DEVELOPMENT OF GUIDES FOR COMMUNITY ACCEPTANCE OF HIGHWAY LOCATION, DEVELOPMENT, AND CONSTRUCTION

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Protests over highway location, design, construction, and related factors have been and are nationwide, partly because of a belief that highways are planned primarily in terms of rather rigid engineering specifications to the virtual exclusion of environmental, attitudinal, and other human related factors. The attitudes and goal preferences of public and private citizens need to be more effectively integrated into planning for highway investments, and the goal priorities of citizens relative to the location, design, and construction of highways need to be ascertained and integrated with the goals of the highway planners. The basic objective of this exploratory research was to develop and test a methodology for determining goals for highway transportation and criteria for implementing the goals that have the highest priority in terms of both desirability and importance as perceived by a representative cross sample of public officials and private citizens. Social and aesthetic goals, economic and fiscal goals, and physical goals were ranked by the 2 groups of respondents. The 2 groups then responded to criteria for obtaining increased levels of aesthetics, increased economic and fiscal goals, coordinated and comprehensive planning, increased levels of safety and health, and increased levels of efficiency.

•PROTESTS over highway location, design, construction, and related factors have been nationwide, and a search of newspapers and other media reveals numerous objections and complaints by groups such as conservationists, those concerned with the preservation of historical sites, and school officials and boards of education. A host of related complaints have also been heard from citizens and organized groups relative to the more general areas of economics, aesthetics, racial problems, and similar facets of impact. The seriousness of the problem is reflected in the following statement from a major national magazine (1):

> War is too serious a matter to leave to the military, wrote Talleyrand. Highways, claim a rising chorus of angry citizens, are too serious to leave to traffic engineers. The analogy isn't too fanciful. In New Orleans, Milwaukee, Boston, New York, Atlanta, and a score of other cities, desperate bands of home owners, school officials, churchmen, businessmen, conservationists, architects, and urban planners are waging pitched battle against highway engineers. The engineers want to build freeways that rip through residential and commercial areas, carve up parks, bulldoze historic sites, and displace homes, schools, and businesses.

In New Orleans, for example, the battle raged as loudly as any place in the nation because of the decision to build an elevated freeway along the Mississippi River bank into the downtown area proximate to the Vieux Carre. This was bitterly opposed by

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many citizens in spite of the endorsement of the downtown businessmen. The struggle became so bitter that Morris Ketchum, Jr., then president of the American Institute of Architects, resigned from the Bureau of Public Roads Advisory Committee on Highway Beautification. Ketchum stated that he was "in a petunia-planting job" and that "interstate highways are being built through cities with disastrous results" (1). After a long and bitter controversy, it was decided to cancel the roadway and to reallocate its Interstate mileage to the proposed Metropolitan New Orleans Beltway, even though this will involve an outlay of many additional millions of dollars and take additional years to complete.

Numerous other instances of similar problems can be cited. For example, the elevated Embarcadero Freeway in San Francisco so embittered citizens that construction of the new expressway was halted. In Milwaukee, a group managed to get the issue of expressway location on the ballot in a city election, in spite of the engineers' vows to continue on schedule with the original plan. Within Alabama, the Department of the Interior refused to allow the construction of I-65 across the Tennessee River and through Wheeler National Wildlife Refuge until the Federal Highway Administration made modifications in routing and construction that amounted to an additional cost of more than $3 million so as to preclude destruction of a haven for thousands of Canada geese.

A major part of the problem is that, traditionally, highway planners apparently have felt no pressing need to consider the complaints of citizens (in times past, often token and unorganized) or the more far-reaching, but less quantifiable, effects of their actions, particularly if adequate initial monetary remuneration was forthcoming for affected citizens.

Plans, therefore, were often formulated for the location, design, and construction of highways based only on limited information such as design specifications, type of terrain, and rather rigid engineering specifications. Virtually excluded were environmental, attitudinal, and other human related factors. Furthermore, these plans traditionally were formulated by individuals with similar backgrounds, specializations, and professional interests. Little or no communication occurred with groups and individuals affected or interested or both other than at required public hearings. Because of this type of approach, plans often were developed and, in effect, imposed on citizens without their support of the planned investment.

