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SOME ASPECTS OF SOCIO-ECONOMIC AND COMMUNITY FACTORS IN PLANNING URBAN FREeways

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Introduction

Urban freeways have many impacts on their users and on the communities that they traverse or bypass. Consequently numerous interest groups become involved in determining freeway locations. Decision makers at the state and federal levels must weigh monetary and non-monetary consequences as seen by the highway agency and, in addition, must consider the interests and demands of other public bodies, organizations, and individuals, before reaching their decisions. A similar weighing must be applied by decision makers at the local level before they approve or object to proposed plans. As a result, decisions are difficult, time consuming, and involve many value judgments.

Likewise, planning freeway locations is complicated, involving numerous decisions over time regarding location, layout, financing and public policy. In this abstract, these problems are treated firstly, by placing freeway planning in the framework of planned change, and modeling the planning process to fit this concept. Secondly, the problems are examined by looking into the current approaches to planning and decision making on freeway locations in the State of California, in the context of planned change, to see if and how they can be improved. Another aspect of the study related to the problem involves in exploring methods which might be used by planners and decision makers to take into account the significant factors in planning freeway locations.

* This paper is entirely an abstracted material from a larger research study by Stanford University (Project on Engineering Economic Planning) for the California Transportation Agency in 1969-70. The purpose of the study was to investigate the process of planning urban freeways as a large scale public work affecting many groups and individuals. The North Freeway planners and citizens at large should find this extract useful because of the interest such a community project will generate among neighborhood groups in the freeway corridor.
The study appraises possible approaches to planning and methods of evaluating plans and identifies those which might improve and expedite the planning process. The aim is to enhance the engineers' ability to develop plans for freeways, or any public work for that matter, which are in the best public interest.

The Setting for the Study—Freeway Planning in Omaha

Freeway route planning and decision making in Omaha, Nebraska is the point of focus for this paper. Approximately 146,000 persons who live in the Omaha metropolitan area drive automobiles to and from work. The number of vehicles has increased as a result of the population movement from the core of the city to the suburban areas. The metropolitan area contained 321,000 autos in 1970. The projection is 441,000 by 1995.

In reviewing the development of the California Freeway and Expressway system, there seem to be three general conditions which affect the present planning procedures and policies of the State Department of Roads of Nebraska.

1. **Level of Freeway Development.** Even though less than one-third of the urban mileage has been constructed the system is already complex. In studying Los Angeles regional transportation during the period from 1940 to 1960, Horwood, and others\(^2\), identified three stages of freeway development: first, constructing freeways to serve demands from present auto traffic; second, building freeways to serve population spreading into newly developed areas; and third, extending freeways into undeveloped areas which then influenced changes in land use and created new transportation demands. Now, ten years later, freeway development is at the stage of providing cross-connecting and parallel links in the system to serve increased demand and alleviate the congestion in the almost fully developed

\(^1\) Omaha is defined as the urban portion of Douglas County with a population of nearly one half million in 1970.

metropolitan areas. These freeways must be located in built-up areas where corridors are less clearly defined than in the three earlier phases, and where the potential disruption from location of the freeway is much greater.

2. Community Experience. Communities and individual citizens initially have little or no experience with the impact of freeways. They are convinced of the need for facilities because of the congestion experienced on regular state highways and city streets. The freeways are readily accepted as the solution for two reasons: a) the obvious need for greater freedom of movement, and b) no experience with the impact of a freeway by the general populace.

Generally speaking, there are very few urban areas that are unaffected by one or more freeways. Drivers have become accustomed to freeway use, and homeowners and others have experienced the effects of freeways in the community. Although freeways have tremendously aided in speeding and smoothing urban transportation, the motorist is finding congestion on the freeway at peak commuter hours because of traffic generated by expanding population and industry. As more freeway miles have been constructed, communities have experienced what they consider undesirable effects from them. Consequently, it is becoming difficult to gain acceptance of freeway route locations from communities. Conflicts are greatly extending planning times. Furthermore, strong objections are being raised against freeways as the answer to urban transportation problems.

