# THE CONSULTANT'S PROBLEMS IN THE DESIGN AND CONSTRUCTION OF URBAN HIGHWAYS

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•THE LOCATION and design of an urban freeway are important to the present and future well-being and growth of the city and the people who are directly or indirectly affected. The design is also enormously more complicated for an urban freeway than for a rural freeway because of the location in a tightly developed urban setting where a single block can provide more dollars of income and house more people and enterprises than many square miles of rural land. The multidisciplinary design team is a response to this complexity. It brings together people who can consider the far-reaching effects of an urban freeway from a variety of professional disciplines and can then make design recommendations that take into full account the major social, economic, and aesthetic impacts that an urban freeway has on the environment.

The design team approach is being used on an increasing number of urban freeway projects. The multidiscipline design team may be an in-house group assembled by a government agency or it can be provided by an outside consultant. If a consultant is selected for a job, there are many means of operation. The multidiscipline team may be within one consulting organization, which we think is preferable if the necessary competence and range of disciplines can be provided. Alternatively, the team may be composed of a prime consultant plus subconsultants to handle portions of the work that the prime consultant is not qualified to handle. Or, as a third method, there is the joint venture, in which two or more consultants join together as contractual equals to make up the disciplines needed for the team.

The most important internal problem is the coordination and management of the diverse disciplines, and this is true regardless of how the design team is put together. Leadership is needed, and one person must head the team. We believe that an engineer who is experienced in urban highway planning and design and knowledgeable in highway construction and maintenance is generally the one best suited to lead the team. The head of the team must be a capable manager and a skilled administrator, must be able to relate to the various professions and disciplines, and must be able to relate the professions and disciplines to one another along an organized line of effort.

Relations with public agencies and with the public itself are most important; in fact, the most important problems confronting the design team have to do with dealing with the public. Early in the study, a decision must be made concerning methods of working with and securing the local citizens' concerns and opinions. Public hearings are, of course, required by federal law as well as by state policy in most instances, but public hearings are not enough. The public hearing is, in fact, a poor means of obtaining input from interested citizens' groups and individuals. People who are content with the way things are going do not normally attend public hearings. People who are dissatisfied do. As a result, hearings tend to become loud confrontations between advocates and antagonists, shedding more heat than light. The public hearings must be held, but supplementary procedures seem highly desirable.

One or more persons of the multidiscipline team should be skilled in disseminating accurate and understandable information to interested citizens through all means including the news media. Perhaps better citizen participation could be accomplished by opening a storefront office at a location that is as convenient as possible to the proposed

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project where a trained person or persons could dispense and receive information from the concerned public. Small neighborhood meetings should be held for the same purpose. This type of public information program properly carried out could in many instances make the legal public hearing a mere formality without shouting, protesting, name-calling, and ill will being present.

These considerations are important because it is necessary for the consultant that the need and the general location of the proposed freeway be supported by the local government. It has been the general experience that political support is not committed until very late in the design process when community reaction can be weighed. There have been instances when political objections or political leadership has changed during the course of the team study, and the design team has been required to start again from the beginning. It is most essential and desirable for the political leaders, including the city, county, and state agencies, city council, city engineer, city manager, and city mayor, to be involved in the project from its outset. They should be able to understand and support the project during all phases of its development.

Delays throughout the study are a critical problem because delays cost time and money. The consultant often experiences wasteful delays in obtaining data, such as traffic analysis variables and population data, from his client. Furthermore, the client and other reviewing and approving agencies are often agonizingly slow to review consultant progress and preliminary report drafts and to make decisions on location and geometric designs. An urban freeway can become associated with the goals and participation of many agencies. The project can complement or hinder other projects, such as housing, commercial structure, institutions, and industry, and the operation and maintenance of existing and proposed facilities. Some method of resolving the goals and program concerns of the various agencies is definitely needed.

The concept of joint development and joint use of rights-of-way is extremely important in the highway planning program, and it must involve the participation of local agencies that have a commitment to share in the cost of such programs and that do not encourage the local citizens to believe that all such projects will be financed with highway funds. All public agencies interested in urban planning and development that include transportation planning should realize that continuing, cooperative, and comprehensive planning is required in the Federal-Aid Highway Act and must be complied with in order to obtain federal aid. The state highway or transportation department should take the lead in urban transportation planning. They have the knowledge and the personnel to do the job.