Decisions developed in this manner are based on supposedly "objective" criteria or guidelines that decision-makers traditionally have felt can be defended in terms of economics, efficiency, or similar standards. For many public policy decisions this is a valid premise. However, for decisions related to investments such as highways, the results can be controversial and reaction often transcends rational boundaries—primarily because such issues as location and right-of-way affect individual citizens and interest groups in different ways and with different degrees of severeness. The reactions are especially strong when citizens have not had a major part in the initial planning process and have not been adequately informed of the effects of the investment on their area.

Moynihan set the stage for the conflict that he perceived would inevitably have to occur as a result of this approach to highway planning when he stated the following in 1960 (2):

> The crisis has come. It has been impossible for the cities to resist the offer of unprecedented amounts of money, however futile they might know it would be to spend it on highways alone. In one metropolis after another the plans have been thrown together and the bulldozers set to work. Here and there, as in Milwaukee, a vigorous and established planning authority has been able to get intolerable plans redrawn. But in general, the program is doing about what was to be expected: throwing up a Chinese Wall across Wilmington, driving educational institutions out of downtown Louisville, plowing through the center of Reno. When the interstate runs into a place like Newburgh, New York, the wreckage is something to see. Down the Hudson, Robert Moses is getting set to build Canal Street Expressway, the first hundred-million-dollar mile.

New approaches to the planning of highway investments are beginning to occur, however. At the Second National Conference on Highways and Urban Development, for ex-

ample, certain basic principles were established that recognized that transportation is but one element in the total concept of urban planning and, therefore, cannot be evaluated as a separate and individual function. The following was stated in the report (3):

> Planning agencies should emphasize the identification and evaluation of urban values and goals as an integral part of comprehensive transportation planning. There should be encouragement of research to develop more systematic techniques for rating all values and costs to be weighed in evaluating urban plans.
>
> The planning and development of facilities to move people and goods in urban areas must be directed toward raising urban standards and enhancing the aggregate of community values, both quantitative and subjective; it should be recognized that transportation values (safety, comfort, beauty, convenience, and economy of transportation) are a part of, and are to be given proper weight in, the total set of community values.

Change is also starting to occur at the operational level, as witnessed by the statements of prominent government officials. Whitton, for example, has stated the following (4):

> Contrary to popular misconception that the highway planner has a bulldozer mentality, the profession in the past has been increasingly concerned with aesthetic and human values. If highway departments have been unable to meet all demands by all interests, it is not out of apathy or cussedness. Rather, it is that the non-traffic demands are frequently conflicting among themselves, and often exorbitant. Highway planners, like all planners who work in the partial world of real projects, find that it is always necessary and usually difficult to obtain a reasonable balance between public needs and desires and the available highway resources.

As these statements indicate, agreement is present that there is a need for integrating the attitudes and goal preferences of public and private citizens into planning for highway investments. For example, research must be performed that will lead to the development of a means for ascertaining the goal priorities of citizens relative to the location, design, and construction of highways and for integrating these goals with the goals of the highway planners. The need for exploratory research to at least partially resolve these increasingly pressing problems provided the rationale for the research reported here. The basic objective of this exploratory research was to develop and test a methodology for determining goals in highway transportation that have the highest priority in terms of both desirability and importance as perceived by power structures and opinion leaders in both public and private sectors.

THE RELATIONSHIPS OF GOALS TO PLANNING

The justifications of comprehensive planning in decisions related to highways are well documented. However, operational approaches to the process are still in a rather embryonic state of development. There is a need for an approach, particularly at the community or regional level, that will yield a framework for the analysis of a total situation, a methodology for identifying and ranking goals and assigning priorities to them, and a theory or framework for communication that ensures the mutual accomplishment or accommodation of differing systems of goals. Through this type of coordinated planning, initially diverse goal structures may be resolved to accommodate the objectives of all individuals or groups affected by the planned highway investments.

The basis of such an approach to planning must be a commonly recognized and accepted set of goals and criteria. The difficulty, however, is in the derivation of these mutually acceptable sets. Numerous conceptual schemes have been offered to aid the planner in this process, but none has proved entirely satisfactory. Usually, the difficulty is not in determining long-term ultimate ideals but rather in obtaining agreement on the means for attaining these ultimate ideals, such as safety and efficiency.