3. Program Planning and Evaluation. The State Department of Roads will be faced with problems in program planning and evaluation. Present conditions seem to suggest a policy of adopting routes far in advance of construction time in order to protect the corridor and allow affected communities and parties an opportunity for long range planning and adjustment. However, this increases the pressure on the budget because of commitments for right-of-way protection on adopted routes. The use of funds for this purport reduces the amount of money
that can be allocated for construction. Thus, while more miles are adopted, it may be that less can actually be constructed. Other complicating aspects of this problem are continuously escalated construction costs and increasingly expensive right of way as the result of more private investment and development. Additional uncertainty in future planning is indicated by the increasing concern about air pollution and the role of the automobile in society, as well as changing potential for the development of mass transit. These issues raise the following questions for the Department in conducting future route location studies: a) What should be the criteria for selecting those routes on which planning studies will be undertaken? b) What procedures should be used in planning urban freeways in the context of the general problems of urban planning? and c) What criteria and methods of analysis should be used in evaluating route locations?

The Need to Review Present Planning Methods

The present level of freeway development, the change in public attitudes through community experience with freeways, and the questions presently raised about the Department of Roads planning program all indicate that freeway planning is at a new stage where it is appropriate to review current planning policy and procedures.

Two general questions provide the framework and objectives for this type of investigation: 4

1) What approaches should be used by engineers and planners in carrying out freeway planning studies?

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4 During the period of the original research undertaken by the Stanford University researchers, the California Highway Commission, in a resolution of December 13, 1968, established an advisory committee on freeway route adoption and design procedures. Many of the significant findings of this study were presented to the committee in their hearing (on June 18, 1969) at Sacramento, California. The current importance of this investigation is also emphasized by the close parallel between its objectives and the areas and topics for research recommended as the result of a recent Highway Research Board conference on transportation and community values (See HRB Special Report, 105, p. 16).
2) What methods and factors should be used to evaluate and make decisions among alternative plans?

Public Works Planning and Decision Making

Planning of public works, including public policy and resource allocation, is difficult and complex. Freeway location is one of a number of engineering planning decisions which usually transcend many physical, political, and social boundaries. Decisions about resource allocations in engineering projects, are, as a result, made in a context of conflicts among diverse interests. For example, the actual design and construction of a freeway is a straightforward application of engineering principles. Before this, however, the engineer and planner should ask: Why do this at all? Why do it this way? and Why do it now?

Some of the difficulties in answering these questions stem from the nature of public works themselves. A completed public work, constructed and in place, represents a definite change which is difficult to reverse. It is literally set down in concrete. Given its permanence, it is critical to determine whether or not this kind of change should be made at all. If it is made, should such a change be made now and in this particular way, or would such an action preclude future opportunities about which adequate knowledge of needs and conditions are now lacking?

A rule that has been suggested by Lindsey (1968, p.5) for application to water resource projects should be given consideration for its general application to public works. Adapting it to a general statement: In situations involving important social and aesthetic values where no agreement can be reached among conflicting interests, a project should be avoided or deferred unless it is clearly essential and there is no reasonable alternative. This rule does not mean the opportunity to build is lost, but that the further opportunity to learn is kept open.

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5 Literature cited henceforth is listed in the references at the end of the paper.
Another aspect of public works is that they have a self-fulfilling nature. Freeway planners ought to be well aware of this fact since they have discovered that if freeways are built, vehicles will use them. Opening a new freeway causes changes in traffic patterns, population, and the economy of the region, which are responsible, at least in part, for creating the traffic that the planners had predicted. Since projects do have a self-fulfilling purpose, it is important to ask: What would realistically be expected to happen if the project were not built?

Finally, it must be recognized that many major decisions in public works are such that they cannot be made by the mathematical or empirical methods of analysis generally used by engineers. Rather, decisions in this area hinge largely on matters of public policy and resource allocation made through the interaction of many diverse interest groups. Bruck, Manheim, and Shuldnier (1967) describe the decisions arising in this setting as "ill-defined" because they include such evolving aspects as possible changes in objectives, the acquisition of new information about the system, changes in the system components, and new information about the environment. In contrast, with well-defined problems there is a clearly defined objective and a systematic way to decide when a proposed solution is acceptable.

