plan

The District Engineer and Interdisciplinary Team will share responsibility for implementation of the Study Plan. Team members will have responsibility for determining data to be collected, analysis of data, and preparation of reports to the extent possible. The Project Engineer and his staff will provide assistance as needed and, by agreement, may assume responsibility for a function where it is more feasible for the District to perform work with the member acting as consultant overseeing the study in his area of expertise. The Interdisciplinary Team and/or District Engineer will assume responsibility for various types of community input as outlined in the community involvement plan. The member(s) responsible for developing the community involvement plan will be directly involved in its implementation.

k. Designation and Evaluation of Alternatives

After necessary data concerning the study area has been compiled and analyzed by the Interdisciplinary Team, the study and evaluation of specific alternatives can be undertaken. The designation of various alternatives for further study and evaluation will require discussion with the community as outlined in the community involvement plan to insure that the public is

cognizant of the problem, aware of various projections that have been made concerning future developments, and that an opportunity is provided for citizens to recommend specific courses of action for further study. The determination of alternatives for evaluation will be made mutually by the Interdisciplinary Team, District Engineer, and advisory committees wherever such committees are created. It is important that the Interdisciplinary Team and the District Engineer respond to suggestions from the public and consider alternatives suggested by the public. Each designated alternative will receive detailed study by the various disciplines to permit effective evaluation. Part of this study will include community values and desires.

1. Review Process

- (1) Since the Interdisciplinary Team and the public will be actively involved in the location and/or design of projects, it is important that those organizational units within the Department of Highways having responsibilities to review the alternative courses of action recommended by the Interdisciplinary Team, be actively involved in reviewing actions taken as the project develops.
- (2) A representative designated by the appropriate Assistant Director will review the progress of the study as it develops and determine whether project plans meet with standards and policies of federal or state governments. He will not serve as a member of the Interdisciplinary Team. This review is not intended to impair the freedom necessary for the Interdisciplinary Team to conduct a comprehensive and objective study and recommend the course of action to be undertaken, however, if deviations from standards and policies are contemplated by the Interdisciplinary Team, the representative will so inform the Team.
- (3) If such ongoing review does not transpire and conflicts in standards or policies are later discovered, the Department is placed in a position of reacting adversely to project recommendations developed after extensive study by the Interdisciplinary Team members and the public.

m. Preparation of Reports

- (1) Documents required for Group 1 projects include the Environmental Impact Statement, Report of Public Involvement Activities and Findings, and Recommendations of the Interdisciplinary Team. All of these reports may be combined into one document. However, the draft environmental impact statement must be completed prior to the time that the Team recommendations have been finalized or the community involvement program has been completed.

- (2) The responsibility for preparing the environmental impact statement will vary under differing conditions and hence the responsibility must be determined early in the location or design studies and the basic division of responsibility outlined in the study plan. Whenever possible, interdisciplinary team members should be assigned responsibility for preparing basic documents for inclusion in the environmental impact statement because of the team members expertise in their specific areas. Compilation and editing of the total document will be the responsibility of the Project Engineer and his staff.
- (3) The Report of Recommendations of the Interdisciplinary Team and the Report of Public Involvement Activities and Findings will be prepared by the Interdisciplinary Team.
- (4) After these reports have been prepared and approved by the Interdisciplinary Team they will be reviewed by the District Engineer and forwarded to the Director of Highways together with a memorandum outlining the District Engineer's proposed action on the project.

n. Public Presentations

The District Engineer and the Interdisciplinary Team share responsibility for public meetings and other areas of community involvement as outlined in the community involvement plan. Since the Interdisciplinary Team must carefully consider and evaluate the values and desires of the public as one important aspect of project development, they should obtain views of community through various means to insure that the views of the public at large are known.

o. Review and Response

After a Draft Environmental Impact Statement has been circulated and the responses received from other agencies and the public, the Interdisciplinary Team members responsible for the preparation of basic documents will have the responsibility to comment upon responses as required and necessary. Also, if other documents such as location or design reports are prepared by the Interdisciplinary Team, they should respond to comments to these reports as requested by the District Engineer

p. Recommendations of the Interdisciplinary Team

- (1) After the Interdisciplinary Team has conducted its own studies and evaluated and considered input from the community and other agencies (including comments on the Draft Environmental Statement and hearing transcripts), it will adopt a Departmental recommendation concerning the course of action to be followed. In the process of

adopting the course of action every effort should be made by the Interdisciplinary Team to achieve a consensus; but, if this cannot be done, the report will reflect the views of the majority. Those members who do not agree with the majority may include their views within the report, establishing conclusions and recommendations of all members. The report should be brief but indicate the basis for the recommendations. The Team Report of Recommendations is submitted to the District Engineer.

- (2) The District Engineer reviews and evaluates the team's adopted departmental recommendation and forwards it to the appropriate Assistant Director with a memorandum containing his proposed action on the project.
- (3) The Interdisciplinary Team will present information and/or recommendations as requested by the District Engineer at public meetings and before policy determining bodies.

B. PROCEDURES FOR GROUP 2 and 3 PROJECTS:

1. For Group 2 and 3 projects a formal Interdisciplinary Team need not be appointed, but an interdisciplinary approach is required. The District Engineer has the responsibility to determine the studies that will be undertaken and to appoint personnel having appropriate expertise to undertake studies and make recommendations. Although the formal team organization is not required for Group 2 projects, personnel involved in project development will meet as necessary to analyze the transportation problem and make recommendations. For Group 3 projects no team meetings are required, but should be held if the need arises.
2. The project development activities will be initiated by the preparation and approval of the initiating document in the same manner as Group 1 projects. The Study Plan will be prepared for Group 2 projects by the Project Engineer having responsibility for the project and then submitted to the District Engineer and the appropriate Assistant Director(s) for approval. A Study Plan is not required for Group 3 projects unless desired by the District Engineer.
3. The Study Plan (for Group 2 projects) will include the following items:
 - a. Brief description of transportation problems in study area.
 - b. Scope of work to be undertaken.
 - c. Proposed classification of project
 - d. Funds available for study
 - e. Disciplines needed in development of project.

- f. Sources from which interdisciplinary manpower will be obtained.
 - g. Community involvement plan.
 - h. Project development schedule.
4. The Project Engineer or other personnel appointed by the District Engineer will be responsible for the development of the project. Since a formally organized team is not required by the Action Plan for Group 2 or 3 projects, the project engineer has the responsibility to see that factual information and recommendations derived from professional studies and public involvement are considered in the decisionmaking process.
 5. The Project Engineer will have the responsibility for documentation of interdisciplinary involvement and analysis. Such documentation may consist of reports or memoranda or other written material placed in project files. Whatever form is utilized, it is important that reports or other documentation be maintained in such a manner that is readily available for review and reference.
 6. The Project Engineer has the responsibility to see that citizen opinions and recommendations are considered by decision makers for Group 2 and 3 projects. No formal community involvement plan is required for Group 3 projects, but the methods to be used to inform the public and obtain citizen opinions will be maintained by the Project Engineer to indicate how this has been accomplished.
 7. During the progress of the study it is necessary that the District Engineer or personnel appointed by him keep the management of the Department of Highways, local governmental officials, and the community abreast of the progress of the project and decisions reached.

