

ECOLOGICAL PLANNING AND HIGHWAY DESIGN

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I think it is fairly obvious to say that ecologists and environmentalists are generally skeptical of highway and transportation planners, and I do not think it would be unjustified to say that highway and transportation planners are also skeptical of ecologists. That put us at the beginning of the Boston Transportation Planning Review (BTPR) on an equal basis. We did not trust each other.

The environmental constituency, as we refer to it, is a special constituency. It is usually made up of a number of people of different persuasions and of different interests: some scientific, some political, some avocational. To identify these groups was, of course, the most difficult process of all. Yet, through the mechanism set up by the steering committee that established the BTPR process, it was determined that there would not be any exclusion of any group that expressed a formal interest in participating. Because it is difficult to determine who is legitimate and who is not, we said, "Everyone is legitimate. You may as well participate because we really do not have the basis to decide whether you are or not." This resolved itself quite fairly. The number of participants at the beginning was reasonably controlled by the number of meetings. There just were not enough people who would attend all of the meetings when they were held. This evolved into a coalition of environmental groups. Unlike contracting groups and labor unions, environmental groups are generally not organized among themselves. They are too new; they are neophytes in the organizational process. Therefore, for the most part, they have worked by themselves as individual entities.

Possibly one of the major advantages of the BTPR, therefore, is that it provided an opportunity for those organizations to unite and express themselves in a unified manner. They were in fact forced to organize and to select representatives who would present their interests alongside the interests and values of many other interest groups, social and political, that participated in the process. Their participation extended to making a major recommendation in the selection of the environmental consultant team. The selection was not made solely by the highway department or the transit authority, and certainly not by the prime contractor. It was made by those agencies in concert with the environmental groups. They interviewed all of the eligible participants and put together an environmental team that expressed to some degree what they thought was necessary for the BTPR environmental effort.

The environmental coalition, which formed a major spearhead of the ecological-environmental interest, was composed of a number of separate groups. The main groups involved were the Transportation Committee of the Sierra Club, the Mystic Valley Watershed Association, the Neponset River Watershed Association, the Save-the-Lynn-Woods Committee, the Massachusetts Clean Air Association, the Environmental Committee of the Greater Boston Coalition on the Transportation Crisis, the Environmental Committee of the Boston Industrial Mission, the Massachusetts Forest and Park Association, and a number of other groups that participated at various times during the review process as their particular interests became apparent. As soon as those were resolved, they were never heard from again.

In the region, there were basically 4 subregions: the North Shore, the northwest, the southwest, and the core. In the North Shore area, we had 13 different environmental groups whose primary concern was the routing of I-95 north of Boston; in the northwest area, we had 8 groups; in the southwest, where the truncated portion of I-95 at Mass-128 was then to carry that road into the heart of Boston, we had 16 groups; in the core, where the inner belt, the central artery, and the third harbor tunnel were issues, we had 14 groups; and in the region, where discussions related to the overall planning for possible futures and ultimate futures in terms of environmental concerns, we had 5 groups. This gives a total of 56 different environmental groups and organizations to be dealt with at one time or another during the 18-month period of the BTPR.

In addition, representatives from our environmental team attended literally hundreds of regional and subregional meetings organized by the groups to discuss with them what the various issues were that they were concerned with.

Three subregions contained a number of major problems, and a number of major constituencies were developed over these various issues. The North Shore region contained the Lynn Woods and the Saugus Marsh, 2 major environmental areas [covered by Section 4(f) of the Department of Transportation Act of 1966] through which the proposed I-95 route would pass. As a subissue (to show the kind of pressures that one can develop from a rational dollars-and-cents or cost-benefit point of view), already sitting in the midst of the Saugus Marsh was a \$14-million embankment on which the road would be placed as it passed through the Saugus Marsh across the Saugus River and up through the heart of Lynn Woods. Lynn Woods was a unique area, encompassing 2,000 acres—the largest municipally owned city park in the country. This was an uninterrupted area of relatively heavily vegetated deciduous forests in which there were 4 potable water reservoirs, a golf course on its perimeter, and a public-access recreation area to its west.

The North Shore problem was reasonably resolved 3 months before the end of phase 1 when, as a result of rather intense analysis of the natural resource element existing in that subregion, the traffic potential, and the existence of the US-1 corridor in a rather degraded position, the governor decided that the US-1 corridor was in fact a prudent and feasible alternative to a route through the Lynn Woods. The US-1 alignment was therefore upgraded, and we discontinued further study on Saugus Marsh and the Lynn Woods.

We then turned our attention to some of the other areas. One of the issues we will not dwell on here was the one in the northwest that brought Mass-2, a major state highway, to the confluence of Alewife Brook, a large wetland area in the midst of an urbanized industrial site that was used quite heavily by the local residents as a wildlife-recreation area. This area is still under study, and there is some concern as to how the issues will be resolved. There are definitely Section 4(f) and environmental issues involved.

The major consideration, however, was in the southwest and concerned a major corridor from Mass-128 through Needham, Dedham, Milton, and West Roxbury, into the heart of Boston, and then on up to the North Shore. At the focal point of the entire issue was Fowl Meadow, a 600-acre wildlife reservation run by the Metropolitan District Commission and used as a classroom by the schools of the greater Boston area. It has resources other than aesthetics, including various species of vegetation and wildlife that were in fact unique to the area; 2 endangered species; a river, which was proposed for relocation; and beneath it a valuable aquifer, which was discovered as a result of

the analysis made. Any highway planner will agree that that is a formidable set of obstacles to overcome.

