Socioeconomic Factors and the Highway Decision Process

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•THE PURPOSE of this paper is to stimulate discussion about the socioeconomic factors associated with decisions in highway location and design. Perhaps the best way to start is to list some of the factors that have been issues in many location and design decisions in California.

Recreational and park areas	Trade, wholesale, and retail
Historical and aesthetic values	Employment
Property values including impact on tax rolls	Area stability
Public and quasi-public facilities	Persons displaced
Total transportation plans	Population levels
Community master plans	Population composition
City street and county road traffic	Housing availability
Land uses	Open space
Noise levels	Parking availability
Air pollution levels	Intercommunity relationships

This list is by no means complete. Many of the factors must be divided further for proper consideration; for instance, land use should be divided into specific uses, such as residential and commercial.

Despite an increasing awareness that highways affect these factors, our ability to predict the effect or direction of change has actually reached only a low level of expertness. We can only crudely approximate the real relationship between the highway and the rest of the environment. Intensive interest in clarifying this relationship reaches back only a dozen years or so, and published results of studies still number in the few hundreds. To make matters more difficult, few of these studies formulate specific rules, because most were designed to shed light on particular problems at particular places. Therefore, we are and probably will be for a number of years in a trial-and-error period. Even so, highway decision-makers must deal daily with socioeconomic factors, basing their decisions on available information. This information must be organized and treated rationally in order to maintain public acceptance of the decision process.

It would seem rational to translate potential effect into monetary terms wherever it is possible to do so, and it is possible to do so with most of the factors. I am not at all sure, however, that such an exercise is always relevant to the decision process. Take the factor of land use, for example. If a route is located through a single-family residential area zoned for multiple use, an acceleration of the change to multiple use can be predicted. Demand can be estimated, a time for the conversion to multiple use can be figured and compared to existing trends, and then the discounted value of the change to the area can be calculated. But demand is not created by the presence of the highway; it is only focused and located from some place else in the region. If this is true, what is the value of the calculations?

It is important to the community involved to know that a more rapid conversion to multiple use can be expected because this affects tax base, school enrollments, and public services required. If the route or design is acceptable, the fact and possible timing of potential change is much more important than is the possible monetary value of such a change. And if the route or design is acceptable, there is, in my opinion, no reason to go further. There are situations, however, when a community asks to have a proposed route moved from the location of greatest net benefit to a location that would

encourage a land use change such as that just described. In a case of this kind it does seem proper to weigh the discounted increase in land values against the potential decrease in net benefit to the motorist by reason of the relocation.

Clearly, community desires must be taken into consideration, and the highway should be fitted to these desires if losses in motorists' benefits do not exceed gains to the community. There is inevitably some trade-off of gains necessary between motorists and community in order to permit achievement of the motorists' objective of improvements in highway facilities.

It would seem appropriate then to attempt to express socioeconomic effects in monetary terms only when the motorist is being asked by the community to incur higher costs or to enjoy fewer benefits than he would if the route or design were selected by means of a conventional highway engineering economy study. The comparison would seem to be properly made only between the increment of cost, or loss in benefits, and the gain to the community.

At the present time, there are several practical restraints to full consideration of all pertinent socioeconomic factors in nearly any route location situation. Expertise is limited, little applicable research has been done, and adequate financial support or personnel are just not available. These restraints require that consideration be limited to those factors that are likely to become key issues in the process. Currently a major problem is to identify these issues early enough in the process and to organize and prosecute a study effort that can assist with solution.

For this reason efforts are now being made to find bases for determining community attitudes and values. For instance, knowing whether a community will resist or seek change often makes possible the initial selecting of alternatives that will act as a buffer to, or will encourage, change in the community. In this way, potential controversial issues can be limited.

If it is not economically feasible to provide alternatives that will reinforce community values, then, at the least, study can be started on indicated key issues. Factual information adequately analyzed can often deter community leaders from adopting positions from which they may later be reluctant to retreat. Notification to the community that route location and socioeconomic studies will be started usually brings reaction that can indicate fruitful directions for study emphasis.

In the initial stages of route study, the community may indicate a concern, through its technical staff, its city council, its newspapers, or its legislative representatives, about its assessed value base or the potential for smog problems or the stability of uses in the corridor through which the route is proposed to be located. Often, at this point, minimal study of the key issue can influence community attitudes. Assessed value losses along several potential lines can be calculated, estimates of salvageable improvements can be made and offset against assessment losses, potential land use changes can be predicted, and value changes can be indicated also as offsets. Frequently, merely calculating assessed value losses and comparing them to average annual community increases can reduce fear of loss.

Similarly, past research findings can be interpolated in light of local conditions to provide general indications of effect for other socioeconomic factors. Certain factors reflect very direct relationships to the highway. Park areas or historical sites are either taken by the route location or they are not. The cost of avoiding them can be calculated as can the cost of replacing the park or relocating an historic building. For adjacent sites the cost of a wider right-of-way or extra landscaping may be pertinent. The value of parks or historic sites is irrelevant to the economy study process. If they have sufficient value to the community, the highway decision-maker will have a choice of building on an alternate route with fewer benefits or, if that is unacceptable, of not building at all. So the costs of the other alternatives are the items of importance.

Other factors of concern to the community may be important either because they lie within the right-of-way of a proposed route or because they are indirectly affected or because they are not affected. The number of persons displaced and the houses they occupy is obviously a matter of concern. The cost of the improvements is estimated as a matter of course as a part of the economy study process. Replacement housing for the persons displaced can become a major issue. Normally, it can be shown that,

given reasonable lead time for the acquisition process, vacancies occurring in the remainder of the community and new construction will fill the housing gap. More difficult replacement problems can usually be solved by stretching out the acquisition process, and the cost of this solution can be calculated in terms of user benefits deferred, if necessary.