**Freeway Planning as a Process of Social Change**

**Freeway and the Process of Change**

The relationship between freeways and social change is one of both cause and effect. In the past, freeways were considered to represent the effect of social and economic change rather than its cause. Viewed in this light, the freeway can validly be considered the effect of such social forces as an expanding population demanding greater mobility, the need for relief of congested transportaton corridors, the desire for transportation and communication links
for the purpose of employment, business, trade, and recreation, the mobility requirements for national defense, and changes in economic conditions which attract people to different areas. Consequently, as McKain (1965, p.19) points out, the attitude toward the highway has been that "if a new road happened to bring benefits to an area, this was an unexpected bonus, or if it brought economic hardship this was dismissed in the name of over-all progress". Accepting the freeway as an effect, planning has been concerned basically with existing or anticipated needs.

The other view is that freeways are instruments of social change since they can generate traffic as well as accommodate it, and can therefore serve to stimulate economic and social change. Community response to the stimulus of the freeway will of course depend on the capacity, ability, and desire to change which exists in the areas to be served and on the suitability of the freeway. This places a significant responsibility on communities and the highway department to determine those changes deemed desirable in the community and the possibilities, if any, for stimulating them through the location and design of the freeway.

A Descriptive Model of Freeway Planning

Just as with the physical problems of engineering, if engineers are to successfully plan public works involving social change, they need models which describe this process. Such models should define the functions of the planning process, and the range of choices open to planners in deciding the means by which to approach planning problems. This includes the types of decisions which are made, the process by which planned change occurs, and the relationships of

6 The Division of Highways has expressed this view in reports discussing issues in route location studies. As examples see: "Golden Gate Freeway: An Examination of the Relationship Between Freeways and Community Values," and "Economic Issues in the Route Study Process: An Evaluation of Community Response to Alternative Route Proposals." Right of Way Research and Development. California Division of Highways, Sacramento, California, April 1965.
the participants in the planning process. With such understanding, the planner can operate more effectively in his role as an agent of change. He can focus not just on the end product of planning, but on how to structure the planning process in order to produce a product which achieves a more widely accepted solution to the wants and needs of society.

Development of the Need for Change

A process of planned change typically begins with problem awareness. This is translated into a need and desire to change. In the relationship between the highway planner and the community, problem awareness should revolve around transportation needs as part of over-all community planning. In the hierarchical decision structure, this planning phase is concerned with the need for new links in the system. The recurring decision in developing the need for change is whether to commence or to defer route location studies on a particular link in the system. The development of need may come from:

1. The Highway Planner. The highway planner, acting as change agent, finds certain difficulties in the community such as congestion on city streets or significant changes in land use, and offers help or takes steps to stimulate the community to an awareness of the problem.

2. The Community. The community becomes aware of difficulties and seeks help. Local desires should be a significant factor in the decision to undertake planning studies on a freeway link. These are usually expressed in the form of resolutions from city and county governing bodies, or requests of state legislators.

3. A Third Party. An industry considering location in the community or a consulting engineer working on traffic problems may suggest the need for more or better highways.

Many problems in planning may be due to the failure of the highway planner and the community to agree on the need for a study. For example, if the highway
planner attempts to convince the community of the need, the community must assess the validity of the diagnosis and the urgency of the proposed studies. If the community suggests the need, then the highway planner must assess the extent of the community's desires for the study. In cases where the highway department decides to proceed with a study unilaterally, as when operating solely on the basis of a rigid program of planning and construction, then the community is likely to be unresponsive. If both agree on the need, then a viable change relationship can be established; otherwise, there could be conflict from the outset.

In developing the need for change, an important consideration, then, is the means by which decisions are made to undertake particular planning studies. Agreement between the highway planner and the community upon the existence of a problem which demands a study of feasible solutions is extremely important.

**Establishment of a Change Relationship**

A workable change relationship between change agent and client system is essential to the success of the planning process. Yet, in freeway location planning, establishing the proper working relationship between the highway department and affected interests in the community is often neglected.

