

A Survey of Citizens' Opinions of the Effectiveness, Needs, and Techniques of Urban Transportation Planning

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A home-interview technique was used to obtain information regarding citizens' opinions of the effectiveness, needs and techniques of urban transportation planning. Among the questions investigated are perceptions of the relative importance of investments in transportation as compared to other urban facilities and services, perceptions of the adequacy of consideration given to individual needs and desires in the planning process, opinions about the most urgent needs for improvement in transportation, and attitudes toward the relationship between transportation facilities and community health, safety, and aesthetics. Opinions are analyzed to reveal systematic relationships between the opinions expressed and the socioeconomic and travel characteristics of the respondents, and the implications of the results of this analysis are discussed.

●URBAN transportation planners have in recent years broadened their concepts of cost and benefit in the evaluation of alternative transportation plans and projects. Today more and more attention is being given to the possible positive and negative effects of transportation projects on the total urban environment. Evaluations which consider only the economic benefits to users and the economic costs to users and government are increasingly criticized as being insufficient. Clearly, plans and policies which take account of a wide range of environmental consequences concomitant to the provision of transportation facilities, as well as their transportation service consequences, will not necessarily coincide with those which consider the transportation consequences alone.

While the methodology for the quantification of user benefits and highway costs may be criticized for its failure to correspond to the benefits and costs as perceived or experienced by the user, the environmental influences of transportation projects have been even more difficult to evaluate because they are as yet difficult to quantify at all. Although these environmental consequences may best be treated subjectively rather than quantitatively through indices and rating schemes, it is probably the difficulty of measurement and quantification which has led to inadequate consideration of them in transportation planning.

This research is based on the contention that the transportation planner has the responsibility to delve into the difficult problems of identifying and measuring the relationships between the transportation system and its concomitant effects on the urban population and environment. A home-interview technique was employed to elicit the respondent's perceptions of the relative importance of investment in the transportation system compared to other urban facilities and services which influence the quality of urban life.

Questions were asked to determine whether or not the citizen felt that his needs and desires were adequately considered in the political decision-making process which results in the allocation of resources to transportation facilities and to other facilities vital to the economic and physical health of the community. The citizen's impressions of the more urgent needs for improvement of transportation facilities were sought, along with his impressions of how such facilities affect the health and safety of the residents of the community. Opinions were also analyzed to determine what, to the respondent, would be the ideal criteria for locating and building transportation facilities in order to minimize disruption of neighborhoods and hazards to health and safety, while maximizing the perceived value of the transportation system as a whole.

Responses to these questions were statistically treated to determine if any systematic variations exist which are related to the socioeconomic and demographic characteristics of the respondents or their travel habits. The presence of such systematic variations would imply that the attitudes of citizens toward the issues examined are stable and possibly predictable, and hence that such opinions may be employed as a useful tool in planning and evaluation.

HOME-INTERVIEW PROCEDURE

To facilitate the quantitative analysis of the data, constrained-response type questions were used for the collection of most of the information in the home-interview procedure (4). Constrained-response questions often reflect the views and attitudes of the person constructing the interview form, and thus tend to introduce bias into the results obtained. In order to minimize such bias, about 20 test interviews were conducted. These consisted of open-ended questions, and the constrained-response questions were constructed only after a careful study was made of the answers to these open-ended questions. Every effort was made to word the questions in a neutral manner, and to incorporate the points raised by the respondents in the open-ended pilot interviews.

In addition, some redundancy was introduced into the final questionnaire form by including both open-ended and constrained-response questions on several issues. The comparison of the responses to the two types of questions enabled the author to know how the respondents interpreted some of the key words used in the constrained-response questions.

A sample of several hundred potential subjects was drawn at random from the city directory of Evanston, Ill. Prospective subjects were first mailed a letter which explained the purposes of the research and the nature of the interview. About one week after the mailing of the letter, telephone calls were made to the prospective subjects in order to make an appointment for the interview. About 20 percent of the people in the sample had moved, died, or had become impossible to reach since 1963. Of the people to whom letters were sent, 35 percent refused to cooperate. The remaining 45 percent agreed to participate and were interviewed. The refusal rate in the non-white neighborhoods of Evanston was approximately ten times the refusal rate in the white areas. In future studies of this type, it might prove desirable to employ members of particular ethnic groups to contact and interview members of their own groups. In addition, women refused to participate about twice as often as men. As a result, the sample is biased toward white males as compared with a truly random sample of the population of Evanston.