A particular route location may be disputed because it will encourage conversion to undesirable land uses—undesirable, that is, to the adjacent residents or because potential uses do not fit the community's general plan. Conversion is usually to a more valuable use and gains can be estimated, although access restriction in rural areas can halt conversions to more valuable uses in which case losses can be estimated. Usually there are gains, however, and even though they may be significant, if they are not desired by the community, the value of the attitude or plan can only be expressed in terms of added costs or lower net benefits because of rerouting or redesign.

Similarly a community may wish a more expensive routing or special access provision to serve specialized land uses or to achieve a community objective such as reducing pressures for land conversion. Economic gains, if any, can be calculated but, and especially in the latter case, gain may not be apparent except in terms of satisfying a community desire. The loss in benefits to the motorist, in these instances, must be subjectively weighed. Certainly protracted negotiations for location will cause deferment of user benefits, and this should be considered as part of the economy process.

Although a number of approaches to dealing with socioeconomic factors have been suggested in this presentation, the concepts are still generally in the process of development. In the past several years much experimentation has been done by the California Division of Highways and by private research consultants in California. The consultants have generally taken the approach of assigning subjective weights or rankings to factors that must be considered in the route location process. In one approach, for example, 30 factors were listed including the normal components of a highway engineering economy study and those socioeconomic factors considered by the consultant to be important. Each factor was assigned a weight of 1 to 5. Construction cost was weighted 2, and aesthetics, 4. Each route alternative was then ranked on the basis of an evaluation of its comparative relationships to the factor under consideration. The highest construction cost was ranked 1 and the lowest, among 4 alternatives, was ranked 4. Weight times rank produced a point score, and the highest score theoretically indicated the best route.

It is difficult to agree with either the subjective evaluation approach or with the assignment-of-points approach that currently seems to be in vogue. The weak points of subjective evaluation do not need to be amplified. Assignment of points tends to obscure the vital significance of many of the elements whose importance can only be realized when the expression is in terms of dollars or when strong narration and documented research indicate the alternatives and consequences.

It has been said that highways are one of the few permanent features of the landscape and that other man-made features will probably change several times during the life of the highway. Certainly with our increasing proclivity to encourage obsolescence we may find that this is an accurate statement. If it is true that a highway serves as a relatively unchanging framework for other activities, its location and design are of the highest importance. And if, in fact, other factors of concern are, by comparison, more temporary in nature, the thesis should hold that basic effects should be measured in terms of lower or deferred net benefits to the motorist as a result of avoiding or achieving effect.

This then is the viewpoint that, it is hoped, will stimulate some discussion. It is briefly summarized as follows:

1. Basic community attitudes toward change must be identified as early in the route location process as is possible.
2. It is not practical, and may not be necessary, to identify, study, and measure every potential socioeconomic effect or community value but only those key issues that may cause adjustment in location or design of the best choice selected on a rational basis.

3. Subjective evaluations of the relative importance of socioeconomic factors and point-grading systems are nearly valueless and may be inimical to rational decision.

4. It is not proper to weigh socioeconomic factors in highway engineering economy studies. Socioeconomic costs or gains should be identified and, if possible, quantified in money terms or fully evaluated and described as to potential effect only when necessary to aid in a decision to accept lower net benefits.

5. The decrease in, or deferment of, net benefits by reason of community-requested location or design adjustment must be carefully calculated. Trade-off of gains by both the motorist and the community should be expected.

This viewpoint begs at least one major issue: Should not highways be located to achieve the greatest net gain? The question—gain to whom, the community, region, state, or nation?—is impossible to answer in today's environment; therefore, this issue remains.

Dealing with socioeconomic factors by using a problem-solving approach can be like standing too close to the forest. Important, long-range aspects of the larger problem may be overlooked. It is hoped that this does not occur. Continuous research into what appear to be important aspects of highway impact is conducted as a matter of course. The relationships between community attitudes, economic conditions, and observed change are a matter of great concern as is also the place of the highway in the change pattern.

At this point in the development of our experience, extreme care must be taken that we do not move too rapidly away from the side of sound economics. Careful and individual attention must be given to socioeconomic factors of importance to the community, but caution must be observed in formulating general rules. For this reason standardization of procedures should await the future developments that will increase our information base. Meanwhile, the highway decision process is being improved as this base grows.

Discussion

Marvin Manheim

It sounds as though you have a very effective process of comparative analysis among and within communities. This is certainly a very important thing to do. Have you been able to go back and see to what extent your predictions or anticipations were valid, and, if not, why you were wrong?

Bamford Frankland

No, to answer simply. One reason is that the consequences seldom follow quickly. However, one exception was our analysis for a single-family residential area in Glendale zoned for multiple-family residences. We predicted that, when the route adoptions were announced, existing land uses would be converted to higher uses. This happened exactly, and several years before actual construction. But for other kinds of consequences that take so long to materialize, an after-analysis is difficult.

Dan Haney

Would it be feasible to get a community to develop its own weighting scheme, one that could be used repeatedly in the community where more than one highway is going

to be put through it and one that could be used throughout the entire design process rather than just in the process of route selection?

Bamford Frankland

We place very little credence in opinion surveys. Let me give you an example. When we first started studying the economic effects of freeway bypasses, we asked the affected businessmen how the freeway had affected them. Some said that business was great, never better; others said that business was lousy. We produced a study on this basis. We also went to the State Board of Equalizations, where income and sales tax records are maintained, and checked on that community. We found that those who said business was great were doing poorly and those who said business was lousy were doing great. This illustrates one problem of opinion surveys.