One solution is to set up, parallel with the design team, an interdisciplinary review team representing all of the major urban development agencies and led by the top-level political leadership of the urban area. This team would be able to consider the urban freeway as a major influence on all aspects of urban development. It would also help to overcome the problem of specialized review by single-purpose agencies of a project that has to be considered from many points of view.

Two major social problems confront the consultant—an equitable, rapid, and fair settlement with persons or businesses being displaced and restoration of the area adjacent to the highway and the treatment of the highway itself in such a manner that those left on the fringes are not permanently damaged.

The first problem requires considerably improved procedures to obtain early route approvals in order to begin right-of-way acquisition. The long period in which a route is studied, considered, argued about, and finally approved and further delays before right-of-way acquisition actually begins are most inequitable to all concerned. The private developer, wishing to know the location of the freeway so that his capital can be expended in relation to it, cannot be given any positive answers. Private developers, in this case, are driven away because they cannot afford to sit back and wait for the entire process to unfold. Homeowners buying or selling a property the day or shortly before the day that the proposal is announced are left in doubt until the final project is approved.

An even more critical social and financial problem deals with the relocation of the people who must be moved into "safe, decent, and sanitary housing" that is at least equal to housing they now occupy. The relocation must be done before the Secretary

of Transportation will approve the construction of the project. If housing is not available, it must be constructed before project construction approval can be obtained. As yet, definite arrangements for building replacement housing are not in effect in many areas.

Delays in establishing the freeway location and design compound the consultant's problems, increase his costs, and may even result in changing some of the factors on which his decisions were based. The consultant's problem is this: How can this period of time be shortened?

The second social problem concerns the design of the freeway itself—elevation or depression, median widths, side slopes, landscape treatment, frontage roads, lighting and light standards, fencing, and other elements introduced by the freeway. A construction sequence with minimum disruption to local areas is also important, but these factors are often freely recognized by concerned agencies. The consultant's problem is one of recognizing the long-range social impact of various design features and endeavoring to obtain approval of these features and construction procedures that will minimize undesirable impact on the adjacent property.

It seems that we are living in a period of greater change than ever before. Perhaps we just imagine this, but it appears particularly true in the planning, location, and geometric design of urban freeways. Some of the new requirements that relate to ecology, environment, and other social amenities are not well understood and are therefore much more difficult to evaluate than the length of the project and its construction and operation cost. This causes the consultant a problem in getting sufficient funding in his fee to adequately study and evaluate these comparatively new factors. A complete analysis by the multidiscipline team of alternate route locations must be made before a final accurate decision can be made by the several governing agencies.

Some of the financial problems that create difficulties for the consultant are caused by reevaluations of the goals and objectives to be considered in the design of an urban freeway. Design goals dealing with aesthetics, environment, ecology, noise, pollution, parks, historical buildings and areas, and relocation of people and businesses have been elevated in importance because of the growing awareness of the impact of urban freeways. If the social amenities are not provided, the project may be blocked by political action. On the other hand, if the social amenities are provided at too great a cost, the project may be disapproved. The consultant must help to find the proper middle course. The solutions differ for different freeways, but criteria must be established for guidance in determining the amount of money that can be justifiably spent in providing the various social amenities.

Although highway development has created perhaps the most sophisticated planning process known to date, it is still deficient and causes problems to the consultant. For example, transportation studies have established the best transportation system based on land-activity projections. If community participation is to be a part of the study, then it is essential that a transportation need be established without a question or a doubt—perhaps by showing the impact to be expected in the entire urban environment with the lack of a transportation system. Present transportation studies usually predict future trips by a linear equation specifically developed for each transportation study area. For example, work trips are usually forecast by an equation using employment and industrial area. The question left unanswered is, Can the same equation be used to determine what will happen in terms of the reduction of employment and industrial activity, if the transportation system is not improved?