**GUIDELINES FOR
TEAM SCHEDULING AND MANAGEMENT**

Prepared by

COMMUNITY DEVELOPMENT SERVICES, INC.

For

**WASHINGTON STATE HIGHWAY COMMISSION
DEPARTMENT OF HIGHWAYS**

In Cooperation with

**U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION**

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16. Abstract The purpose of this document is to present an effective method by which the scheduling and coordination of the activities of interdisciplinary teams can be carried out. A number of more traditional techniques of project control have not met the unique requirements of scheduling and managing the activities of an interdisciplinary team since the basic logic of task ordering is time sequentiality. Quite a number of the activities of an interdisciplinary team can be carried on simultaneously or at any given time within the projects' period. The system developed within this document uses the principle of "nested" descriptions of program activities and then proceeds to develop operational procedures. The role of the individual team members as well as the overall project development is described.					
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I. GENERAL DISCUSSION

The scheduling and coordination of the activities of the various members of a multi-discipline design team is a complex yet essential element of team management. Each team member must know where he fits into the overall process, not only in group dynamics of team meetings and joint team consideration of the problem, but also in the precise sense of knowing where his role interfaces with the roles of others, when his products will be used by others, and from whom in the team he will get the information he needs to effectively complete his work. Further, the design or research processes to be executed by each team member, whether done jointly with other team members or singly, should be visible to all other disciplines, for this enhances the quality of team participation and furthers the achievement of ultimate goals of the design team. Various disciplines do have differing traditions and work processes and often misunderstandings based on such different conventions lead to more difficult team operating problems. such as animosity, "defensive goal tending" (the assertion that the other member shouldn't interfere with oneself), and other divisive team behavior.

At the outset, "tried and true" techniques of complex project control such as Critical Path Method(CPM) and Program Evaluation Review Technique (PERT) immediately suggest themselves as methods of describing the various research and design processes and interlocking those descriptions to provide an overall coordinated analysis of specific team operations and individual team responsibilities.

Indeed, many teams have begun their multi-discipline design process by preparing a CPM of the problem before them. Few have finished under the same method of

program management, however. In fact, more likely than not, the systematic management of tasks and responsibilities through PERT or CPM will be abandoned soon after work is underway. The purpose of this document is to present a system which does lend itself to scheduling and managing an interdisciplinary effort. To better understand the reason for suggesting another system, it becomes necessary to understand the premises on which CPM or PERT are based.

The Critical Path Method rests on the logical ordering of tasks, wherein the basic logic of the task ordering is time sequentiality. That is, the CPM network links tasks by determining which tasks must be finished before a given task can be started. Usually, when a CPM project analysis is prepared, all tasks are listed, and then each task on the list is examined and a judgment made with regard to which other tasks on the list are required to be finished before the task under consideration can be started. When this is done, all of these assessments are assembled into a network reflecting the sequentiality implied by this logical basis. Once the network is constructed, the time from beginning to completion of each task is assessed and these time factors added to the network description to determine the time implications of the network logic. From this time-dimensioned logic the critical path (that sequence of tasks that must be completed on schedule for the entire project to be on schedule) and key milestones or bench marks can be discovered, and a project schedule delineated.

PERT differs from CPM primarily in that the significant entity is an event, rather than a task, and time is treated more realistically. The distinction between event and task in PERT or CPM, respectively, is more semantic than real. Events essentially are certain marking points in the logical sequence of tasks which are of importance to project progress. However, the sequentiality

of tasks is based on the same "finish these before starting those" logic. A PERT network looks very similar to a CPM network, except different parts of it are given different emphasis. The more realistic treatment of time in PERT is due to the time estimates of tasks being stated in stochastic (or probabilistic) terms, thus reflecting the uncertainty around any estimate of time to complete a task.

Both CPM and PERT were designed for use in construction projects, originally in weapons systems implementation for the Department of Defense, and are now widely used in large scale construction and complex manufacturing activities. In these fields, the "finish this then start that" logic portrays the operational procedures normally followed to achieve some objective. In the management of complex interdisciplinary design teams, where the activities of many players must be coordinated, it is natural to try and apply CPM or PERT to the design team process.

However, it doesn't work. And it doesn't work for at least two reasons. First, the logic of the design process does not have the same sequentiality as that of the processes normally subject to CPM or PERT analysis. Second, CPM or PERT is both too complex, for it requires significant initial analysis at the outset which is difficult to modify, and too simple, for there is insufficient detail to allow for the proper coordination of the many team members' activities.

The primary distinction in the logic of design or research processes is that, whereas the ending of a given task is clearly discernible, its beginning is not so obvious. Indeed, of the many tasks before the design team at the outset of the project at hand, virtually all of them could be started on the first day of

the project. For example, many teams begin at least the format portion of their final reports at the very early stages of a project. Of course, it cannot be completed before the project's technical work and reviews are done, but it can be started almost anytime. Similarly the definition and consideration of alternative solutions to the problem at hand often starts, at least in the minds of the team members, at the end of the very first team meeting.

The important logical distinction, then, between design team processes and those which traditionally use PERT or CPM is that tasks in the design process have "fuzzy" beginnings. There are rarely well defined starting points for the various activities. Therefore it is difficult, if not impossible, to delineate what should be completed before a given task starts, since most tasks can, and do, start before anything is necessarily finished. This inherent logic of the design process means that any attempt to describe it in terms of PERT or CPM must distort the actual workings of the process. Such distortion is immediately realized by the team members, which, in turn, leads them to either mechanically force their work into the required mold, or largely ignore the procedural implications of the project management network, thus voiding its primary validity. Neither activity, of course, is conducive to overall team operations.

The second difficulty arises out of the cumbersomeness of PERT or CPM when modification is necessary and when sufficient detail must be illustrated in the network descriptions. There has never been a case in this author's experience where, after an initial project logic description and schedule calendar had been specified, that some unforeseen problem or external change in conditions did not force the initial description to be out of date. Such situations where this does not occur must be rare. Thus any project definition established at the outset of a program (in Step 1) must be done in such a manner as to permit its modification, if and when necessary.

If the project descriptive tool is CPM or PERT, then this expected need to modify forces one of two things to happen. First, the initial project description can be done on a general level. This means that fewer tasks would be described. Therefore, there would be fewer tasks to modify, and the network would be less sensitive to program changes. However, such levels of generality are costly in terms of precision of work flow descriptions and eventually in delineation of responsibility. This latter point can be quite important if the project is large and controversial. One of the most severe attacks on the operation of a multi-discipline design team is that of a community group who asserts that the design team is fuzzy in its responsibilities. Furthermore, when the project is controversial and large, to describe the work program in detail sufficient to clearly identify responsibility requires an extensive PERT or CPM network.

If this is the case, then the second problem alluded to above happens. This is that changes in the project description need to be reflected in modification to a large network, which can be a very large administrative and bookkeeping task. In the construction industry, for example, where PERT is used and the networks are quite complex, computers are used to manage the network.

However, in all but the very largest highway team problems, the added expense of computers and their supporting staff cannot be justified. But without such a bookkeeping capability, modification to a complex network just cannot be done. In fact, it often takes longer to modify the network than it does to execute the various tasks described in it.