In the past, most planners have relied primarily on intuitive insights in terms of the needs, desires, and aspirations of the groups for whom they were formulating goals and assigning priorities. Traditionally, therefore, goals to be accomplished in highway investments have not been derived through the application of rational analysis. In spite of these difficulties, a planner must still be guided by some concept of the public inter-

est. According to this concept, the plans formulated ideally should reflect concerted behavior to achieve goals thought to be beneficial to all segments of the public. The planning process is further complicated by the fact that these goals are constantly shifting, are likely intermediate rather than final, and are more in the nature of criteria than of concrete destinations (5). In addition, the planner must also make the sometimes heroic assumption that the goals of the various affected groups can be at least roughly structured into a meaningful hierarchy and, in this manner, assigned priorities.

Additional difficulties complicating the problems of the highway-engineer-planner are man's limited problem-solving capabilities, the lack of truly comprehensive information, the costliness of comprehensive analysis, the inability to construct a satisfactory method for evaluating values or goals, the closeness of the observed relationships between fact and value, the openness of systems of variables, and the analyst's need for strategic sequences of analytical moves (6).

THE COMPLICATED NATURE OF THE GOAL-FORMATION PROCESS

Much of the difficulty in obtaining agreement on a mutually acceptable set of goals and goal priorities exists because of a lack of understanding of the process of goal formulation. It is important to realize that goals evolve from the desires of an individual and become group and intergroup goals and, perhaps eventually, regional or societal goals.

The concept of goals has been studied in great detail by philosophers, educators, psychologists, professional planners, and others. The studies, however, have been more successful in determining the differences in uses of goals than in establishing bases for their group formation and resolution. The following statements depict the complications involved in determining and understanding goals of individuals, groups, and society:

1. Goals are relative to the activity, the future, and the environment with which individuals and society are confronted;
2. Goals imply ends and the meaning of accomplishing ends and also reflect purposive action and the striving to accomplish ends with reason;
3. Goals are dynamic and can be both the cause and the effect of action, and aspirations are reciprocal to action itself;
4. Goals have common and joint characteristics between and among individuals and groups, are partial reflections of the total society, and are composites of shared and nonshared individual and group goals;
5. Goals reflect value systems—some highly qualitative and some with quantitative overtones—all based on conscious or subconscious assumptions and individual or collective motivations; and
6. Goals may be ordered or unordered, may reflect unity or disunity, may reflect society or the individual or composites of both, and when in conflict in a free and open society may result in confrontation, pressure, influence, bargaining, coaptation, and coalition.

Another basic problem is in determining the values of all the goals that are important to the various groups involved in the planning process and in discovering the relationships between and among these goals. Once goals have been identified, agreement must still be forthcoming in terms of specific criteria designed to ensure the implementation of the goals.

ESTABLISHMENT OF GOAL HIERARCHICAL STRUCTURE

Meaning of Opinions and Attitudes

Attitudes are of primary importance in influencing the goal priorities of citizens. As such, an investigation of attitudes relative to highway investments is one way of inferentially determining the goal structures of individuals relative to these types of investments. Opinions and attitudes are common to all people and, hence, are an integral part of the goal formation process. They represent the composite of experiences through time and, as such, constitute the major components of one's personality. The

existence of these attitudes may be observed and inferences drawn either from nonverbal overt behavior or from symbolic verbal behavior (opinions).

Interest in attitudes stems from the fact that there is a demonstration relationship between value patterns (as expressed by attitudes) and individual behavior. By scaling or ranking an individual's attitudes toward given objects or events, one can depict their relationship to his values. By extrapolating results obtained from the attitude scales, it is possible to predict behavior patterns or to establish goal priorities or to do both. The accuracy of prediction is, of course, a correlate of an individual's ability and desire to answer with objectivity and accuracy. If time were not a factor and individuals could report their attitudes with 100 percent accuracy, then less doubt would remain as to the validity of attitudes expressed. However, because time is a factor involved in any process and because individuals are usually unable or unwilling to express their attitudes with complete accuracy, the expression of an opinion is not necessarily a perfect method of communicating either values or goal systems and priorities. Even so, attitudes, as expressed through opinions, are currently the most reliable guide a researcher has for establishing goal priorities in lieu of a prolonged period of empirical observation of behavior. Relative to these points, Davidoff and Reiner have stated the following (7):

> We plan in a world of limited knowledge, a world in which facts are probabilistic and values debatable. Under such circumstances "correct" decisions do not exist. The merit of a decision can only be appraised by values held individually or in a collectivity, but such values . . . are not verifiable. In such a situation, the goal for decision-making should be increasing the degree of assurance (of decision-makers and clients) that the choice made was at least as reasonable or more reasonable than any other alternative. This goal is best attained by bringing to bear on every decision the greatest amount of relevant information concerning the ramifications of all alternatives.