A total of 139 respondents were interviewed. Of these, 21 percent were women and 79 percent were men. The mean age of the respondents was 49 years, although they ranged in age from 19 to 78 years. Household sizes varied from 1 to 8 persons, with a mean value of 3 persons per household. The average level of education among the subjects was 14.7 years, with the lowest level being 6, and the highest 20 years. Twelve percent of the people were engaged in blue collar occupations, 72 percent were in white collar but nonprofessional positions, and 16 percent were professionals. The sample had a mean family income of approximately \$14,800 per year, and 65 percent of the respondents owned their own homes. Only 35 percent rented houses or apartments. About 85 percent had moved to their present homes from others in the Chicago Metropolitan Area; 15 percent had come from outside the metropolitan area. The

average family had lived at its present address for a little more than 9 years. Only 35 percent of the sample, however, was born in the Chicago Metropolitan Area. Approximately 43 percent worked in the CBD of Chicago, and the respondents had an average trip to work of 28 minutes, covering 9.7 miles.

This brief profile of the sample indicates that the responses measured are those of the citizens of a stable upper-middle class commuter suburb, with a lower proportion of homeowners than most typical commuter suburbs. The members of the community are relatively well educated.

The characteristics of the respondents should be borne in mind by the reader, because the measurements made and the relationships found can be assumed to be valid only over the ranges of the variables actually observed in the sample. The limited size of the sample, and its particular characteristics emphasize that the nature of the investigation is that of a pilot study, useful nonetheless for the testing of the methods of analysis and for the formulation of hypotheses regarding the interactions between the opinions and personal characteristics measured.

PERCEIVED RETURNS FROM INVESTMENTS IN TRANSPORTATION AND OTHER PUBLIC PROJECTS

To begin the analysis of the perceptions of the transportation system as an environmental component, estimates were made of how the respondents viewed the quality and value of the transportation system in comparison to the quality and value of several other major urban services. This was done in two ways. In one question the respondents simply rated the quality of the various urban services on a scale of 0 (very poor) to 4 (very good). In another question they were each asked to allocate \$100 among several types of improvements to the public facilities of the metropolitan area in any proportions which they saw fit. This question required the respondents to consider two effects operating simultaneously. First, they had to rate the quality of the facility. Second, they had to estimate the relative payoff to be gained from an investment in that type of facility, in terms of the improvement of the urban environment, as opposed to the payoff of an investment in other facilities or services. Thus, a large allocation to a particular form of public investment might indicate that the respondent feels that the service or facility is of poor quality and needs much improvement. It could also indicate that a particular service or facility which is perceived as being of high quality yields a high level of satisfaction, and is thus seen as being worthy of a larger allocation.

Tables 1 and 2 summarize the responses to the two questions. It is apparent, for example, that although the quality of education provided in the area is considered reasonably high, the perceived payoff to be received from investment in the improvement of education is relatively high. This may be deduced from the fact that education received the highest mean monetary allocation although it received a mean quality rating which was equal to the median of the quality ratings for the facilities and environmental factors rated. Similarly, although the transportation system (both highway and transit) received quality ratings

TABLE 1
MEAN RATINGS OF QUALITY OF
PUBLIC FACILITIES IN THE
CHICAGO AREA

No.	Quality	Rating
1.	Water for drinking and recreation	3.13
2.	Police and fire protection	3.10
3.	Health and hospital facilities	3.01
4.	Parks and recreation facilities	2.95
5.	Education	2.72
6.	Highway system	2.72
7.	Mass transit system	2.59
8.	Public welfare programs	2.50
9.	Urban renewal program	2.36
10.	Air	2.04

Scale: 0 = very poor; 4 = very good.

TABLE 2
MEAN MONETARY ALLOCATIONS TO
PUBLIC IMPROVEMENTS

No.	Improvement	Allocation (\$)
1.	Education	20.47
2.	Transportation	12.73
3.	Urban renewal and slum clearance	12.08
4.	Air	9.58
5.	Police protection	9.52
6.	Water	8.80
7.	Public health programs and hospitals	8.25
8.	Parks and recreation facilities	7.04
9.	Public welfare programs	5.41
10.	Fire protection	4.72
11.	Other (specified)	1.40
		100.00