Of these two options, the one most often elected is the first, but the one needed for effective project display is the second.

In response to these difficulties with traditional methods of project scheduling and control, a system has been designed specifically for the types of problems undertaken by multi-discipline teams. It is called Team Program Logic, or TPL. The objectives of TPL are these:

- 1) Provide for a description of a project of sufficient detail to define precisely the responsibility of each team member, on the one hand, and the responsible team member for each project task, on the other.
- 2) Provide for ready modification under the inevitable changes that will occur, and yet maintain its level of detail.
- 3) Provide the capability of easy communication of the program to the community and other interested parties.
- 4) Recognize the inherent logic of a design process, i.e. that tasks can begin at any time, but must end in some sequential order.
- 5) Provide for the precise description of inputs and outputs of each task, so that the basis for a sequential relationship between project tasks can be seen.

To achieve these objectives, TPL uses the principle of "nested" descriptions of program activities. It is recognized that a general level of project description is needed for comprehension by all team members and outsiders. A block diagram is usually prepared relating these general level tasks to each other according to the logical premise that a first precedent to a given task must be completed before the given task can be completed. This block diagram is called a level one logic diagram. Figure 1 illustrates the general multi-discipline design team work tasks as a level one logic diagram.

Level one logic is of no use in illustrating the processes of execution of each general task, however, and is hence of no use in making that visible to all team members. Therefore, in TPL each level one task is broken down into

a second level of detail, wherein the operational aspects of each gross task is explained.

Essentially, a block diagram of each level one task is prepared, showing how it would be executed. Furthermore, it is developed as though that particular task were the only one under consideration, i.e., in a self-contained manner. (Once two or three sequential tasks at level one are described at level two, the level two tasks can be appropriately interrelated.)

Often, however, even at the operational detail of level two, the responsibility for some tasks will not be clear. That is, there will still be level two tasks that have more than one team member involved in their execution. This is an undesirable situation from a team management standpoint, for shared-responsibility tasks are difficult to maintain management control over. In such cases, it might be necessary to develop some level two tasks at even greater detail, in order to isolate responsibility. As was the case with the transition from level one to level two, the transition from level two to level three is done by considering a single level two task and describing its operation in detail by itself, connecting it to other level three task descriptions if necessary only after the breakdown is completed.

It is rare, but possible, that even a level three description will not isolate responsibility. If this is the case, then level four or more descriptions of selected tasks can be developed. This usually occurs, however, only in the most complex multi-discipline team projects.

Figure one shows the relationships between the various levels of program logic description.

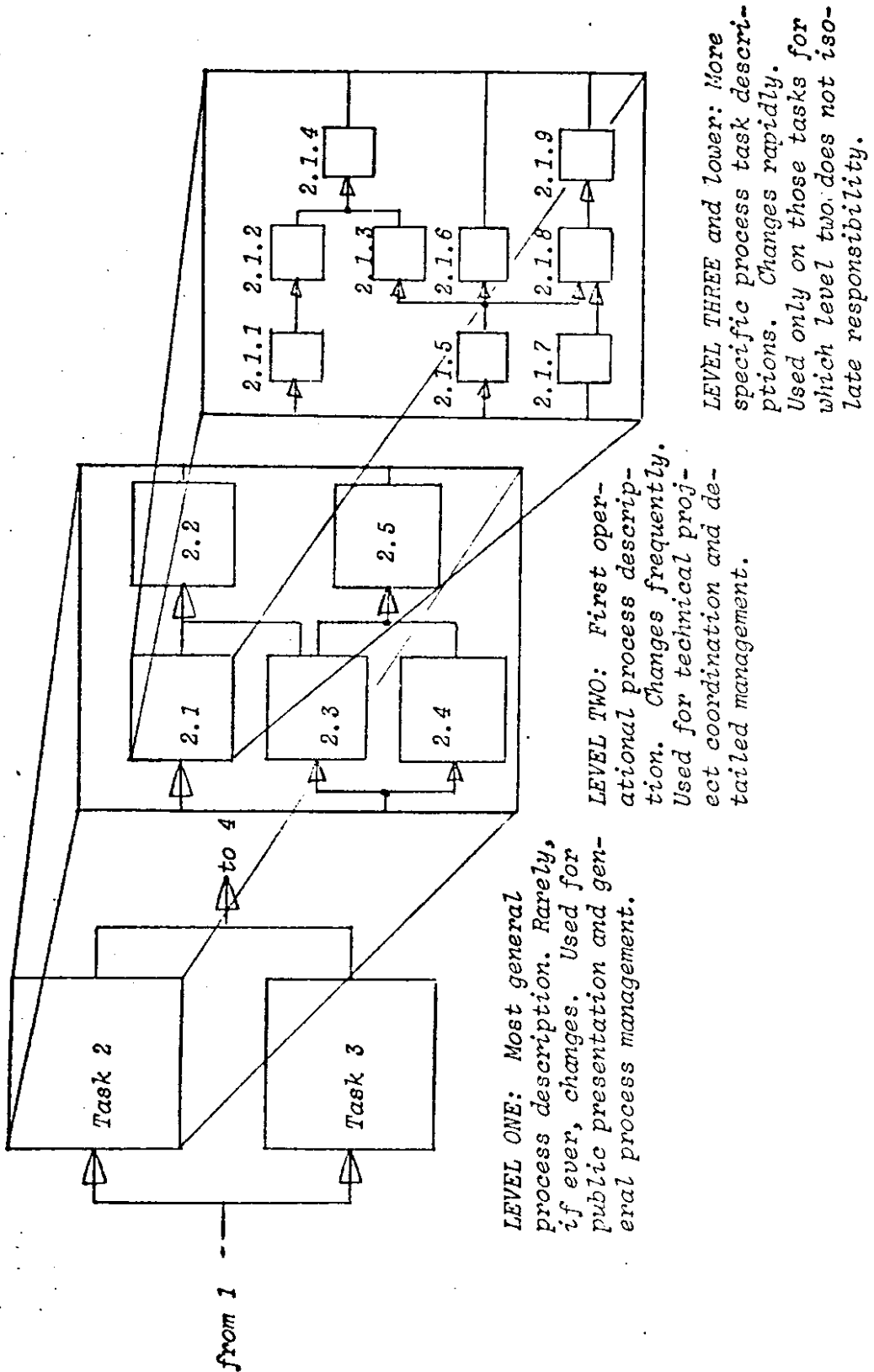


FIGURE ONE: NESTING PRINCIPLE OF TEAM PROGRAM LOGIC (TPL)

In the use of TPL a level one diagram is always prepared, and, subject to time nesting discussed below, so is a level two. Level one can be used for general presentation to the public and as a general guide to overall team operations. Level two and lower are operational descriptions of the process which are developed for managerial purposes. Notice that, however, levels three and lower are not necessarily assembled for every level two task, but only for those tasks where responsibility is not clear. This illustrates a fundamental characteristic of TPL: One does not describe the program in any more detail than is necessary for effective management.

This selective breaking-down, or nesting, of task descriptions allows another dimension to the use of TPL. This is nesting in terms of time.