Establishing a successful change relationship requires a "legitimization" of the planning process. This entails a full understanding between the highway department and the communities as to the exact procedure of the study, the institutional arrangements and responsibilities, and the possible ultimate outcomes. All parties need to recognize that the purpose and intent of the study is to select a freeway route location and that a decision will be made. Whether or not the studies will include a no-freeway or "do-nothing" alternative as a possible decision outcome should be stated. The activities and timing in the study, and decisions to be made should be outlined from the time of commencing studies on through the period of construction and adjustment.
Other important factors in establishing a change relationship include:

1. **Client System's Perception of Change Agent.** The community's perceptions of the highway department with respect to estimates of its ability to give help, its inferred motives, and its attributed friendliness or unfriendliness are important to the change relationship. Government agencies, such as a highway department, have a particularly difficult task altering their images as large impersonal organizations into something that they can be dealt with by a community. As Lippitt, et al. (1958, p.134) note:

> Often the client system seems to be seeking assurance that the potential change agent is different enough from the client system to be a real expert and yet enough like it to be thoroughly understandable and approachable. . . (and) will identify himself with the client system's problems and sympathize with the system's needs and values, but who will at the same time be neutral enough to take a genuinely objective and different view of the system's predicament.

In the minds of community interests, the highway department should qualify as the expert in the construction of freeways and demonstrate that they are sensitive to the effects of a freeway on the community. Highway departments must accept the necessity and responsibility of convincing the community that it is prepared to understand and work with the community's needs and values.

2. **The Client System's Role.** If a successful change relationship is to develop, the community must be aware of its responsibilities to the change agent (Lippitt, et al., 1958, pp.134-135).

> ... the client system must. . . (understand) about the kind and degree of effort which must be put forth in the collaboration with the potential change agent. The client must not only understand the arrangement but he must at least tentatively agree to it.

This emphasizes the importance of legitimizing planning so that all parties are agreed and committed to the change process.

Establishing the proper change relationship and legitimizing the planning process are partly organizational and procedural questions.
Figure 3-5. Community Advocacy Planning

Figure 3-6. Arbitrative Planning
Figure 3-5. Community Advocacy Planning

Figure 3-6. Arbitrative Planning
Figure 3-8. Final Decision Methods
Figure 3-8. Final Decision Methods
3. **Community Socio-Economic and Impact Studies.** The aim of the community socio-economic and impact study, as part of the process of legitimization and early planning, is to stimulate the community to define its goals, both short and long range, and to have an understanding of what must be done to meet transportation needs in conjunction with other community objectives. For this type of study to be of any value, it must be done early in the planning process, rather than coming very late or not at all as is the present practice. To accomplish this, continuous contact with the community would be required.

The result of this practice could be to give the planning outfit the role of partner in community development rather than casting it as the villain who is going to tear the community apart. Freeways should be considered in context with other possible transportation alternatives for the community with attention focused on the positive as well as the negative effects of freeways, or other alternative plans.

**The Local Level**

The principal participants in the local level are the mayor and city council members, city planners and engineers, Chambers of Commerce, local business enterprises, service clubs, school districts, neighborhood and homeowner groups, and individual property owners.

The base of a local government's power is its position as representative of community interests and local citizens who will be affected by the freeway location. The local community's right to negotiate freeway agreements provide a means of power by which to effectively block or veto adopted freeway route locations which they will not accept. It also may employ threats, public appeals, appeals to higher authority, and outright propaganda during the evaluation activities.

Local elected officials often find themselves in an uneasy position when questions about freeway location arise in their community. Different alternatives affect the various homeowner groups differently. This will naturally cause an
alignment of these groups against each other. If a local elected official sides with one group against another, he is sure to alienate some of the voters. It is to be expected, then, that he will favor alternatives outside his community, or those that have significantly less effect on his communities.

A community's citizens—those individuals who reside in the community as homeowners, other property owners, or as renters—are generally affiliated with other groups also affected by a freeway, such as business or industrial concerns, church or cultural organizations, and school districts. They are also car owners and users of highway facilities.

The community citizen's scope of power extends specifically to his elected community officials, with the base and means being the authority and power to elect representatives. The power available to community groups should be directed toward local elected officials. In most cases, however, community groups focus their primary attack on the Department of Roads attempting to advance portions of the planning study that are favorable to them, or to prevent any route adoption at all.