TABLE 3
SUMMARY OF SOCIO-ECONOMIC AND DEMOGRAPHIC VARIABLES
MEASURED FOR EACH RESPONDENT

No.	Variable
1.	Respondent's sex (male; female)
2.	Respondent's age (years)
3.	Respondent's race (white; non-white)
4.	Size of respondent's household (people)
5.	Respondent's occupation (blue collar; white collar nonprofessional; professional)
6.	Education of respondent (years)
7.	Number of drivers in respondent's household
8.	Time respondent lived at present address (years)
9.	Time respondent lived at previous address (years)
10.	Previous address location (in Chicago metro. area; outside Chicago metro. area)
11.	Place of birth of respondent (in Chicago metro. area; outside of Chicago metro. area)
12.	Home ownership status (own; rent)
13.	Respondent's time on present job (years)
14.	Respondent's family income (thousands/year)
15.	Respondent's family car ownership
16.	Type of residence (one-family; two-family; apartment)
17.	Number of miles driven by respondent in previous year (thousands)
18.	Stage in family life cycle (six categories based on age, marital status, and number of children)
19.	Proportion of trips to work made by modes other than driving
20.	Length of trip to work (miles)
21.	Distance from residence to nearest freeway (miles)

approximately equal to the median rating, transportation system improvement obtained the second-highest average monetary allocation. Thus, we may conclude that although the quality of the transportation system is not perceived to be particularly poor, the respondents still feel the advantages to be gained by transportation improvements merit the required monetary inputs. In contrast, although the quality of air in the region was considered quite low compared with the quality of the transportation system, the respondents gave improvement of air through reduction of pollution a mean monetary allocation which was a good deal smaller than the allocation to transportation improvements. Apparently, they felt that a dollar could not buy enough improvement in air quality to warrant a

higher expenditure on it, or that improved air quality did not improve their satisfaction with the environment as much as did transportation facility improvements.

The χ^2 contingency test for two independent samples (3) was used to determine whether monetary allocations and environmental quality ratings were related to the socio-economic variables listed in Table 3. Since the ratings and allocations for the transportation variables are of most concern, the relationships found for these variables only will be cited here. The variables found to influence the allocations to transportation significantly (at the 95 percent level) were the sex of the respondent, the number of miles he had driven last year, the frequency with which he used modes other than driving, and the number of cars he owned. Men allocated more money than women to transportation improvements, with 56 percent of the women and 30 percent of the men allocating less than \$5, and 21 percent of the men and 11 percent of the women allocating more than \$20. Those who drove fewer miles last year (and women tended to drive less than men, so this finding is not wholly independent of the previous one) allocated less money to transportation than those who drove more. Of those who drove less than 5,000 miles last year, 83 percent allocated less than \$10 to transportation improvements, and 17 percent allocated more than \$10; of those who drove more than 15,000 miles last year, only 67 percent allocated less than \$10 to transportation while 33 percent allotted more. Frequent users of modes of travel other than driving for the trip to work stated that they would spend significantly more on transportation than infrequent travelers by other modes, and people who own two or more cars would spend more than those who own none or one. Sixty-nine percent of the zero and one car respondents allocated less than \$10 to transportation projects, but only 56 percent of the two or more car owners allocated less than \$10. The analysis showed this difference to be statistically significant.

It can be concluded that, for the sample interviewed, people who travel more are likely to perceive a greater payoff from transportation investments than those who travel less, and that those who spend more on privately owned transportation (as indicated by high car ownership) are likely to feel that large benefits are to be gained from public investment in transportation as compared with other public facilities. Transportation investments as a whole appeared to yield the greatest returns to the respondents of any public investment except education.

In large part, the answers to the previous questions are evaluations of how well certain problems regarding the urban environment have been solved. It would be interesting to extend this research by repeating these questions over time to determine whether responses to them may be invariant or whether they may change with variations in the environment. It would also be interesting, if possible, to relate these statements of projected behavior to observed decisions of the citizens, and

thus to evaluate the validity of the questioning procedure. These questions pertain to many of the following issues, as well as to those just discussed.

TABLE 4
MEAN MONETARY ALLOCATIONS TO
TRANSPORTATION IMPROVEMENTS

No.	Improvement	Allocation (\$)
1.	Build additional new rapid transit lines	22.20
2.	Improve maintenance on existing highways	14.08
3.	Modernize existing rapid transit facilities	12.15
4.	Build additional downtown parking facilities	10.19
5.	Build additional new highways	10.02
6.	Add safety features to existing streets and highways	9.33
7.	Reduce traffic congestion by adding signals and signs to existing street and highway system	8.48
8.	Improve traffic law enforcement	6.60
9.	Beautify highways and rapid transit facilities	4.12
10.	Other (specified)	2.83
		100.00

PERCEIVED RETURNS FROM INVESTMENTS IN ALTERNATIVE TRANSPORTATION IMPROVEMENTS

In addition to estimating how the respondents viewed the returns from investments in transportation projects as opposed to other public facilities and environmental characteristics, a further effort was made to isolate their perceptions of the relative returns to be gained from investments in various types of transportation improvements. This was done, again, by asking each respondent to allocate \$100 among the several types of transportation improvements which were cited most frequently in the pilot interviews. The mean allocations among all the respondents are given in Table 4.