At the outset of a project, with at least some changes expected, it is not necessary to carry every level one task to level two or lower. Only those in near proximity to the present need be so described. What constitutes proximity depends on the project. However, by way of example, a year-long design project would have level one developed for the entire year, level two developed for the next four months, and necessary levels three or four for the next two months. This type of nesting with relation to time prevents excessive detailing early in the project, and permits much more ready modification of the project description. Figure two illustrates this time-dependent logic description.

Of course, in order to have time-nested logic descriptions, one must have time data included in the TPL documentation. This is not included in the logic diagrams because of the need to keep the process logic clear, but is defined in a piece of documentation called a project calendar. Looking somewhat like a classical Gantt chart, it shows the calendar time to be spent on each task.

For each level of logic a calendar should be prepared. It follows, then, that the calendars are also nested, both in logic level and in time. Again, this nesting provides flexibility in terms of possible schedule modification. Figure three illustrates a hypothetical calendar for a level one logic diagram.

A third set of documentation is usually prepared with a TPL description of a project. It is called the product specifications, or PS. A PS is written for each task at its finest level of detail, i.e., at that level of description for which there is a uniquely responsible team member. A PS is merely a sheet which identifies

- 1) What is to be the product(s) of the task
- 2) When are they due
- 3) What outputs from other tasks are needed for the completion of these outputs
- 4) What outputs from other tasks need this output for their completion.

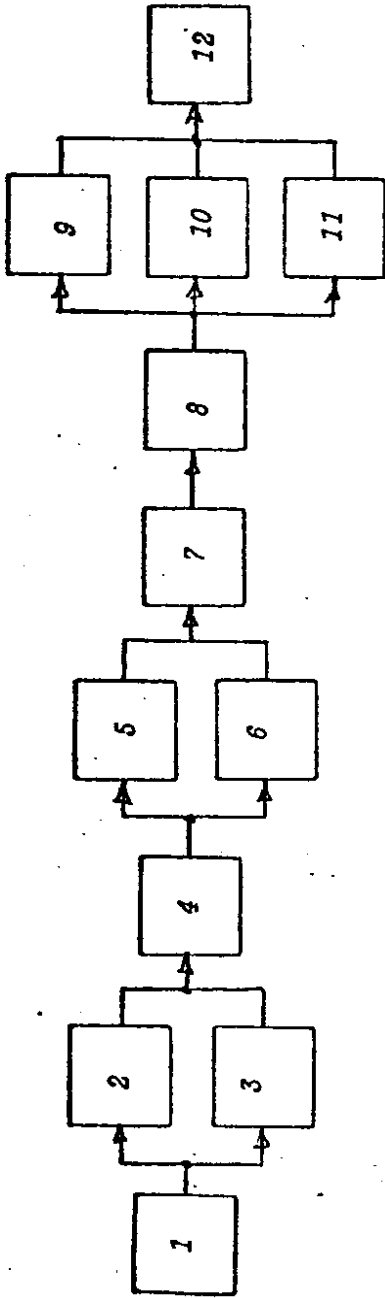
Figure 4 shows a sample PS. The purpose of the PS is, of course, to delineate the exact relationship between tasks, and thus the substantive basis for their interrelationship. Of course, PS's are not prepared until the lowest level of detail is defined. This means, then, that they are prepared only for near term products that have been identified in near-proximate time; i.e., they are subject to time nesting.

Thus TPL includes three pieces of documentation, as shown in figure 3. These are:

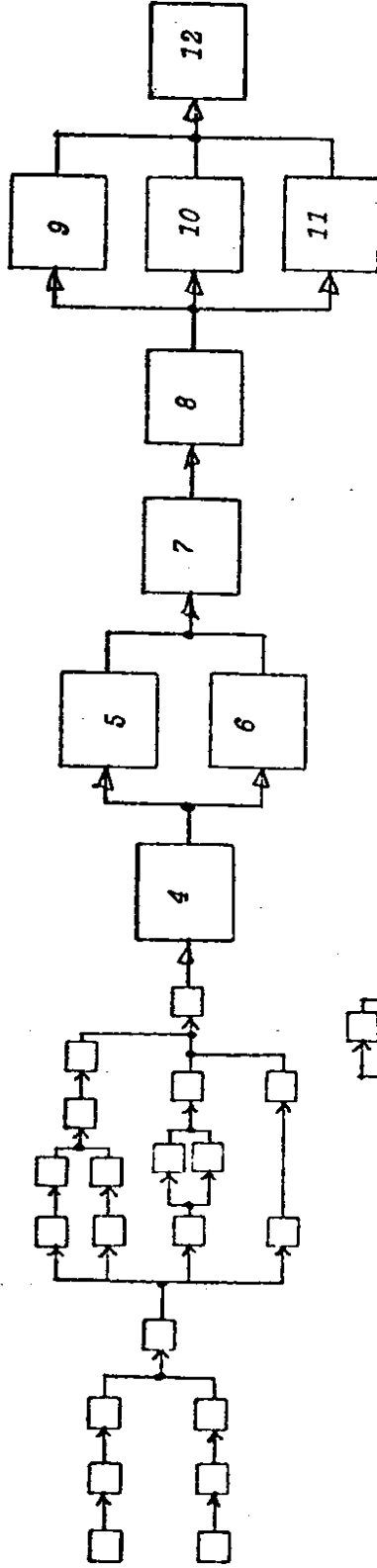
- 1) The logic diagrams, showing the logical interrelationships of tasks at various levels of detail, subject to "end this then end that" logic.

FIGURE TWO: TIME NESTING

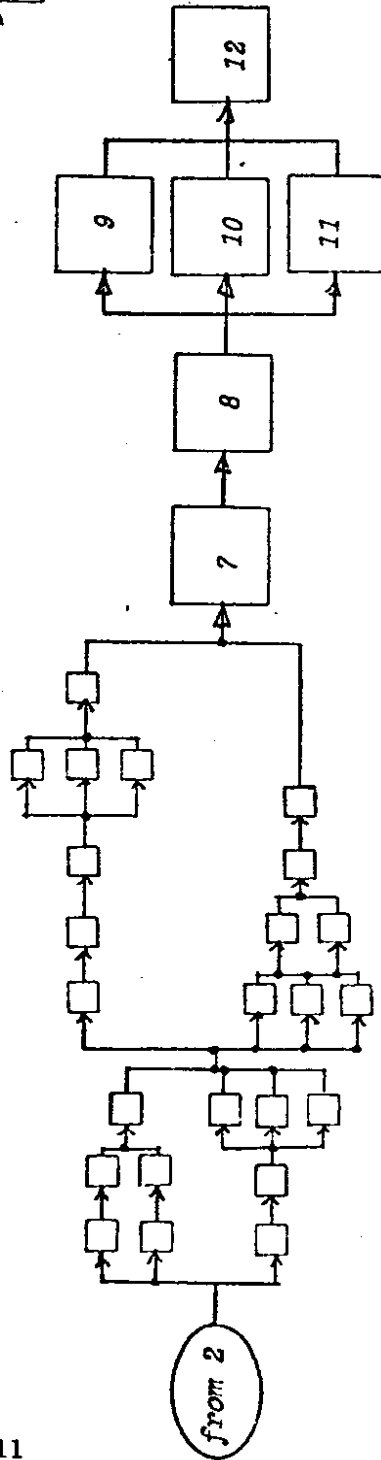
Level one description of entire process.