**Interest, Pressure, and Information Groups**

Interest and pressure groups which become involved in freeway route location decisions, although they usually have no legal power base, are often in a position to exert considerable influence on the opinions of decision makers because of special means at their disposal, such as economic or political influence.

Information groups, such as the news media, engineering consulting firms, or other outside professional agencies, can also exert influence in route location studies. The base and means of power of outside professional's lies in their technical expertise; or that of the news media in their power to reach and influence citizen opinion.

The first concern of the citizen living within the band of interest on a freeway location study is whether or not a proposed location will affect his
personal property. The following questions should be considered as an important part of the information that needs to be developed in working with community groups:

- When is property appraised for taking, and by whom?
- What are the provisions for refinancing a home if it is taken?
- How are property values adjacent to a freeway affected?
- Can the state be sued for deflated property values?
- Are property taxes raised to make up for property taken from tax rolls?
- What happens if schools, parks or public property are taken?
- Is the entire lot acquired?
- How close can a remaining home be left to the freeway?
- What happens to small parcels left isolated by the freeway?
- What happens to the person who is planning improvements to his home?
- What is the recourse if you do not accept the appraisal of your home?
- Are particular types of neighborhoods singled out for freeway locations?

Another major concern of the citizen is about the timing of these future events, the scheduling of the planning study, and eventual construction of the freeway. They also want to know how the decisions are made, what is considered in making decisions, and what influence they may exert on the decisions. Questions of this nature asked at public meetings were:

- What can a citizen do if he disagrees with the position taken by the city council?
- Don't the large commercial and industrial interests influence the decision to the detriment of the individual homeowner?
- What happens at the public hearings?
- Can a person's concern really make a difference in where the freeway goes?
- Can a city legally prevent a freeway in its boundaries?
- Won't the choice be the cheapest one?
- How much time is required for design, acquisition of right of way, and construction?

The design and operation of the facility is also a subject of interest to the citizens. They realize the advantages to the community provided by a freeway in improving traffic flow and access to the community, as well as some of the problems. Similar questions from public meetings were:

- Where will the interchanges be located?
- What will the freeway do for local traffic congestion and circulation?
- What will happen to the local city streets?
- Will the freeway be elevated, depressed, or at grade?
- Is the freeway meant to bring people into or through the area?
- Will there be provisions to limit truck traffic?

The problem faced by the citizen, and the transportation planner, is that the citizen's interests as a homeowner are often in conflict with his interests as a
road user and his requirements for transportation. A study by Wachs (1968) indicated that community residents see the freeway as having adverse effects on their neighborhoods since they are a source of dirt, noise and smog, and adversely affect the value of their property. However, a majority still believed that a freeway would make the neighborhood more convenient. Although they did not want to live any closer to a freeway than they were now living, 73 percent responded that they would not move if a freeway were built within five blocks of their homes. Individuals, community groups, and planners should realize that freeways produce both positive and negative consequences which must be accounted for in decisions.

**Attitudes Toward Criteria in Freeway Location Planning**

The values placed by decision-making groups on criteria for locating a freeway will strongly influence their reaction to the planning alternatives. Each proposed location alternative may satisfy different criteria in varying degrees. Where decision-making groups have different assessments of the importance of these criteria, then conflicts among decision makers can also be expected. Contrasts in values may help to point up those aspects of the study that should receive the most careful attention. They also suggest those areas where interest groups may be brought into conflict due to differences in the way that criteria are satisfied by the proposed alternatives.

The city planner highly values the preservation of neighborhoods, fitting the freeway to surroundings, and maintaining recreation and park facilities. The aesthetic impact of the freeway on the community also is important. On the other hand, to the city planner cost is of least importance. Furthermore, he is more conscious of the effect of the road on the driver from an aesthetic viewpoint, ranking high views and scenery for the driver whereas other groups may rank it least.
Conclusions

The relationships among highway planners and community groups have an important influence on the outcome of planning and the development of acceptable planning proposals. The positions taken by each of the participants in the planning study are related to: (1) the goals and objectives being pursued by the participant, (2) the participant's perception of the motives and objectives of the others, and (3) the influence that the participants can exert upon one another in the planning process.