The results indicate extremely high mean allocations given to the two rapid transit variables. The largest mean allocation was for the building of new rapid transit lines in the Chicago Metropolitan Area, and the third highest allocation was for the modernization of existing rapid-transit facilities. Apparently, the respondents (most of whom drive to work quite regularly) feel that public investment in high quality mass transit will produce benefits to them which warrant these high allocations. The χ^2 contingency tests show that the sex of the respondent exerts a significant effect (at the 95 percent level) on his allocation to the building of additional new rapid transit lines. Women were found to make either very large or very small allocations to this variable; whereas men made less extreme allocations. Blue collar workers made significantly lower allocations to both the building of new transit and the modernization of existing transit facilities than did white collar workers and professionals. This finding is consistent with the additional result that allocations to the transit variables are significantly positively related to years of education. As the length of the respondent's work trip increased, his allocation to the building of new rapid transit facilities increased, but work trip length had no significant effect on allocations to the modernization of existing transit facilities. As the respondent's frequency of using modes of travel other than driving increased, his allocations to transit modernization increased, but the frequency of using other modes had no effect upon allocations to the construction of new transit facilities. Those born in the Chicago Metropolitan Area assigned significantly larger amounts of money to the transit variables than those from elsewhere. We may hypothesize that increasing benefits from rapid-transit investment are perceived by those who are more highly educated, by those who would have more opportunity to use transit facilities (e.g., those with longer work trips), and by those more oriented to urban styles of living (e.g., those born in the metropolitan area). In addition, the indication that those presently using transit most often would spend more on modernization of the facilities but not on building new facilities, may indicate that their destinations are likely to be served well by existing routes, and that new construction is not needed to fill their needs.

TABLE 5
PERCENT OF RESPONDENTS SELECTING EACH TYPE OF
TRANSPORTATION SERVICE AS ONE OF
THREE MOST URGENTLY NEEDED

No.	Service	Percent
1.	Additional crosstown routes	72
2.	Mass transit to downtown	68
3.	Parking downtown	49
4.	Bypass routes around city	31
5.	Freeways to downtown	30
6.	Better connections to airports	16
7.	Other ^a	14
8.	Better routes to recreation areas and open space	8
9.	Better highways to other cities	6
10.	More scenic parkways	5

^aThe other improvements most frequently cited were parking lots at outlying shopping areas and street and alley lighting.

Table 4 also indicates an extremely low importance assigned to the beautification of transportation facilities, which is interesting in light of the recent publicity on the subject from the White House. Women assigned more money to beautification than men, homeowners allotted more than renters, and those who drove to work less often than they took other modes allocated more to this variable than those driving more frequently.

It may be concluded that perception of benefits to be received from an investment in a

particular type of transportation facility were related to the respondent's potential for use of that type of facility. Allocations to the construction of new highways were found to be higher among multiple car owners than among respondents from no and one-car households, and were also much lower among people most frequently using other modes than driving. Money allocated to the construction of new highways was also significant, positively related to the distance driven by the respondents in their work trips.

The people interviewed were also asked what types of transportation services they felt were most urgently needed. They were told to select three from the list of nine which resulted from an open-ended question on this subject asked of the subjects in the pilot interviews. They also could specify services not on this list. Table 5 gives what percentage of the total sample cited each type of transportation service.

Nearly three-fourths of the respondents cited a need for additional crosstown routes. The interviews were administered at a time when public controversy was raging over the location of the proposed Cicero Expressway, a major crosstown route. This may help to explain the importance attached to the need for crosstown routes. In addition, mass transit to downtown was cited by 68 percent of the respondents. Nearly half saw downtown parking as being among the three most urgently needed transportation improvements.

Discriminant analyses (1, 2) were performed to determine whether or not respondents citing a given need differed significantly from those not citing it. Those seeing a need for mass transit to downtown differed only in that they were significantly more highly educated. Perception of a need for more crosstown routes was found to be associated with frequent use of other modes than driving in the work trip and high mileage driven last year. Younger respondents were also more likely to perceive this need than older ones. Those perceiving a need for more downtown parking were people who drove to work more often and might make greater use of downtown parking facilities.