STUDY METHODOLOGY IN ANALYSIS OF CRITERIA AND GUIDES FOR COMMUNITY ACCEPTANCE OF HIGHWAY LOCATION, PLANNING, AND DEVELOPMENT

The reputational approach often employed in sociological research was utilized to identify a power elite, or group of influential people, for inclusion in the research effort. An initial contact was established with a cross-sectional group of top level public and private persons to have them identify people of influence in specific areas of public and private responsibility. Contacts were established with persons in municipal government, business executives of successful corporate enterprises, professional planners, eminent political scientists in the area, representatives of labor, and similar groups. Both white and black citizens were contacted in this effort. A consensus relative to identified individuals was developed from among the names suggested by these citizens. Persons were suggested in the following realms for inclusion in the final interviewing effort: labor relations, social planning, neighborhood development and redevelopment, race relations, employment and regional development, civic leadership, educational planning, financial expertise, transportation planning, health planning, county and city government, environmental quality (including beautification, recreation, and conservation), real estate, public housing, law enforcement, traffic and sanitary engineering, and communication media. A total of 61 in-depth interviews were conducted with those identified.

Responses to sets of specified working goals were obtained from these persons through the use of an ordinal (ranking) scale. Lists of working goals developed from intensive literature reviews relative to the goals of highway planning were grouped under the headings of social and aesthetic goals, economic and fiscal goals, and physical goals. The goals ranked were as follows:

1. Social and aesthetic goals—landscape areas attractively; reduce air and water pollution; preserve historic sites and buildings; expand system of parks; preserve and maintain open spaces; reduce noise levels; preserve and enhance natural features of the land; protect and accommodate wildlife; coordinate on a wide scale of beautification programs within individual communities and the region; and preserve neighborhood integrity (i. e., highways do not split neighborhoods).

2. Economic and fiscal goals—increase industrial expansion and employment opportunities; use land economically in highway construction; reduce vehicular operating costs (in terms of fuel and oil consumption, and maintenance); practice economy in highway construction and in land acquisition; enhance development of historical, cultural, and recreational facilities of an area; expand market areas for industry; lower operating costs in providing municipal service (i.e., garbage collection, police protection, and municipal bus service); reserve in advance land for future highway locations; coordinate more closely city, county, regional, and state planning departments in development plans; and reduce accident rates.
3. Physical goals—place convenient entrance and exit points on major traffic arteries; have faster flow of traffic; provide more convenient access to shopping facilities; have better coordination of parking facilities with traffic flow; improve lighting systems along highways; improve system of roads and streets interconnecting with major traffic arteries; increase accessibility to the central business district; retard urban blight; reduce unpleasant visual effects; and provide a more convenient and better coordinated system of public transportation.

Goals grouped under each of these headings were ranked by respondents to enable the researchers to ascertain the relative congruity in the responses of the public officials and private citizens to each of the sets of goals. After identification of the points of agreement on working goals, a second set of responses was obtained for specific sets of criteria designed to lead to the implementation of the working goals. Criteria were as follows:

1. Criteria for obtaining increased levels of aesthetics—maintain integrity of homogeneous land use areas as they exist and as they are planned for the future; incorporate parkway features in the roadways to contribute to open space and increased levels of safety and beauty; incorporate greater simplicity in construction of roadways, bridges, and apparatus such as guardrails and signs; utilize, protect, and accentuate site and terrain features included as part of the specifications for a roadway; utilize and protect all man-made and natural features that might contribute to the beauty of the roadway before selection of final routes; eliminate all scars including borrow pits and old, replaced, or abandoned highway structures resulting from roadway construction or improvement; divide highway into 2 one-way roadways, each independent of the other, and perhaps located several blocks apart; plant right-of-way to enhance aesthetic assets and increase levels of safety; use depressed roadways in urban areas to preserve the aesthetic qualities of an area.
2. Criteria for obtaining increased economic and fiscal goals—initially acquire extra acreage to accommodate highway expansion; jointly (state highway departments and local agencies) purchase and develop freeway-recreation corridors; make multiple use of urban freeway rights-of-way for things such as commerce, recreation, and housing; route roadways in urban areas through undeveloped land, blighted areas subject to redevelopment, eroded lands, or the like; purchase properties at true and reasonable replacement values rather than at fair market value; give highway department authority to condemn and to purchase lands adjacent to proposed roadways, the excess land to be sold as improved property to offset the cost of highway improvement; acquire in advance roadway rights-of-way while areas are still vacant and before they are developed for more intensive use; route roadways adjacent to or upon natural barriers such as rivers and hillsides; concentrate traffic flow in heavily developed areas through use of multilevel, split-level, depressed, and elevated cross sections; allow private developments of highway rights-of-way.
3. Criteria for obtaining coordinated and comprehensive planning—make available advance information on roadway proposals to all agencies and organizations concerned or affected or both; have a highway engineer present on all community, regional, and state planning boards; coordinate all physical planning in the state through a statewide environmental planning commission; form a regional review board to appraise and recommend all major highway proposals; standardize land use and zoning regulations by city size; coordinate advance right-of-way acquisition to meet all public needs; ensure that land-takings for roadways do not isolate remaining property; coordinate highway

planning with urban renewal to fuse highways, parks, and housing; use right-of-way in common with other areas; hear or receive sufficient public testimony to obtain a clear picture of all facts, alternatives, and proposals prior to making a decision.

4. Criteria for obtaining increased levels of safety and health—have one-way lanes or reversible lanes or both in congested areas; eliminate multichoice route decisions; have roadway medians available for pedestrian shelters; separate expressway, local, and pedestrian traffic by level, distance, or structural barriers; have continuous shoulders on both sides of the roadway; do not separate moving vehicles from the pull-off shoulder by more than one traffic lane; have no entrance or exit ramps in the vicinity of a primary interchange; require automobile radios to be equipped with special channels for receiving official highway information; avoid abrupt changes in roadway capacity and alignment; feed local streets into collector-distributor streets before joining the expressway by ramp.

5. Criteria for obtaining increased levels of efficiency—designate selected streets exclusively for bus movement; prohibit curb parking in congested areas; route trucks traveling into major areas into separate corridors; gear roadway systems specially to traffic generators such as stadiums, airports, regional commercial centers, industrial areas, and schools; prohibit entrance or exit points along the central business portion of freeways; prohibit driveway entrances and exits in congested areas; initially acquire advanced rights-of-way to expand partial interchanges to full interchanges; use space below elevated freeway structures for commercial, light industrial, parking, or other types of public or private land use; prohibit angle parking in urban areas; require all new buildings in downtown areas to provide sufficient off-street parking facilities.

Techniques of Data Collection and Analysis

Respondents ordinally ranked the working goals and the criteria via a forced-choice process in terms of both importance and desirability. The results of these 2 scaling processes were then combined to yield a "desirability-weighted-by-importance" index as has been suggested by Riedesel and his colleagues at Washington State University. Research traditionally has focused separately on either the importance or the desirability of given working goals or criteria in highway location and has often been accomplished largely without a forced-choice ranking of the items by the respondents.

A distinction between the desirability and the importance of given items to affected groups is necessary to develop insights into goals and attitudes of the respondents. For example, achievement of a working goal such as "attractively landscape areas" may be ranked very high in terms of desirability but may be ranked low in importance relative to such goals as "reduce air and water pollution" or "preserve neighborhood integrity." This type of index serves to effectively reveal a balance between desirability and importance in the minds of the respondents and, therefore, provides planners with more meaningful information on which to base decisions when choices and trade-offs are necessary in the achievement of a series of possible working goals. An illustrative application of this approach is given in Table 1. All of the goals listed may be both desirable and important, but the forced-choice process reveals desirability or importance relative to the other goals listed. Adding the desirability and the importance rankings yields a composite score. For example, a goal of combined highest desirability and importance would have a score of 20 (preserve neighborhood integrity, in the table). A neutral goal would have a numerical ranking of 10, and goals with progressively lower priorities would have lower rankings. For example, a combined desirability and importance ranking of 8 would indicate that the goal had a much higher combined priority than a goal with a combined priority ranking of 2.