Another technical problem is in the consideration of such factors as aesthetics versus cost. Little is known about the user's pleasure or the adjacent neighborhood's pleasure derived from increased landscaping of an urban highway as it relates to cost. Little is known about the impact of an aesthetic improvement that is in conflict with assumed safety features. An example is the visual quality of concrete safety barriers versus side slopes, which might improve highway safety. Other questions of a similar kind that have emerged as problems for the consultant are as follows: How much can be spent to depress a highway rather than to elevate it adjacent to various land uses? Are right ramps safer merely because there are so few left ramps, or are lighting and signing that deficient in directing motorists? How important is standardization to the driver? How can we improve means of communications with the driver?

We believe in the multidiscipline approach to the planning and design of urban freeways. Moreover, we think the very range and complexity of the problems speak for that approach. How else can one hope to enmesh an urban highway in an urban fabric? Surely not by a return to the single-purpose approach in which a road is a road and nothing more!

There are problems reaching beyond the scope of the highway design team, and these problems must be solved if the team is to be fully successful. One such problem is the lack of funds for nontransportation urban improvements. Another problem has to do with the social amenities that are now a part of urban highway objectives. Consultants have been asked to design freeways that reduce noise and pollution. We are trying to do so, but the fact is that little can be done in highway design to reduce noise and pollution because the problem is with the vehicles. The designers and builders of cars and trucks, then, have a role in urban transportation design, a part that Congress recently recognized in its act requiring that pollution-free automobiles be developed.

The multidiscipline design team is part of a community of interest and enterprise that will have to be engaged in developing better urban transportation. This is because urban transportation is a part of urban life. The design team not only has the key role but also provides the format for a still broader kind of multiple-interest effort. The need now is to organize around the design team the other elements needed to make highways and cities really compatible.

## INFORMAL DISCUSSION

Robert G. Bartlett

Although we are learning how to cope with quantifying social or nonphysical improvements, we civil engineers are still having difficulties communicating with sociologists or psychologists. Do you think we will see multiple-agency cooperation in which a park commission and a highway department can work together to develop a park by using the waste or fill excavation caused by highway construction? Do you think we will see a recreation agency put money into a project to build a bike trail parallel to the roadway? Do you think we will see housing agencies participate with agencies representing adjacent land to help solve the social problem? I see many people looking to the highway agency to solve this whole set of problems. Do you think we will ever get all governmental agencies to bear on the problem in a coordinated measure?

Rex Whitton

Yes, I think we will. I do not know when it will come about, but I feel that it has to come inevitably. That is why we stated that all agencies, with the highway agency as the leader, should work together in solving the total urban problem.

Marshall Suloway

I would like to point out the example of the Congress Street Expressway, which is now called the Eisenhower Expressway. When this project began, the excavation from this expressway was placed on the north side of Chicago for an extension of the Outer Drive. Now, even though it is true that the fill was placed for another highway project, there was enough fill to create parkland. We have plans for many other projects such as this.

Robert G. Bartlett

In other words, by using the excavation from the highway project, you were able to add to the parkland in Chicago.

Marshall Suloway

Yes, and this was planned well in advance. In fact, the grading was done probably a year earlier than it was scheduled.

Robert G. Bartlett

You were also able to reduce the cost because of moving the earth only once.

Marshall Suloway

That is correct. In this particular case, we were able to move it by barge, and movement by water is much cheaper and less disruptive than movement by truck.

Robert G. Bartlett

William Gelbach, from a contractor's point of view, what is your reaction to governmental agencies designating such areas for fill and the contractor basing his bid on their use?

William Gelbach

If a bid is bought out and the date of the letting is set, the contractor will have a problem trying to find such a place at that late date. Unless there is multiple-agency organization, such as the one in Chicago, the contractor has to find a place early because if he does not, particularly in the Philadelphia area, the land values sharply increase. The ideal situation is exactly like the one in Chicago.

Robert G. Bartlett

Joint development, then, is more than just vertical use of land over a given corridor. Joint development can be horizontal in terms of using these facilities to benefit other community or municipal programs. If the highway could be the catalyst to providing new parks, new housing, and new recreational facilities, urban highways would be more accepted by the public.