Very few respondents saw needs for better routes to recreational areas and open space, or for better highways to other cities. Apparently the Interstate Highway System has served to improve intercity travel and weekend or vacation trips for recreation. Also, very few respondents perceived a need for more scenic parkways. This seems to be consistent with the low ratings assigned to beautification. Those who did cite a need for better routes to recreational areas and open space had a mean age of 58 years; those who did not averaged 49 years of age. These two groups did not differ significantly in any other variables. Those who saw a need for more scenic parkways were younger and at earlier stages in the family life cycle than those who did not perceive such a need.

RESPONDENT IMPRESSIONS OF THE EFFECTS OF NEARBY FREEWAYS ON RESIDENTIAL NEIGHBORHOODS

A group of questions was included to determine what effects the respondents felt a freeway built through their neighborhood might have on their property and on health and safety. Would they find the freeway to be of "negative benefit" or not? Would they regard the freeway as a source of noise and fumes and as a hazard to the safety of their children or not? The questions dealt primarily with a freeway which might be built within five blocks of the respondent's home, but did not deal with his home's being taken as part of the right-of-way.

When asked if they would like to live closer to a freeway than they are presently living, 80 percent of the respondents said no, 15 percent said yes, and 5 percent did not know. Interestingly, their present distance from the nearest freeway did not enter as a significant variable when discriminant analysis was used to find the dimensions which differentiated between those saying yes and those saying no. Those who said they would not like to live nearer to a freeway had held their present jobs for a mean period of 17 years, and had lived at their present addresses for an average of 11 years, whereas those who would have liked to have lived closer to a freeway had held their present jobs for an average of eight years, and had lived at their present addresses for about seven years. Those who did not wish to live closer to a freeway were significantly more highly educated than those who did, and had a larger number of drivers in their households.

In spite of the fact that 80 percent of the sample surveyed did not want to live closer to a freeway, it was found that 73 percent said they would not move away if a freeway were to be built within five blocks of their homes; 14 percent said they would move; and 13 percent did not know whether or not they would move. Among those who said they would move, there was a significantly higher proportion of homeowners than among those who said they would not. The group which said it would move had a significantly higher mean annual income than the group which said it would not move; and those who would move were also more highly educated than those who would not.

The results of the above two questions indicate that although very few respondents wanted to live closer to a freeway, very few would move if one were built very close to their homes. Apparently the perceived advantages of a particular house and general location outweigh the immediate benefits and "disbenefits" of a nearby freeway, particularly if one has lived there for a long time. Those who would move if a freeway were built appear to be those with a greater investment in their homes (owners) rather than those without as large an investment and those who could move more easily (renters). We may hypothesize that property owners, particularly those with higher levels of income and education, are more sensitive and less favorable to the presence of freeways in their immediate neighborhoods.

When asked how they felt a freeway within five blocks of their homes would affect property values in their neighborhoods, 17 percent said property values would rise, 46 percent said they would fall, 26 percent felt the freeway would have no effect, and 11 percent did not know what the effect would be. Once again, those less favorable toward freeways—those who felt that property values would fall—were distinguishable by the fact that they had higher incomes and higher educational levels. They also tended to be farther along in the life cycle than others. This finding is consistent with the previously formulated hypothesis.

Looking at freeways as a safety hazard to children, 60 percent of the respondents said that a freeway in their neighborhood would not be dangerous to children, 33 percent said that it would be, and 7 percent did not know. Those who saw the freeway to be a safety hazard had lived at their present addresses for a mean period of nearly 16 years; those who did not consider the freeway dangerous had resided at their present addresses for a mean period of 8 years. Those who considered the freeway dangerous to children were also more highly educated than the others in the sample, and were more likely to be in white collar or professional jobs than the others.

In response to a question about whether or not the respondents felt a freeway within five blocks of their homes would make their neighborhoods more noisy, 68 percent said yes, 26 percent said no, and 6 percent said they did not know. Those who felt that the freeway would make their neighborhoods noisier again tended to live at their present addresses for a longer period of time, and to have higher levels of education than those who said it would not. They were also less likely to have been born in the Chicago Metropolitan Area, and were at earlier stages in the life cycle than those who felt the freeway would make their neighborhoods noisy.