Both the nonparametric Kendall coefficient of concordance and the Mann-Whitney U-test were applied to the forced-choice rankings of each of the sets of working goals and criteria as well as to the desirability-weighted-by-importance indexes to determine areas of agreement and disagreement between the public officials and the private citizens in terms of the ranks assigned to each of the goals and criteria grouped under the previously identified headings.

TABLE 1

COMPUTATION OF A DESIRABILITY-WEIGHTED-BY-IMPORTANCE INDEX

Goal	Desirability Ranking (10 to 1)	Relative Importance Ranking (10 to 1)	Desirability-Weighted-by-Importance Index
Attractively landscape areas	8	3	11
Reduce air and water pollution	6	9	15
Preserve historic sites and buildings	2	6	8
Expand system of parks	5	1	6
Preserve and maintain open spaces	9	4	13
Reduce accident rate	4	8	12
Reduce noise levels	3	7	10
Preserve and enhance natural features of the land	7	5	12
Protect and accommodate wildlife	1	2	3
Preserve neighborhood integrity (i.e., highways do not split neighborhoods)	10	10	20

FINDINGS

Analysis of the Working Goals by Public Officials and Private Citizens

The ranking of the social and aesthetic goals, the economic and fiscal goals, and the physical goals by the public officials revealed a level of internal consistency significant at 0.01. This implies that the public officials perceive a similar hierarchy in terms of both the importance and the desirability of the goals they were asked to rank. The resulting computed index also revealed a level of consistency significant at the level of 0.01. Internal consistency significant at 0.01 was also found for the 3 sets of goals ranked by the private citizens in terms of importance, desirability, and computed index. Internal consistency was significant at the level of 0.01 for the total aggregated sample of public officials and private citizens for all 3 sets of rankings. The rankings of the sets of working goals and criteria statements were tested for congruity via the application of the Mann-Whitney U-test.

1. Generally, the desirability and importance rankings assigned to the social and aesthetic goals by the 2 groups were congruous. Congruity significant beyond 0.01 was found for 9 of the 10 goals ranked. Preservation of neighborhood integrity in highway location was the most desirable of the 10 goals ranked by the 2 groups.
2. Ranking second to preservation of neighborhood integrity in terms of desirability was "reduce air and water pollution." Goals ranked lowest in desirability were "expand system of parks," "preserve and maintain open spaces," and "protect and accommodate wildlife."
3. Generally, high levels of congruity were present in the rankings of economic and fiscal goals by the public officials and private citizens. Both groups ranked "reduce accident rates," "coordinate more closely city, county, regional, and state planning departments in the development of long-range comprehensive development plans," and "increase industrial expansion and employment opportunities" as being the most important and desirable goals among those ranked.
4. In general, congruity was present in terms of the desirability and importance rankings of the physical goals by the public officials and private citizens. However, in 2 instances notable disagreement was present. The public officials consider "have faster flow of traffic" significantly more important and more desirable than do the private citizens. Also, private citizens ranked "retard urban blight" much more important and desirable than did public officials. The highest ranked goals by both groups in terms of desirability and importance were "place convenient entrance and exit points along major traffic arteries," "provide a more convenient and better coordinated system of

public transportation," and "improve system of roads and streets interconnecting with major traffic arteries."

Analysis of Responses to Criteria by Public Officials and Private Citizens

After agreement concerning the specific working goals in terms of desirability and importance was ascertained, both public officials and private citizens responded to the appropriateness of specified criteria for implementing the goals. An analysis for congruity was undertaken for the 5 sets of criteria. Internal consistency significant at the level of 0.01 in terms of both desirability and importance was found in the rankings of the sets of criteria by the public officials. Consistency in the desirability and importance rankings of the criteria by the private citizens was significant at the level of 0.01 with one exception—congruity relative to criteria for implementing the goal of increased levels of aesthetics was significant at the level of 0.05. Mann-Whitney U-tests were performed to ascertain the level of agreement in the rankings of the sets of criteria in terms of both desirability and importance by the public officials and the private citizens.