We felt that the southwest was indeed a key area because construction of the Southwest Expressway was based on the fact that I-95 would come from the south, head through the southwest corridor, and proceed through the center of Boston to the northwest. If the Southwest Expressway were not built, the upgrading of Mass-128 obviously would become a possibility, and the center of the city and the core area would not be subject to a highway corridor. Thus, there was strong polarization among various factions—political, economic, and environmental—as to what kind of answers could be resolved and what type of trade-offs could be made in resolving the Fowl Meadow issue.

We began our analysis of the southwest corridors with a number of meetings with environmental groups. Not only transportation people but also professional environmentalists sometimes find that nonprofessional environmentalists in many cases perceive issues that are in fact not issues. In any case, the only way these issues can be resolved, either positively or negatively, is to find out the facts related to the issues. It is no longer acceptable to simply write off issues, such as fog or water pollution or runoff from the road or the problems that one might have with air and noise or filling and dredging as being insignificant because the National Environmental Policy Act requires that these issues be addressed in considerable detail so that we can resolve conflicts related to the original planning of the highway, the environmental interests, and the future needs.

Our goal was, therefore, to identify, if possible, all the real issues that existed. If the group had an issue that was not a problem, it was incumbent on us as the professionals to undertake enough study so that we could indicate that. If they disagreed, they could get their own consultant and contest our finding. That put us in a relatively objective position, and that was the position that was quite successful.

The other problem we had was one that occurs in any analysis, whether transportation or ecology or economics, and that is that problems not heretofore perceived will be uncovered. That did occur, particularly in the southwest corridor. In the process of the analysis and in response to the public participation, we were able to uncover other aspects of the Fowl Meadow area that were either positive or negative. In documenting those, we were able to come up with recommendations that allowed us to carry a road through the Fowl Meadow, if the governor decided to do that, or, from the opposite point, to preserve that area as a valuable wildlife and water resource.

The analysis that we did was part of the normal analysis that environmentalists do before they make decisions and make reports. It had been our experience in preparing other impact statements to simply be given the charge of what to do, go off in a corner, make our studies, draw up a report, and submit it. In the BTPR, this was not the case. There was no corner to hide in with 56 different environmental groups to deal with. We were in the process right along with the engineers, the planners, and the people who were involved in the transportation analysis from the very beginning to the very end. We learned a lot from them, I might add, and I hope they learned something from us.

We first documented, once again in response to the public's need for knowledge about the area, the surface water features of the Fowl Meadow area. The Neponset River, we found out, was of much better quality than anticipated, and in fact much of the work done by the Massachusetts Department of Natural Resources in cleaning up the watershed was beginning to show in increased water quality and improved fisheries through the area. All of the standing-water wetland and drainage areas were documented.

Then we made a complete analysis of the vegetation to answer the questions, What species are there? Why are they valuable? Some people had thought there were more species than really existed; some of them could never have existed there because none of the vegetation, landform, food, or reproduction requirements were present. Thus, an analysis is made both to prove and to disprove things.

Then an analysis was made of the various soil types because they indicate to a great degree the bearing capacity of the road and the subsequent effect of drainage and runoff. We determined the K factor in terms of erosion and runoff so that we could know, if we disrupted or changed the natural movement of water that came from the Great Blue Hills, a short distance away, and rushed through this area down to the Neponset River,

what effect that would have on subsequent water quality downstream as well as on vegetation and wildlife in this area.

Another analysis of surficial geology was extremely important because it began to give us a key as to what type of road construction we could have. For example, in one area there was a great depth to bedrock, on top of that sands and gravels, and over that a cap of peat. By knowing what the surficial conditions were, we were able to determine what type of structure we could build that would neither interrupt the natural flow nor puncture the peat layer on top of the aquifer.

As a result of our analysis, we found that the entire central area of the Fowl Meadow was one huge aquifer that was being tapped by only a small well, and no one had any idea how extensive it was. We wanted to preserve this because it could be a valuable source of water for an area where water is becoming rapidly depleted. Thus, we had a definite environmental concern here that had not been identified before. We determined that there was a surplus of 13 billion gallons of water available. We had to work very closely, almost on a day-to-day basis, with the engineers so that we could resolve the types of structures that could be placed in this area without serious environmental impact.

We had public land; we had access through the area; we had what was originally going to be an embankment that would have blocked access unless we had tunnels of some kind. But there would be major environmental impacts: recreational opportunities; Paul's Bridge, which was both an aesthetic and historical site and also served as a flood control device for flooding the area when the Neponset River overflowed; and the relocation of the Neponset River. There were also fog as a traffic safety problem, noise and air pollution resulting from the location of the facility within the wildlife refuge, runoff, and ramps and intersections that would have to be constructed in the midst of another aquifer and wildlife area.

An alternative across Fowl Meadow at the shortest possible point was developed both by the environmental and the engineering staff in a very short period of time, and this resolved many but not all of the serious issues that would have arisen had we done this without public participation.

I have given not a technical discussion but just a description of how public participation and the various interdisciplinary activities of the staff made it possible to resolve something that might not have been resolved had we not gone through this process. The engineers developed the various options. These were taken to meetings and discussed with the various environmental groups. We outlined what we thought the problems were, and they came back and told us what they thought the problems were. We were able to put these in a form for evaluating the trade-off factors of cost; residential, business, and environmental impact related to human use; and ecological impact related to natural systems and areas covered by Section 4(f).