Half of the respondents felt that a freeway within five blocks of their residences would not make their communities unsightly or unattractive, while one-third of the sample stated that such a freeway would make their neighborhoods unsightly. The remaining 17 percent of the respondents expressed no opinion on this question. Once again, the respondents who felt that a highway would make their communities unsightly could be discriminated from the others by their high levels of education and longer times of residence at their present addresses. Those who felt that the freeway would be unsightly also had lower mean car ownership and tended more toward white collar and professional jobs than the other respondents. Half of the respondents did feel that a nearby freeway would tend to make their neighborhoods dirty and smelly, with 38 percent feeling that dirt and odors would not result, and 12 percent not responding. Those who stated that the freeway would make their neighborhoods dirty or smelly were more likely to be homeowners than those who did not, had lived at their present addresses an average of nearly 5 years longer than those who did not, and tended to be in later stages of the life cycle.

Finally, when asked if they felt that a nearby freeway would make their neighborhoods more or less convenient, 61 percent of the sample responded by saying more convenient; 8 percent said less convenient; 23 percent saw no change in convenience resulting from the construction of a freeway; 8 percent did not reply. Those who said that the freeway would be less convenient could be differentiated from the others in that they lived at their present addresses for an average period of more than 16 years; those who saw the freeway as making their neighborhood more convenient had a mean tenure of residence of about 9 years. This was the only variable which was found to be a statistically significant discriminator between the groups at the 95 percent level.

The results of these questions exhibit a clear trend among the respondents. Those who were most likely to perceive a nearby freeway as a source of "negative benefits" were, to a large extent, those with deeper roots in their neighborhoods. They were more likely to be the homeowners rather than the renters, and those who had lived at their present addresses for longer periods of time. They also tended to be people of higher levels of education, and not independently, they were more likely to be in the professions or white collar positions, while those who responded more favorably about freeways near their homes were more likely to be of the lower socioeconomic strata.

RESPONDENTS' PERCEPTIONS OF THE ADEQUACY OF THE PLANNING PROCESS, PARTICIPATION, AND RATINGS SUGGESTIONS FOR FREEWAY LOCATION CRITERIA

In previous sections the focus of this study has been on the citizens' impressions of the values, limitations, and environmental influences of transportation system characteristics. Little attention was given to their impressions of the process of system planning; rather they were asked to respond to statements which treated the characteristics of the transport system as accomplished facts. In this section, however, the respondents' views of the adequacy of the current planning process are examined, and the degree to which they have participated in the planning process will be measured. In addition, respondents' ratings of several alternative methods of making planning decisions will be presented, and the influences on these ratings of personal characteristics will be sought. Finally, their preferences among alternative generalized criteria for freeway location decisions will be examined, and these too will be analyzed to determine the influences of personal characteristics on such preferences.

When asked whether they felt that their interests and needs, and those of their friends and neighbors, are adequately considered in the provision of transportation facilities in

the Chicago area, 55 percent of the respondents said that such needs were not adequately considered, and 45 percent said that they were. When asked to state the reasons for their answers to the above question, the respondents did not speak about the planning process at all, but referred to the specific characteristics of the system which affected them directly. Those who felt that their needs were met often said, "I make good time in my trip to work," and those who said that their needs were not met often cited specific sources of irritation, e. g., "The Dan Ryan Expressway is a monstrosity." Careful statistical analysis, using both univariate and multivariate methods, failed to show any significant differences between the personal characteristics and travel habits of the group saying its needs were met and the group stating that its needs were not. It appears that only satisfaction or dissatisfaction with specific facilities differentiates between the two groups.

In answer to the question: "The way transportation facilities are presently planned and built, what do you think you can do to help see that your needs are best satisfied?" nearly 70 percent of the people interviewed responded by simply saying that there was nothing, or very little, that they could do. About 15 percent said that they could write letters to newspapers or elected officials, and about 5 percent said they could organize committees and try to sway public opinion or that they could confront public officials.

When asked whether or not they had ever attended public hearings to express their views about planned or proposed transportation projects, 88 percent of those interviewed said that they had not, and only 12 percent said that they had. Nearly every person who had attended a public hearing would have in some way been affected by the project which was to be discussed at that meeting. They usually attended because they feared loss of their property to make way for a freeway right-of-way. Once again, the only evidence, in this context, of concern with or involvement in the planning process resulted from personal dissatisfaction with specific projects rather than concern about planning as a process or about goals for the community. Once again, no socioeconomic or travel characteristics differentiated the groups. More than half of the respondents (53 percent) said that they would not take a more active part in public hearings if they were better publicized by the mass media, and only 28 percent said that they would. The remaining 19 percent did not know whether or not they would take a more active part under those conditions.

The picture gained thus far of the respondents' views of the transportation planning process is one of general disinterest except in the cases where individuals were inconvenienced by specific projects or facilities. If they arrived at their destinations quickly, the respondents were generally satisfied with the results of the planning process. When their own property was not endangered, most respondents took little interest or part in that process, and would continue to take a small part even if they were made more aware of the issues. Most respondents felt that there was little that they could do to influence decisions which resulted in transportation plans.