1. Agreement in terms of desirability and importance for criteria designed to implement goals for obtaining increased levels of aesthetics was high. Statistical disagreement was present on only one item in each instance, and even then the rankings assigned did not differ by a large magnitude. The criteria for which congruity was present in terms of desirability and importance were "maintain integrity of homogeneous land use areas as they exist and as they are planned for the future," "incorporate parkway features in roadways to contribute to open space and to increased levels of safety and beauty," and "eliminate all scars, including borrow pits and old, replaced, or abandoned highway structures resulting from roadway construction or improvement."
2. A high level of agreement existed as to the desirability and importance of criteria for implementing economic and fiscal goals, as viewed by both public officials and private citizens. Statistical disagreement was present in only one instance in terms of importance and twice in terms of desirability. Large amounts of disagreement existed between public officials and private citizens as to the desirability and importance of "purchase properties at true and reasonable replacement values rather than at fair market value." The private citizens were strongly in favor of the purchasing of property at true and reasonable replacement values. This criterion was ranked as highest in terms of both desirability and importance by the private citizens. On the other hand, it was assigned a very low ranking in terms of both desirability and importance by public officials.

Overall, the criteria ranked highest in desirability and importance for implementing economic and fiscal goals by public officials and private citizens were "acquire in advance roadway rights-of-way while areas are still vacant and before they are developed for more intensive use" and "initially acquire extra acreage to accommodate highway expansion." The 2 criteria ranked lowest in terms of importance and desirability by both public officials and private citizens were "give highway department authority to condemn and to purchase lands adjacent to proposed roadways, the excess land to be sold as improved property to offset the cost of highway development" and "allow private developments on highway rights-of-way."

3. Generally, high levels of agreement were present in terms of the desirability and importance of specific criteria for implementing goals designed to obtain coordinated and comprehensive planning. Large amounts of disagreement were present on only one criterion: "coordinate highway planning with urban renewal to fuse highways, parks, and housing." In all instances, this criterion was ranked much higher by public officials than by private citizens.

The criteria ranked highest in desirability and importance by both groups for achieving coordinated and comprehensive planning were "make available to agencies and organizations concerned or affected or both advance information on roadway proposals," "coordinate all physical planning in the state through a statewide environmental planning commission," and "hear or receive sufficient public testimony to obtain a clear picture of all facts, alternatives, and proposals prior to making a decision." The criteria

ranked lowest in importance by both groups were "use right-of-way in common with other agencies" and "standardize land use and zoning regulations by city size."

4. Relatively large amounts of disagreement were present between public officials and private citizens with respect to criteria for obtaining increased levels of safety and health. For example, private citizens were more in favor of continuous shoulders on both sides of a roadway than were public officials. Public officials more strongly favored no entrance or exit ramps in the vicinity of primary interchanges than did private citizens. Public officials were also more in favor of local streets feeding into collector-distributor streets before joining the expressway by ramp than were private citizens.

5. Generally, levels of agreement as to criteria for implementing goals for obtaining increased levels of efficiency were high. Major disagreement was found only on one criterion. Public officials consistently ranked the criterion "designate selected streets as exclusively for bus movement" low, while it was ranked rather high in terms of desirability and importance by private citizens. The criteria entitled "route trucks traveling into major areas in separate corridors" and "require all new buildings in downtown areas to provide sufficient off-street parking facilities" were ranked high in desirability and importance by both public officials and private citizens. Conversely, the criteria "use space below elevated freeway structures for commercial, light industrial, parking, or other types of public or private land use" and "prohibit angle parking in urban areas" ranked low in desirability and importance by both groups.

CONCLUSIONS

1. The responses of the public officials and private citizens depicted high levels of agreement concerning criteria for obtaining increased levels of aesthetics and criteria for achieving specified economic and fiscal goals. Implementing mutually acceptable goals and criteria in these 2 areas should not be a major problem in future highway investments.

2. The question of replacement value versus market value in terms of compensation for removal of structures in the path of the highway was an area of major disagreement. The private citizens strongly felt that replacement values should be awarded for any structures removed. On the other hand, the public officials were opposed to this. It seems that the public officials tend to view this type of problem within the framework of the total amount of money available to spend, while private citizens apparently are less concerned about costs. Private citizens tend to view the problem more in terms of a perceived sense of justice and fair play from the point of view of the affected citizens.

3. Neither the public officials nor the private citizens favored the purchase and resale of property by the highway department. This situation seemingly was viewed as being readily subject to exploitation by individuals with a large amount of power in a given area. In addition, the respondents apparently felt that a public agency should not be in potential competition with private enterprise.