The ranking of criteria for route location, and the specification of the information considered to be most important to them in the route study showed that the major concerns and objectives of each community group differed depending on his area of responsibility or role in the community. Elected officials and city engineers are most concerned with the freeway's economic impact, and the community's fiscal structure and ability to provide needed services. The city planners are somewhat more concerned with the social structure of the community and the aesthetic impact of the freeway. Citizens are primarily interested in their own personal property, employment opportunity, and the convenience of travel in the region. While such generalization may vary and should not be applied to other specific cases, it is helpful for planners and community groups to recognize the principal concerns that the others are likely to bring to a planning problem so that consideration will be given to these areas during the study. This divergence in areas of concern also supports the conclusion that planning strategies and methods of evaluation should be adopted which will provide adequate opportunity for representation for all these views.

The Urban Freeway's Effect on the Community System

The effects on an urban community of planning, constructing and operating a new freeway are economic, social, and aesthetic in nature. The full range of
consequences within the community are often referred to in the current literature as community factors or impacts, socio-economic effects, non-quantifiable or intangible effects.

These "impacts" are experienced in terms of both the physical change in the community's form and the human consequences within the community social and economic structure (See Figure 3-3). The human consequences are initially reactions to the changes in the physical environment. These changes alter behavior patterns in urban areas. This is further reflected in the relocation or new location of economic, institutional, or individual activity. The problem in freeway planning is to predict these physical and behavioral changes, and evaluate their consequences to the community.

![Diagram of Freeway Impact](image)

**Figure 3-3: Delineation of Freeway Impact**

**Physical Form.** A freeway physically changes the form of the urban environment and causes alterations in the spatial organization around the facility. This includes such items as distribution and flow of traffic, topographic features, and the removal of physical facilities which are displaced by the freeway. Some of
these may serve as constraints on the physical feasibility of alternatives and as possible means to measure other attributes of human impacts on which values are placed and decisions are based.

**Social Structure.** The freeway's impact on the social structure stems from the effects of its location and use on the economic, social, and aesthetic well-being of the individual members of the community. These are felt first of all as short run effects on displaced families, local municipal governments, neighborhoods, and the market areas of local merchants.

Over the long run, alterations in the time-distance relations between household and areas of economic activity, or sources of supply and the market, eventually solidify into permanent changes in the behavior of the community residents.

**Freeway Impact on Community Groups**

**Users and Non-Users.** Separating freeway impact on the community's social and economic structure into user and non-user effects is helpful as a means of analyzing their relationship and giving them proper weight in decisions on route locations. The user effects result from direct use of the facility, while non-user effects result from the physical existence of the facility. The human, social, and economic consequences of a freeway impinge on activity agents in their roles as either users or non-users of the facility.

Practically all firms, institutions, and households find themselves in both positions, instead of one or the other. This means "user" and "non-user" do not identify two different groups of individuals which receive the costs and benefits of a freeway. Rather, the terms denote a separation of kinds of effects, and the decision maker must weigh the importance of the consequences in one area against the other.

**Market and Non-Market Values.** Freeway impact, set in the framework of the community's activity systems, is experienced by activity agents in terms of market
(monetary) and non-market (non-monetary) consequences. Effects of the freeway which, for users and non-users, can be measured in the market place are termed market costs or benefits. Where no mechanism for measurement by the market exists, the effects to users and non-users are referred to as non-market costs or benefits. For example, a major objective of the freeway is to reduce the transportation costs to the users. Assuming this is accomplished, savings in vehicle operating costs accrue to the user as direct monetary benefit. At the same time, both users and non-users may experience changes in their social or personal well-being which are not measurable in monetary terms through the market place.

**Viewpoint as a Factor in Evaluating Community Effects**

Different alternatives affect the various levels of government, communities, and groups in different ways. Much of today's controversy over freeways results from the failure of one group to appreciate another's values and concerns.\(^7\)

To provide some insight into the principal concerns of the major decision-making groups, a research survey could be used to evaluate the attitudes of highway planners, community officials, and a sample of citizens in the community, toward the route location factors. A few of the results of the survey in the California research showed the degree of importance placed on route location factors by these three groups.