An attempt was made to determine what, to the respondents, would be the best method for making decisions about where, when, and how to build transportation facilities. To accomplish this, they were instructed to rate six suggestions for decision-making methodologies on a scale which ranged from 0 (very bad) to 4 (very good). The results are summarized in Table 6, where the mean ratings found for each method are presented in descending order.

It is interesting to note that the suggestions for decision processes which received the highest mean ratings were the methods which would give the planners much stronger powers than they presently possess. The method which would leave the decisions to the planners, but require them to consult with a group of leading citizens throughout the planning process, received the highest mean score. The method which would simply leave the decisions completely to a staff of trained professionals received the second highest mean rating. Leaving the planning decisions completely to the elected officials received the lowest mean score, and the suggestion to let the citizens decide, by referendum, about the location and nature of transportation projects received the second-lowest score. Clearly, the respondents interviewed felt that trained professional planners were most highly qualified to make such decisions, and they did not feel that

TABLE 6
MEAN RATINGS ASSIGNED TO ALTERNATIVE METHODS FOR
MAKING TRANSPORTATION PLANNING DECISIONS

No.	Method	Mean Rating
1.	Leave the decisions to the planners, but have them work closely with a leading group of citizens before, during, and after the time when the decisions are made.	3.08
2.	Leave the decisions as to where, when, and how to build highways to a trained staff of professional engineers and planners.	3.01
3.	Elect a formal review board of citizens with the sole job of hearing the planners' proposals and deciding which is the best for the city as a whole.	2.29
4.	Let the planners put forth their concepts of the best plans at a public hearing at which anyone may object. After hearing all objections, let the elected officials decide which plan to adopt.	2.21
5.	Put the various alternatives proposed by the planners on the ballot at election time, and let the majority vote decide which plan to adopt.	1.63
6.	Give our elected officials complete power to decide which of the planners' proposals should be accepted.	0.99

elected officials were nearly as competent to make these choices. The low score obtained by the method which would give the decision power to the citizens may reflect a low estimation of the ability of the average person to make planning choices, or it may reflect the general disinterest in the planning process found above among the respondents. The decision-making methodology which bore the closest resemblance to current procedures received the fourth-highest rating among the alternatives.

The planning method which would leave the decisions entirely in the hands of the planners was found to be significantly more popular among apartment dwellers than among homeowners, and more popu-

lar among white than among non-white respondents. The alternative which would place the planning questions on the ballot for decision by referendum was found to be significantly more popular among homeowners than among renters. Once again, we may conclude that homeowners, with a greater investment in their community, are more concerned about exerting an influence upon the impacts of planning than are the tenants, who may move more easily, and who do not have as great an investment in their homes. The respondents with the highest levels of education and income were found to favor the alternative which would have an elected review board of citizens with the job of hearing the planners' proposals and deciding what would be best for the city as a whole. This group also tended to give a low rating to the alternative which would give all of the decision-making power to elected officials.

To complete this section, an examination will now be made of the respondents' rankings of broad and generalized criteria which could be applied to problems in the selection of rights-of-way for new freeways. Since all eight of the criteria considered could be viewed as desirable, but the satisfaction of all of them would be impossible, the respondents were asked to rank the criteria in the order of importance which they would attach to each. The criteria and their mean rankings are given in Table 7, arranged in the order of their mean rankings.

The most salient result of the rankings of freeway location criteria is that the criterion which have the freeway built where it would provide drivers with the quickest routes to their destinations received the highest ranking. Transportation planners are often criticized for planning and building routes which meet standards of transportation efficiency but which neglect the disruptive social and environmental effects of highways upon the community. Here we find, at least, that the citizens also place transportation efficiency at the top of the list of criteria, although this does not mean that they have given other criteria no consideration at all. After the criterion of getting drivers to their destinations most quickly, the second highest rating was given to the location of freeways so that they would not require the destruction of homes in healthy residential areas. Although χ^2 contingency tests of the first criterion showed no significant relationships with any of the socioeconomic or travel characteristics, the second was found to receive higher rankings among renters than among homeowners, and higher ratings among people of low educational levels than among those of higher levels. This finding

is in direct contrast with some of the previous findings, in which it appeared that property owners had a stronger interest in their immediate residential community than did renters.