Time period one: Tasks 1, 2, 3 broken down to more detail.



Time period 2: Tasks 1, 2, 3 completed. Tasks 4, 5, 6 broken down to more detail.



Time period 3: Tasks 4, 5, 6 completed. Tasks 7, 8, 9, 10, 11 and 12 broken down to greater detail.

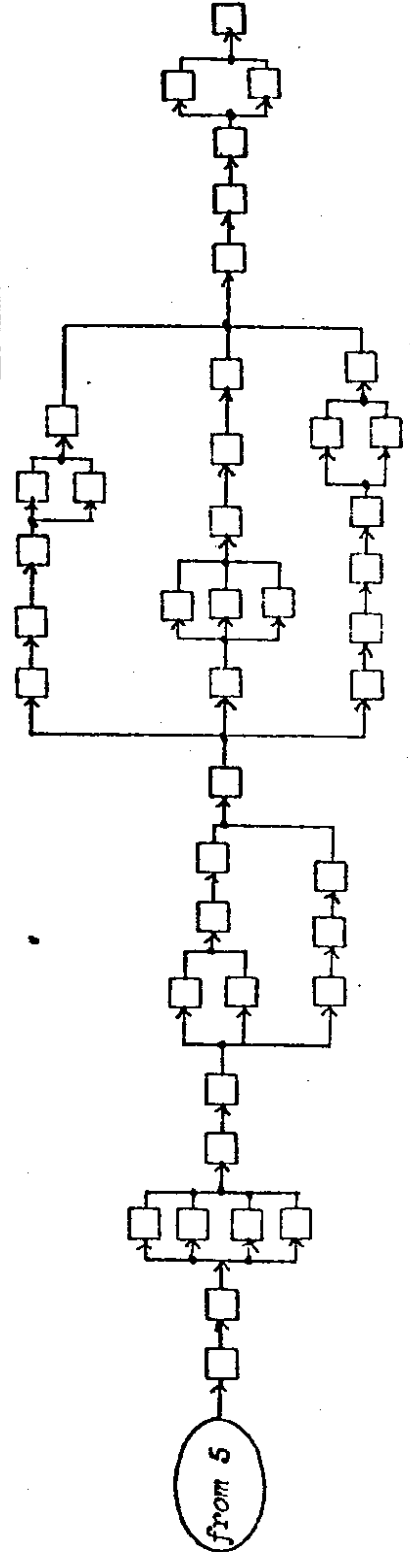
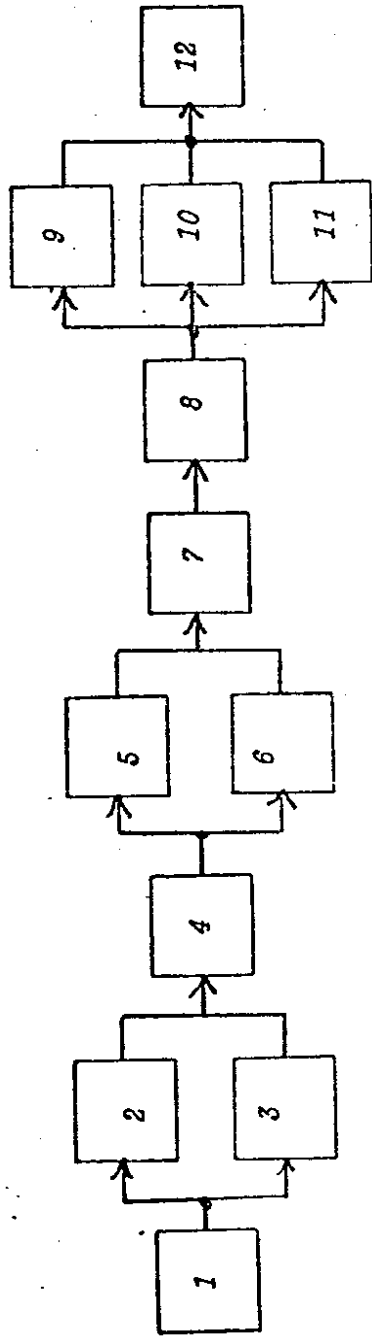
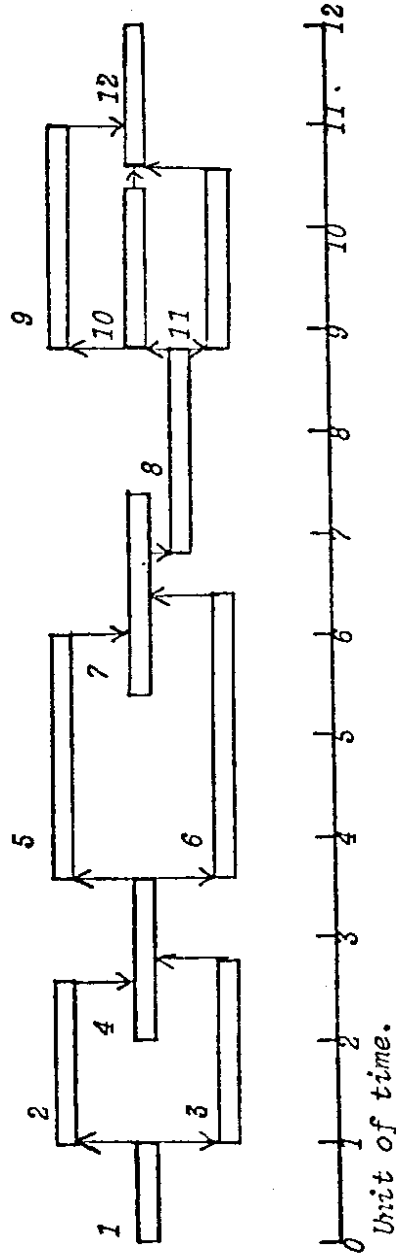


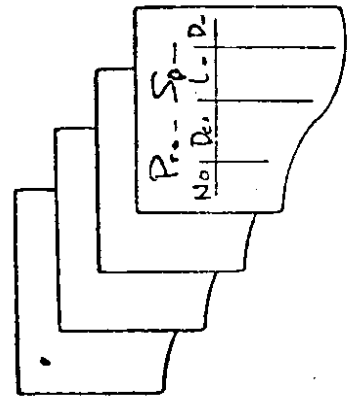
FIGURE THREE: DOCUMENTATION REQUIRED FOR TEAM PROGRAM LOGIC



Logic Diagrams: Describe the relationships between tasks, at whatever level of detail required.



Calendars: Describe task timing and schedules. Useful for manpower allocation and budget preparation and control.



Product Specifications: Defines actual products resulting from each task, including their responsibility, expected date of publication, and the logical connections between this and other steps.

FIGURE FOUR: SAMPLE PRODUCT SPECIFICATION

HIGHWAY DESIGN TEAM

PSP 27

PRODUCT SPECIFICATION

TASK 2.3 RESPONSIBILITY Urban Planner PAGE 1 OF 1

NO.	DESCRIPTION	LOGIC		DUE DATE
		IN	OUT	
2.3.1	Map of general zoning throughout region	2.1	2.8	June 30
2.3.2	Detailed zoning maps of areas in immediate vicinity of facility sites	2.1	2.8	July 15

SAMPLE

- 2) Calendars, showing the time of execution of each task.
- 3) Product specifications, showing the precise products and responsibilities for each task, and prepared for the lowest level of detail of each task description.