Several of the responses of the three groups, deserve comment. First is the attitude toward vehicle operating costs. They are considered to be of importance by the highway planners; on the other hand, community officials and citizens place practically no importance on them. Second, as expected, the highway planners show less concern for local traffic circulation than do city officials. Third, regarding the factors in community environment such as noise and air pollution, there is much

\(^7\) See HRB Special Report 105 (1969).
more concern by community officials and citizens than by the highway planners. Finally, the factors reflecting neighborhood and social structure were of much less importance to this particular sample of citizens than to either the highway planners or community officials.

These few examples point out the need for considering the various viewpoints in planning studies. Based on the survey, it might be concluded that, from the local viewpoint, highway planners may be putting somewhat more emphasis on parks, the effects on the school system, and cultural and religious institutions than is necessary. On the other hand, the highway planners may not be placing enough emphasis on the impact of freeway locations on the community's economic and fiscal structure.

It would be a mistake to assume that the results of this survey would apply in other situations. On the other hand, they clearly indicate that, at least in this instance, some factors ranked as important by planners are not valued as highly by local officials and citizens. The factors which are most important will, of course, vary with each individual project. Some means, should be used to evaluate every project at the conceptual stage with each affected group expressing its principal concerns. Groups such as school districts and commercial and industrial interests should be considered alongside others. By identifying the factors of greatest concern to each community group, the costs and benefits and the points of agreement and disagreement might be identified. It should be emphasized that the purpose of such evaluation is to eliminate confusion and pointless arguments, and not to assign 'weights' to the factors for evaluation of alternatives.

Time Period

The time period over which the consequences of the various factors are evaluated is also important. Otherwise, short run consequences might be given more weight
in the decision as compared to the long run effects, or vice versa. An example might be the community concern that elderly people would be displaced from their homes in a given area. At the same time, the community master plan may indicate that the area is suitable for high density apartments and a survey may show that the transition is already underway. In this instance, an appreciation of the time factor is important to the rational appraisal of the possible alternatives.

Summary and Conclusions of the California Study

Planning freeway locations is complicated and entails numerous decisions over time regarding location, layout, financing, and public policy. In this research, these problems are treated by:

1) Placing freeway planning in the context of planned social change as a model for describing the planning process. In particular, freeway planning is viewed as a process of social change.

2) Examining the current approaches to planning and decision making on freeway location in the State of California, in the context of social change, to see if and how they can be improved.

3) Exploring methods which might be used by planners and decision makers to take into account the significant factors in planning freeway locations.
Public controversies over freeway location exhibit the characteristics of ill-defined problems, such as complexity of issues and organization, multiple objectives, and a wide distribution of costs and benefits. Yet, despite the fact that much of freeway planning deals with ill-defined rather than well-defined problems, engineers commonly use a deductive approach to planning, assuming a well-defined problem for which a systematic way to decide which proposal is best can be employed. To enable the engineer to better cope with the ill-defined aspects of planning problems, this study presents freeway planning as a process of social change: models are developed which offer him a range of choices in deciding the means of structuring a planning study. With this approach, three components of the planning process are identified and defined as follows:

1. The hierarchical structure of decisions. In freeway planning, this begins with the broad delineation of the study area and ends with a final alignment.

2. The sequential structure of planning activities. These are divided into phases based on studies of planned change, which are:
   a. Developing the need for change,
   b. Establishing the change relationship,
   c. Working toward change,
   d. Stabilizing change, and
   e. Achieving a terminal relationship.

3. The institutional structure and participants in the process. These include highway planners, local officials and staffs, business and industrial firms, citizens, and other special interest groups.

Using these components, a number of possible planning procedures and institutional arrangements are explored at the critical points in the time sequence of the planning process, particularly for the initiation of studies, the planning period, and making the final decision.

During the planning period, the strategy used by the planners is particularly important. "Strategy" is a procedure, established in advance, which determines how, when, and to what depth various parties will participate in the planning, evaluation, and decisions. Possible planning strategies include:
1. Strategy of information—the planner controls the study.

2. Information with feedback—planner controls with feedback from community groups.

3. The coordinator—planner contacts and coordinates with community groups.

4. The coordinator-catalyst—the planner stimulates interaction of community groups, e.g., by a planning workshop including all interested parties.