4. Both the public officials and private citizens were in strong agreement regarding the pressing need for additional coordinated and comprehensive planning relative to highway investments. Also, both groups strongly favored having major public investment information available to affected groups and citizens well in advance of the actual construction of the roadway.

5. The private citizens were strongly against the use of highways as urban renewal devices. This approach was viewed somewhat more favorably by public officials. Private citizens felt that the highway route chosen should not necessarily be the least inexpensive one and that all classes of citizens as well as business firms should have to bear the effects of highway route location.

6. There was no overall strong desire on the part of either the private citizens or the public officials for the multiple use of land below elevated freeways for things such as parks, playgrounds, and general recreational needs—at least relative to other goals. Selected spokesmen for minority groups did favor these possibilities, however. They stated that for them land is difficult to obtain and usage of this land would alleviate certain problems such as lack of recreational space.

7. Public officials and private citizens strongly favored the reduction of accident rates. This took precedence over all other items rated. The consensus was that a dollar value could not be attached to this and that no efforts should be spared to increase levels of safety.

8. Preservation of neighborhood integrity and the achievement of similar aesthetic goals were viewed as having higher priority by the private citizens than by the public officials when forced choices were necessary. The private citizens felt that narrowly conceived benefit-cost frameworks should be abandoned as a basis for this type of analysis. However, the public officials perceived any abandonment of traditional benefit-cost frameworks as unrealistic, given the present financial structure of most metropolitan areas.

9. Industrial expansion and economy in highway construction and other services were ranked higher in priority by the public officials than by the private citizens. The public officials apparently felt that, realistically, all decisions must be decided in terms of economics or similar standards. They perceived that, given additional jobs and an expanded and diversified economic base, matters related to aesthetics, beautification, pollution, and the like would develop as a natural by-product of more jobs and higher per capita income.

10. Private citizens were intensely interested in having an active part in planning for any major public investments that would affect their life styles. This interest was evidenced by the high ratings assigned to coordination of all planning activities on a wide scale, and the availability of advance information on major public investments.

FINAL REMARKS

Highway engineer-planners in deciding on the location, design, and construction of highways are under increasing pressure to give more explicit recognition to the social, attitudinal, environmental, and other effects of highway investments in formulating plans for these investments. Movement beyond the use of the traditional benefit-cost ratios conceived primarily in terms of economics is a difficult and frustrating process because of the difficulty of measuring environmental and similar related effects. However, the conceptual framework and the methodology developed in this research perhaps represents a logical step in the necessary direction if the decision base is to be sufficiently broadened to give more explicit recognition to the total spectrum of benefits and costs as related to highways. In any event, this process represents one way of dynamically involving all citizens in planning for these investments and of giving recognition to the goals and goal priorities of the affected citizens.

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REFERENCES

1. The War Over Urban Expressways. Business Week, March 11, 1967, p. 94.
2. Moynihan, D. P. New Roads and Urban Chaos. Reporter, Vol. 22, April 14, 1960, pp. 19-20.
3. Highways and Urban Development. Second National Conf., American Assn. of State Highway Officials, National Assn. of Counties, and National League of Cities, Williamsburg, Va., 1965.
4. Whitton, R. M. Highway Location: A Socio-Economic Problem. Parks and Recreation, Vol. 1, Jan. 1966, p. 26.
5. Altshuler, A. The Goals of Comprehensive Planning. Jour. of American Institute of Planners, Vol. 31, Aug. 1965, p. 186.
6. Bolan, R. S. Emerging Views of Planning. Jour. of American Institute of Planners, Vol. 33, July 1967, p. 234.

7. Davidoff, P., and Reiner, T. A Choice Theory of Planning. Jour. of American Institute of Planners, Vol. 38, May 1962, p. 110.
8. Mason, J. B., and Moore, C. T. Location Criteria and Communication Frameworks for Highway and School Planners and the Development of Criteria and Guides for Community Acceptance of Highway Location, Planning, and Development: Summary, Findings, and Conclusions. Bureau of Research and Development, Alabama Highway Department, Montgomery, Aug. 1970, 94 pp.
9. Mason, J. B., and Moore, C. T. Location Criteria and Communication Frameworks for Highway and School Planners and the Development of Criteria and Guides for Community Acceptance of Highway Locations, Planning, and Development: Theoretical and Methodological Frameworks. Bureau of Research and Development, Alabama Highway Department, Montgomery, Aug. 1970, 220 pp.