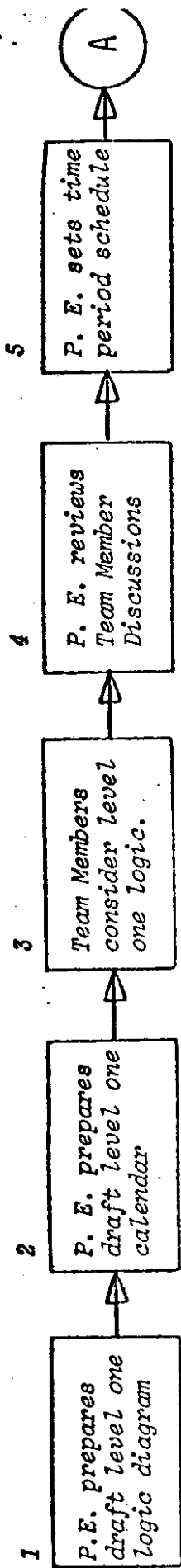
It is possible, with little difficulty, to use the TPL description of a program as a basis for allocation of budget and cost control. The only requirement is the preparation of supplementary documentation describing cost allocations to task and to time.

II. OPERATIONAL PROCEDURE

The primary responsibility for preparation of the TPL description of the program rests with the project engineer. However, he should, and must, enlist the services of the other team members for a proficient execution of team management. The general flow of the work of program documentation preparation is shown in Figure 5. Each step in this process is described below. However, the unique character of each individual project should be considered in following this procedure, and appropriate variations made from it when the situation demands it.

The sixteen procedural steps recommended for preparation of TPL documentation will be discussed in detail.

1. Development of Level One Logic Diagram By Project Engineer (PE). The first task is the development of the general task description and logic flow of the level one diagram by the P.E. In Figure 6 a general level one as stipulated in other State Highway Department Guidelines is presented. This can be used as a guide, either to be adopted as is, or modified to suit the unique characteristics of the situation at hand.