The third-highest mean ranking was given to the objective of locating freeways where they would not go through parks and recreational areas. This criterion received higher rankings among older people than among younger ones, and was less important to multiple car owners than to zero or one car owners. Presumably multiple car families have easier access to wide ranges of recreational areas, and do not place a premium on a particular one which might be taken for a freeway.

Homeowners gave significantly higher ratings than did renters to the placement of freeways where construction costs would be lowest. Perhaps homeowners are more conscious of tax rates than renters, in spite of the fact that transportation improvements are normally financed largely through user taxes rather than through property taxes. Placing the freeway where it would avoid the dislocation of business and industry received higher rankings among the most highly educated respondents than among others.

Once again the suggestions for freeway location which involved providing pleasant scenery for the driver and harmony with surrounding scenery received the lowest rankings. This is consistent with the repeated findings that the respondents attach low levels of importance to scenic and aesthetic considerations. It was found, however, that with increasing annual mileage driven by the respondent, pleasant views and varied scenery increased in importance.

TABLE 7
MEAN RANKINGS OF FREEWAY LOCATION CRITERIA IN ORDER
OF AVERAGE RANKING

No.	Criterion	Mean Ranking
1.	Try to build the freeway where it will provide drivers with the quickest routes to their destinations.	3.22
2.	Try to put the freeway where it will not require the destruction of homes in healthy residential neighborhoods.	3.53
3.	Try to put the freeway where it will not go through parks and recreation areas.	3.93
4.	Try to put the freeway in such places that the construction cost will be the lowest.	4.07
5.	Try to build the freeway where it will avoid the dislocation of business and industry.	4.12
6.	Try to put the freeway through the slums and therefore aid urban renewal.	4.80
7.	Try to build the freeway where it will fit in best with surrounding scenery, even if this route is not the most direct.	5.87
8.	Try to build the freeway where it will provide pleasant views and varied scenery to the driver.	6.27

CONCLUSION

Opinion surveys can be a useful tool for "market research" in transportation planning. They constitute one of the few ways, and certainly one of the least expensive ways, in which planners may learn something of the impact of their nebulous products on the satisfactions and attitudes of the users and the nonusers in the community. If the opinions gathered in such studies bear statistically significant and interpretable relationships with the socioeconomic and travel characteristics of the respondents, such studies become something more than an academic exercise in that they help the planner mold the complex systems with which he works to the stated needs of the populace. Surveys of this nature can also be useful in pointing in advance to particular aspects of the planning program which might later be controversial, and may thus help the planner to avoid, or at least to prepare for, the public opposition which often follows the publication of transportation plans. The results of this survey reveal both enlightening and somewhat disappointing aspects of the nature of public opinion toward transportation planning.

It was found that attitudes toward transportation improvements and toward the planning process are reasonably consistent and can often be related to the characteristics of those expressing the opinions. The results indicate that the study of attitudes holds promise as a useful tool for use in goal formulation, in the development of planning

principles and standards, and in the establishment of the need for transport facilities in various areas. It was found that the respondents regard investment in transportation to be valuable, in spite of the fact that they perceive the quality of the transportation system to be high. They particularly feel that there is a need for further attention to questions of mass transit, but do not attach much importance to the beautification of transportation facilities.

The survey results may be somewhat disheartening to the idealistic planner who is interested in the effects of his projects upon the overall welfare of the community, since the citizens who participated expressed little interest in taking part in the planning process unless directly affected by proposed facilities or very irritated by existing deficiencies. Responses to questions about a freeway's effect on neighborhoods were found to be consistently related to home ownership status, level of education, and length of residence at present address. This finding might imply the possibility of predicting community reactions toward proposed projects on the basis of a few significant and easily determined variables.

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REFERENCES

1. Casetti, Emilio. Multiple Discriminant Functions, Tech. Rpt. No. 11, ONR Task No. 389-135, Contract NONR 1228(26), Office of Naval Research, Geography Branch, Evanston, Ill., Northwestern University, May 1964.
2. Cooley, William W., and Lohnes, Paul R. Multivariate Procedures for the Behavioral Sciences. John Wiley and Sons, p. 116-150, 1962.
3. Siegel, Sidney. Nonparametric Statistics for the Behavioral Sciences, McGraw-Hill, p. 104-111, 1956.
4. Wachs, Martin. Relationships Between Drivers' Attitudes Toward Alternate Routes and Driver and Route Characteristics. Highway Research Record 197, p. 70-87, 1967.
5. Wachs, Martin. Evaluation of Engineering Projects Using Perceptions of and Preferences for Project Characteristics. Unpublished PhD. dissertation, Northwestern University, 1967.