5. Community advocacy planning—an ombudsman represents community interests in planning.

6. Arbitrative planning—an independent party conducts public hearings and arbitrates differences on planning studies.

The present mode of operation of the Division is more nearly like the strategy of information with feedback than any of the others. To test the attitudes of community officials and citizens toward the Division's planning approach, and to contrast it with other possible procedures, a mall survey was conducted. The results of this questionnaire reflected favorably on many of the practices of the Division, although areas were identified where some improvements are needed. In evaluating the Division's present procedures, and also other planning strategies as possible modifications to the present procedures, a coordinator-catalyst approach seemed most appropriate.

The findings of the survey also show that the decision-making process can be improved by getting local communities involved early in the planning process. To be effective, this approach must accomplish four major objectives:

1) **Legitimization of the planning process.** The study shows that before the Division begins to develop plans, they should have the communities participate in establishing planning procedures and the approaches to be used during the planning process. Points requiring agreement to legitimize planning are:

   a) whether or not the freeway is needed;
   b) the limits of the study area;
   c) how the study will be made;
   d) what individuals, agencies, or groups will participate;
   e) the authority of each participant;
   f) how the study will be organized and conducted;
   g) the means of involvement and interaction of participants;
   h) who will make the decisions; and
   i) some general goals and objectives for the study.
2) **Community participation in planning.** While the Division has been moving toward more community contact in planning, the survey indicates that broader community participation in planning is desired. Among the possible planning strategies, a workshop type planning group encompassing a broad spectrum of community interests was ranked first by the respondents to the survey.

3) **Get the community to actively define its goals.**

4) **Develop freeway plans that will augment other efforts to reach community goals.**

Achievement of these objectives can be expedited by:

(a) Maintaining continuous contact with communities in order to foresee when planning studies are needed, and

(b) When a study is made, to perform the socio-economic and impact studies early in the planning process to form a basis for community interaction and proper formulation of plans.

Development of effective community participation has the following implications for the Division of Highways:

1) Develop educational and research programs to give personnel a broader view of communities problems.

2) Develop continuous interchange with local communities.

3) Assign and educate personnel to carry out the function of the planner as a coordinator and catalyst to develop community consensus.

The research also identifies the important socio-economic and community factors that influence route location decisions and explores present methods for describing, analyzing and presenting the principal variables to decision makers at all levels. A method for decision making among freeway location alternatives in urban areas that incorporates both user and community consequences is proposed. Since such decisions are extremely complex and involve many variables, a step by step procedure which can both systematize and simplify the decision-making process is also presented.
Correct decision making requires the application of two basic principles:

1) That decisions must be based on the differences among alternatives, and

2) That money consequences must be separated from consequences not reducible to money terms; then the irreducibles must be weighed against money consequences as part of the decision-making process.

Present decision methods based on economic analysis or point weighing schemes are found to be deficient in the proper application of these principles. Additional problems with factor weighing methods arise in developing common units of measure for variables, assigning values, weighing viewpoints, and oversimplification of information.

The proposed method presents a list of user and community factors as a basis for analysis. These are separated into a) the direct economic effects, and b) the community effects, in keeping with principle (2) above. In order to make the community effects more understandable, a graphical procedure called the factor profile is offered as a tool for analyzing them. In addition, tentative numerical measures for quantification of community factors are suggested along with an indication of the effect of the factor over time.

The method of decision making is a series of paired comparisons using engineering economic analysis and factor profiles. In comparing two alternatives the incremental cost or benefit from the economic analysis is weighed against the differences in community impact between the alternatives as shown by the factor profiles. Since an attitude survey including highway planners, community officials, and citizens showed the need and importance of recognizing different viewpoints in the analysis, it is proposed that the comparisons can be made from the viewpoint of each group in the community. These preferences can then be considered in making the final decision.

The factor identification and factor profile approach can also be a useful tool during the planning process in a) defining factors important to community
groups, b) establishing goals, and c) developing alternatives. It also offers a visual aid and a systematic procedure which could well eliminate much of the off-target discussion that usually accompanies freeway planning.
REFERENCES