TASKS ABOVE ARE REPEATED ONLY IF LEVEL ONE LOGIC CHANGES

TASKS BELOW ARE REPEATED EVERY UPDATE PERIOD

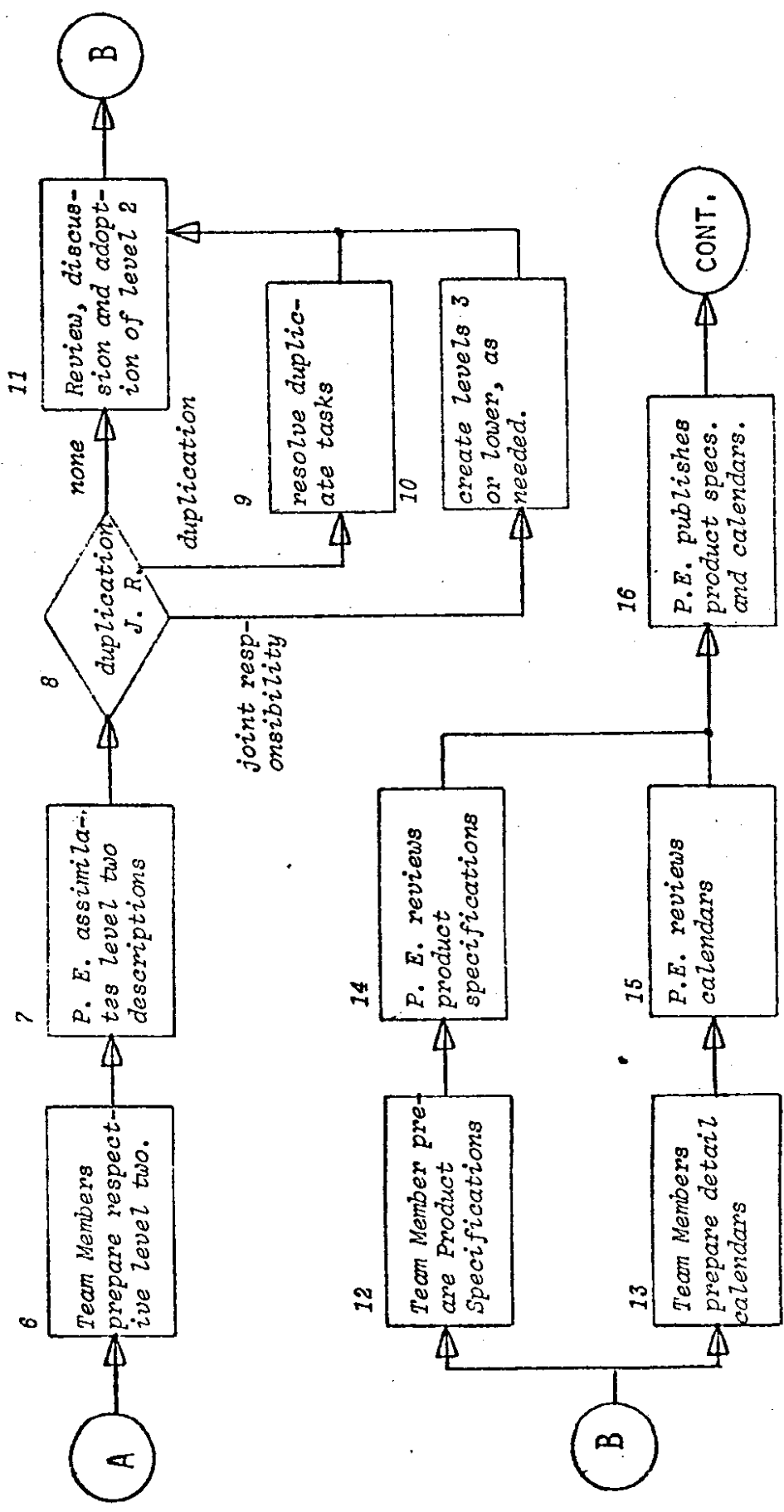


FIGURE FIVE: SUGGESTED PROCEDURE FOR TPL DOCUMENTATION PREPARATION

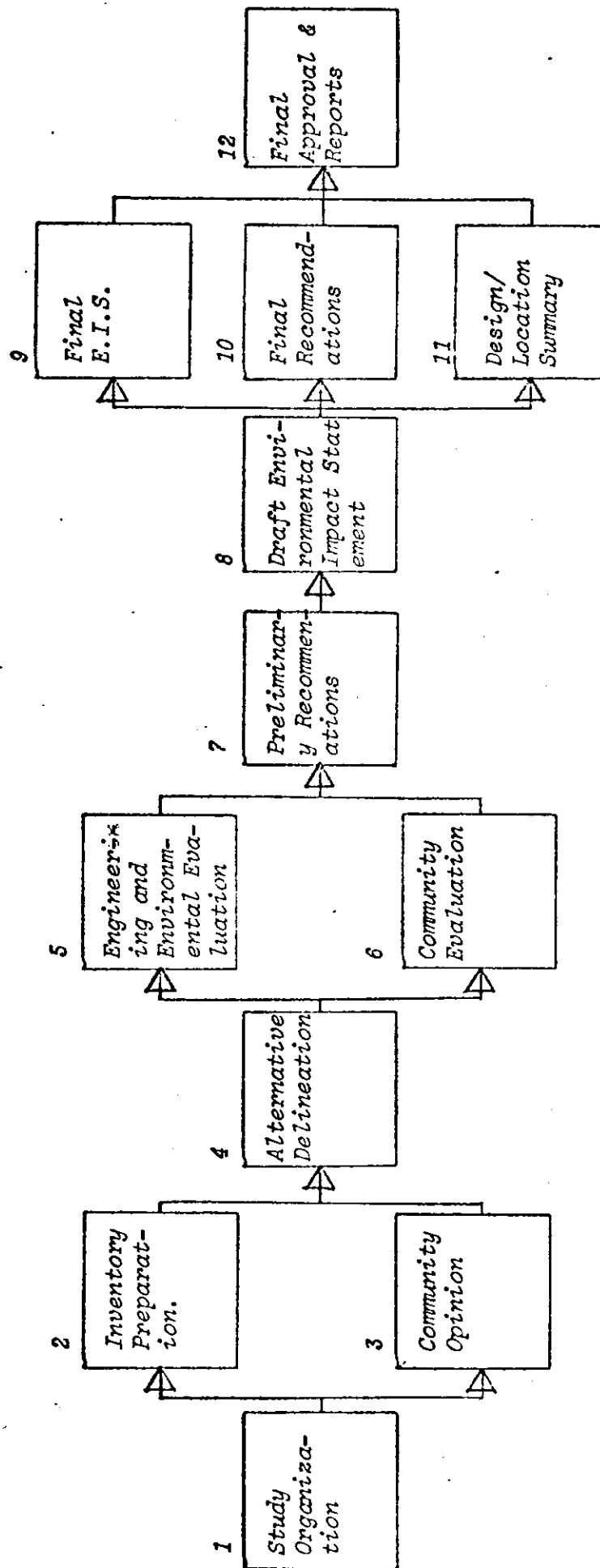


FIGURE SIX: DESIGN TEAM GENERAL PROCESS; LEVEL ONE LOGIC DIAGRAM

2. Development of a Level One Project Calendar by the P.E. The Project Engineer should also assemble a level one project calendar at this point. This will set the general framework for estimation of time in future steps in the documentation procedure. However, the time estimates here should be considered, insofar as external circumstances (imposed deadlines, etc.) permit, tentative, and subject to modification as a result of further tasks.

3. Team Member Consideration Level One. At this point, each team member should take the level one logic diagram and describe his role, in general terms, in each level one task. To facilitate this, the forms illustrated in Form 1 may be used. The purpose of this activity is to guarantee that all team members are thoroughly familiar with level one, and as a necessary prelude to Step 6, preparation of level two logic descriptions.

4. Review of Team Member Considerations by P.E. The results of Step 3 are here reviewed by the P.E. This should give him a clear indication of the general areas of responsibility for each team member, and allow him to judge the efficiency of the level one logic description in light of the operations of other team members. This may necessitate revision of the level one diagram to some degree, and this should be done at this time.

5. Establishment of Time Period for Level Two and Lower Logic Descriptions. At this step of the procedure, the P.E. determines the best time period for detailed logic diagram preparation. In coming to this decision, the P.E. should take into account, the complexity of the project, the likelihood and rapidity of external change, and the overall project length. As a general guideline, time periods for level two and lower logic should not be less than two months, nor longer than six. Whenever possible, time period scheduling should coincide with the ending schedule of level one tasks. This simplifies the updating process.

Form No. 1: TEAM MEMBER DISCUSSION OF GENERAL PROJECT LOGIC.

TEAM MEMBER: _____ | GENERAL AREA OF RESPONSIBILITY
PREPARED BY _____ DATE _____ | _____
PAGE _____ OF _____ | _____
RETURN TO PROJECT ENGINEER BY _____.

For each of the twelve tasks below, please describe the general nature of your work in that task. Refer to the level one logic diagram for the general name and content of each task.

TASK 1:

TASK 2:

TASK 3:

TASK 4:

TASK 5:

TASK 6:

TASK 7:

TASK 8:

TASK 9:

TASK 10:

TASK 11:

TASK 12:

SUGGESTED MODIFICATIONS.

Below please indicate any suggested modifications (additional tasks, task redefinitions, etc.) to the above twelve. Be especially aware of instances where the level one logic does not suit well the operation of your responsibility.

Also at this step, the P.E. delineates when the level two and lower logic descriptions shall be done for succeeding time periods. This should be started no later than one month before the end of any time period. Note that this is not necessary for all time periods to be of the same length.

As an aid to this step, a simple form such as that of Form 2 can be used.

6. Team Members Prepare First Period Level Two Descriptions. In this task, each team member takes the level one tasks that need refining in the first period and prepares a level two description of his role in that task. He should also describe expected interrelationships with other team members. Only the tasks which fall in the first time period need to be discussed. Forms like that shown on Form 3 may, if desired, be used to ease this process. It may well be necessary, and is certainly desirable, for team members to communicate with one another during this step.

7. Project Engineer Assimilates Team Members' Level Two Descriptions and Prepares Overall Level Two. Here the P.E. takes the output from Step 6 and prepares a level two description of the tasks in the first time period. He should note if any tasks appear in more than one team member's descriptions (duplication), or if any tasks are going to have joint responsibility between two or more team members.

8. Duplication or Joint Responsibility Branch Point. If there is duplication resulting from Step 7, then the procedure moves to Step 9. If there is joint responsibility, it moves to Step 10. If neither is the case, the procedure moves to Step 11.

Form No. 2: PROJECT LOGIC UPDATE SCHEDULE

DATE _____ REVISION No. _____ SUPERSEDES SCHEDULE OF _____

PREPARED BY _____ APPROVED BY _____

TIME PERIOD 1: Update to be completed by _____ (This is the initial break-down of tasks in the project.)
Tasks expected to be broken down to level two or lower:

TIME PERIOD 2: Update to be completed by _____
Tasks expected to be broken down to level two or lower:

TIME PERIOD 3: Update to be completed by _____
Tasks expected to be broken down to level two or lower:

TIME PERIOD 4: Update to be completed by _____
Tasks expected to be broken down to level two or lower:

TIME PERIOD 5: Update to be completed by _____
Tasks expected to be broken down to level two or lower:

TIME PERIOD 6: Update to be completed by _____
Tasks expected to be broken down to level two or lower:

TEAM MEMBER _____

PAGE ____ OF ____

PREPARED BY _____

DATE _____

PART ONE: Below please list all level two tasks, a short name for each, and a reference number for comparison to Part Two. Use additional pages if necessary and number them above, as shown.

LEVEL ONE	DESCRIPTION	SHORT NAME	REF No.
TASK No.			

Form No. 3, Continued.

