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REPORT

25.2

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

RESEARCH PROJECT

HR-527

SEPTEMBER 1975

PREPARED FOR
WASHINGTON STATE HIGHWAY COMMISSION
IN COOPERATION WITH
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SOCIAL AND ECONOMIC PLANNING SECTION
PLANNING, RESEARCH AND STATE AID
DEPARTMENT OF HIGHWAYS

1. Report No. DOH 25.2		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle GUIDELINES FOR THE IDENTIFICATION AND MEASUREMENT OF SOCIAL FACTORS IN TRANSPORTATION PLANNING				5. Report Date September, 1975	
				6. Performing Organization Code	
7. Author(s) Social and Economic Planning Section, 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	
				14. Sponsoring Agency Code	
15. Supplementary Notes					
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 inventorying 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>					
17. Key Words Measurement of Social Impact, Social Factors, Community Identity, Community Values and Desires, Community Cohesion, Disruption, Displacement, Relocation, Minority Interests				18. Distribution Statement	
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 26	22. Price

**GUIDELINES FOR THE
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SOCIAL FACTORS IN TRANSPORTATION PLANNING**

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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.

ACKNOWLEDGEMENTS

These guidelines were prepared by the Social and Economic Planning Section of the Washington State Department of Highways. The authors gratefully acknowledge the assistance of Mr. Robert Jacobson of Community Development Services in the preparation of these guidelines.

The purpose of this document is to provide assistance in identifying and evaluating the social impact of transportation systems. Social impact has meant different things to different individuals, and this report seeks to provide the basic approach to the problem by identifying and defining the variables that are considered in the analysis of social impact.

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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

- | | |
|---|---|
| <ul style="list-style-type: none"> 1. Acoustics 2. Air Quality 3. Water Quality 4. Wildlife 5. Vegetation 6. Geology 7. Soils 8. Drainage 9. Governmental Services <ul style="list-style-type: none"> a. Health b. Education c. Utilities d. Police & Fire 10. Other Public Institutions 11. Transportation Service to Areas <ul style="list-style-type: none"> a. Regional b. Local c. Route Continuity 12. Traffic <ul style="list-style-type: none"> a. Regional b. Local Circulation 13. Design Factors and Standards <ul style="list-style-type: none"> a. Project Traffic b. Right of Way c. Capacity d. Geometrics e. Restraints 14. Aesthetics 15. Construction Costs 16. Maintenance Costs | <ul style="list-style-type: none"> 17. User Costs <ul style="list-style-type: none"> a. Vehicle Operation b. Safety c. Time d. Comfort-Convenience 18. Economic Activity <ul style="list-style-type: none"> a. Tax Impact b. Employment c. Trade d. Property Values 19. Land Use Impact <ul style="list-style-type: none"> a. Existing & Projected 20. Comprehensive Planning Process 21. Urban Form & Development 22. Community Identity <ul style="list-style-type: none"> a. Population Trends b. Characteristics c. Neighborhood Characteristics 23. Displacement 24. Relocation 25. Disruption 26. Community Cohesion 27. Minority Interests 28. Community Values & Desires <ul style="list-style-type: none"> a. Area Development b. Transportation Values & Desires c. Perception of Problem d. Solution of Problem |
|---|---|

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 germane" 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

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

Community Factors*	Displacement	Relocation	Disruption	Community Factors*
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	Residential units by type occupancy, age & condition	Families by demographic characteristics, lifestyle, 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	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 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.