PART TWO: *Please sketch below the logical relationships between each of the tasks described in part one. Be sure to use the appropriate reference numbers, prefixed with the level one task number. For example, the second task at level two under task 1 at level one should be number 1.2, the third task 1.3, etc.*

9. Resolution of Duplications. In the case of duplication, the P.E. sits down with the affected parties and clarifies the duplication. Any duplication is either an actual duplication of work, in which case the P.E. must decide who shall be responsible for the task, or it is an apparent duplication because of similar task descriptions. If this is the case, then the tasks should be rephrased to clarify the distinction between them.
10. Development of Level Three Logics. In the case of a level two task having joint responsibility between two or more team members, the P.E. requests at this step a level three description of the joint task. Each affected team member develops his respective elements of this description. If, after the assembly of a level three description, there are still joint responsibilities evident, he may have the team members go to level four. Form 4 is suggested for this activity.
11. Review Discussion and Adoption by Team. At this step, the completed level two, and any supplementary levels three or four (or lower) logic descriptions are reviewed by the team, discussed, and after making any necessary modifications, adopted by the team.
12. Preparation of Product Specification by Team Members. At this step, each team member specifies which products he will produce from each of his level two (or lower) tasks. Form 5 is suggested as a format for this. The product specification should be succinct, but clear, and should only consider products that will actually be produced as documents or other artifacts. Discussions, hearings, etc. which, in and of themselves are not products, need not be specified. (However, documents such as minutes, which result from hearings or meetings might qualify.) Also, interim products that are

Form No. 4: . LEVEL THREE OR LOWER LOGIC DESCRIPTION

TEAM MEMBER _____
PREPARED BY _____

PAGE _____ OF _____
DATE _____

PART ONE: *Below please list all sub-tasks, a short name for each, and a reference number for comparison to Part Two. Use additional pages if necessary, numbering them above in the spaces provided.*

HIGHER LEVEL TASK No.	DESCRIPTION	SHORT NAME	REF No.

PART TWO: Please sketch below the logical relationships between each of the tasks described in part one. Be sure to use appropriate reference numbers, prefixed with the higher level task number.

produced prior to the completion of a task need not be specified.

The due date portion of the product specification can be fitted in when it has been determined from Step 13.

13. Preparation of Detailed Project Calendars by Team Members. Simultaneously with the stipulation of product specifications are the determination of detailed calendars. These should be done at level two and all lower levels where they exist. Form 6 is a suggested format for this information. The data from this activity can be transferred to the Product Specifications upon completion.

14. Project Engineer Review of Calendars. At this point, the Project Engineer reviews the calendars and prepares a combined calendar. Simultaneously, he is conducting Step 15. As he reviews and prepares the calendars, he should note any conflicts between calendar dates and externally imposed deadlines, including the level one calendar, and assesses if the logic of the logic diagrams are being violated. (This means that the calendars should reflect the proper sequence of tasks.) If there is any difficulty with the calendars, he should see that they are rectified via discussions with the appropriate team members.

15. Project Engineer's Review of Product Specification. The P.E. also reviews, at this point, the product specifications submitted by the team members. He should check for clarity and consistency with the logic descriptions, clarifying any problems with affected team members.

16. Publication of Detailed Calendars and Product Specifications. The accumulated product specifications and final detailed calendar are now published for

Form No. 6: DETAILED CALENDAR

UPDATE PERIOD _____

TEAM MEMBER _____

PREPARED BY _____

PAGE _____ OF _____

DATE _____

TASK NUMBER

COMPLETION DATE

TASK NUMBER

COMPLETION DATE

all team members. The calendar can be in the form of a chart, while the product specifications are best put in a loose leaf notebook.

At each update period (as specified in the update schedule resulting from Step 5) Steps 6 through 16 are repeated. It is at this point where altered external circumstances, internal shifts in time or process, and newly discovered technical aspects of the job at hand are introduced into the management process.

If significant changes in the project have occurred, it may be necessary to modify the level one logic or calendar. The modification of the calendar has no effect on the documentation update. However, a change in level one logic will necessitate beginning the updating process at Step 1 rather than Step 5.

Lest it seems to the reader that this procedure is cumbersome, let it be noted that the entire process takes only a few days for most projects. In Figure 7 a suggested calendar for the process of Figure 6 is illustrated. Note that the entire sequence takes only ten calendar days, and the updating process only six days.

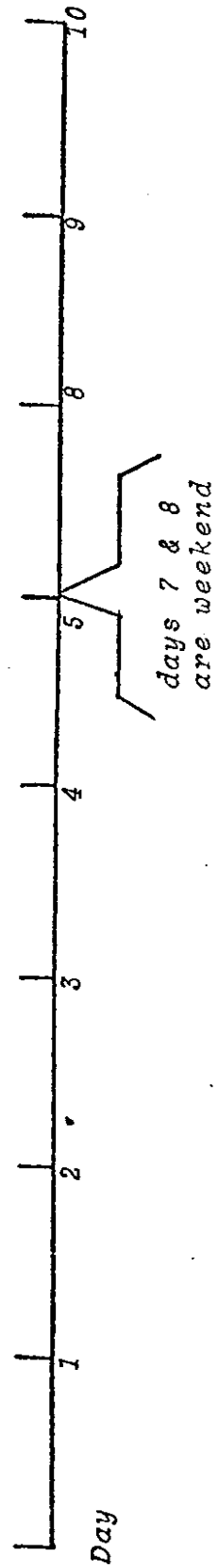
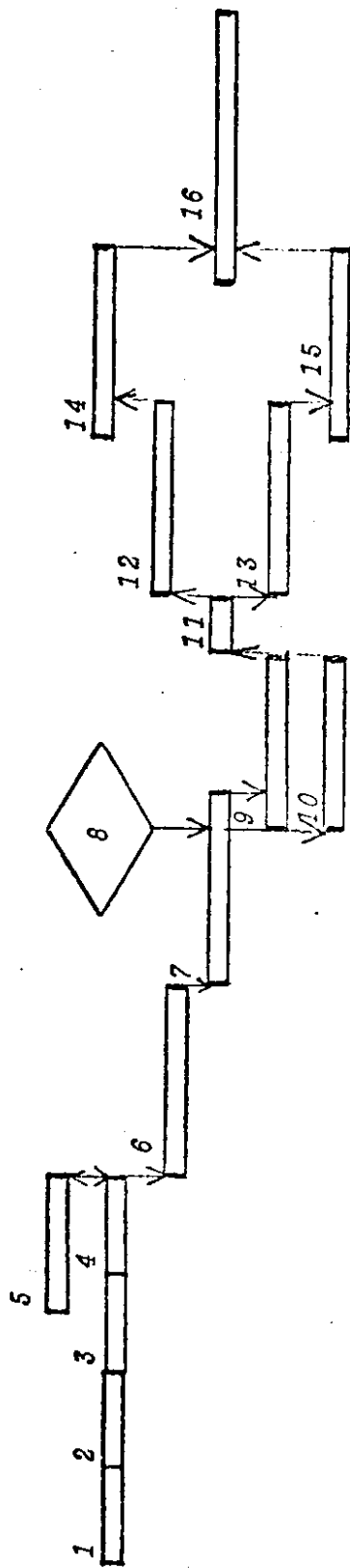


FIGURE SEVEN: POSSIBLE CALENDAR FOR TPL DOCUMENTATION PREPARATION PROCEDURE