ENVIRONMENTAL IMPACT STATEMENT AND TRANSPORTATION PLANNING: HOW DOES THE PROCESS WORK?

by

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ABSTRACT

The National Environmental Policy Act of 1969 prescribed federal agencies to prepare environmental impact statement (EIS) for their major actions significantly affecting the environment. The preparation and review process has been included in the planning process of the administrative agencies.

This paper analyzes the filed EISs of the three highway projects in Massachusetts in order to clarify how the EIS process works in the planning and designing decision-making of the agency.

First, the problems of the three EISs' contents are defined and discussed. Concerning the deficiencies of the contents, improvement can be achieved by use of the checklists, but most of the problems deal with the planning process.

Then, the EIS process integrated in the planning process of the three projects is evaluated on the basis of the five criteria which are 1) coordination with other agencies, 2) public participation, 3) benefits, 4) social equity, 5) objectivity. Further, the Massachusetts Action Plan, which aims to organize economic, social, and environmental impact consideration in the highway project planning, is also evaluated by the five criteria. The defined common problems such as delegation or decision-making in the EIS process are discussed.

Finally, resolution of conflict which can be seen in the three EIS cases is sought, assessing the special techniques such as referenda, mediation etc.
ACKNOWLEDGEMENTS

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I. Introduction

The increased concern in the late 1960's about the destruction of the environment finally brought about the enactment of the National Environmental Policy Act of 1969 (NEPA). This Act declares "a national policy which will encourage productive and enjoyable harmony between man and his environment". (Sec. 2) To insure protection and enhancement of environmental quality as a national goal, NEPA provides that all agencies of the federal government shall "include in every recommendation or report on proposals for legislation and other major federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on:

(i) The environmental impact of the proposed action,
(ii) Any adverse environmental affects which cannot be avoided should the proposal be implemented,
(iii) Alternatives to the proposed action,
(iv) The relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
(v) Any irreversible and irretreivable commitments of resources which would be involved in the proposed action should it be implemented". (Sec. 102 (2) (c))

Thus, all the federal agencies must prepare a detailed environmental impact statement (EIS) for major actions for which their agency is responsible that significantly affect the quality of the human environment.
In addition, the Act proclaims that the EIS shall be reviewed by the other federal, state, and local agencies, and that the EIS, with the comments and view of the other agencies, shall be made available to the President, the Council on Environmental Quality (CEQ), which was established by NEPA, and to the public. The guidelines of the CEQ make precise not only the content of the EIS, but also the review process, by providing that the draft EIS be circulated for review by the agencies and the public 90 days before taking action, and that the final EIS be published 30 days before taking action. This review process has caused changes in the federal agencies' planning process in order that the federal agencies' plans may reflect the opinions of the other federal, state, and local agencies, and the public.

Five years have passed since the enactment of NEPA, and the EIS and the process of its preparation and review have been improved and more clearly established. More than 3140 EIS's were published up to June, 1973. Federal agencies, such as the Department of Housing and Urban Development, the Department of Interior, the Department of Transportation, etc. have conformed to NEPA by establishing guidelines and regulations concerning EIS's.

Considering this situation, this paper focuses on what the EIS treats and how it functions in the planning, design, decision-making processes of the administrative agencies. From this viewpoint, the three highway projects in Massachusetts are selected.
The problems of these three EIS cases are identified and recommendations based on the analysis of their problems are made. The reasons why the subject of highway projects is selected are (i) that highway project EIS's are the most common of all EIS's* and (ii) that the Federal Highway Administration (FHWA), Department of Transportation (DOT) (i.e. the administrative agency for road building at the federal level) has conformed to NEPA well, as can be seen by the publication of Policy and Procedure Memoranda (PPM) 90-1, 90-4.

In Chapter II, the summary of three highway projects is explained briefly. Chapter III defines the importance and/or common deficiencies of the EIS's' content, draws conclusions and makes recommendations. Chapter IV examines the process and procedure of the EIS, analyzes the problems, and makes some recommendations in conclusion.

* The CEQ annual report of 1973 shows that among the total 3140 filed EIS's, 1872 EIS's are road projects.
II. Brief Description of Cases

Four highway EIS's have been filed in Massachusetts. One of them was a very small scale project--i.e. an interchange between Spin Street and Route 9 in Natick, and was excluded from this study. The three cases that were selected are:

1) Interstate Highway Route 95 from the Danvers-Middleton town line to the Merrimack River in Newburyport;
2) Amherst Northeast Bypass;
3) Interstate Highway Route 190 (Massachusetts Route 52) from north Worcester to Leominster.

Through these EIS's were approved and filed (so that they meet the provisions of NEPA and the related regulations), each case has problems and caused controversy.

A. I-95

The existing highway from the Danvers-Middleton town line to the Merrimack River was constructed in the early half of the 1950's as a divided four-lane state highway. As the years passed, the road capacity had become insufficient and the structure deficient. Therefore, a highway improvement project was planned by the Massachusetts Department of Public Works (DPW). The improvement plan was approved by the DOT prior to the enactment of NEPA, but an EIS of I-95 was prepared, because the design approval prescribed by PPM20-8 had not been given before the enactment of NEPA.

I-95 currently passes through the towns of Middleton, Topsfield, Boxford, Rowley, Georgetown, Newbury, West Newbury, and the city of Newburyport, for a distance of almost seventeen miles. (Figure II-1)
The proposed project is to widen this existing route from four lanes to eight lanes in order to update the design and meet the projected traffic for 1990.

The EIS was approved by the FHWA in September, 1973. However, a citizen group opposing the project, the Essex County Preservation Association, brought an action against the DOT and the DPW to the U.S. District Court in July, 1974. Temporary orders restraining further construction were denied and a request for a permanent injunction is pending. The contracts for some parts of the route have already been awarded.

B. Amherst Northeast Bypass

In the latter half of the 1960's, the Town of Amherst and the University of Massachusetts recognized the need for a new bypass separating the commuter traffic serving the University of Massachusetts from local street traffic, to alleviate the current traffic congestion and particularly to remedy the pedestrian/vehicular traffic problems on the existing road facilities.

Having been asked to review the problem and to make recommendations, the DPW held a public meeting in October, 1970, and presented Alternate I. (see Figure II-2). In response to this, a Traffic Circulation Committee (TCC) was created by the Town Meeting to further study the problem. Thus, the Amherst bypass project was locally initiated and to a great extent, the authority for decision making was entrusted to the Town.

Since the bypass was federally aided in fund, an EIS was prepared.
FIGURE II-1 EXISTING INTERSTATE ROUTE 95 AND ALTERNATIVE ROUTES

SOURCE: U.S. HIGHWAY ADMINISTRATION
During the draft EIS study, the Town Meeting approved Alternate II A, and thus the draft EIS recommended Alternate II A. After the draft EIS publication, however, a special Town Meeting rescinded the previous decision and approved instead Alternate II C. Ultimately, Alternate II C was the final recommended alternative.

The length of the proposed new bypass is less than four miles, and the location is almost entirely within the limits of the Town of Amherst; and in comparison to the I-95 project and the I-190 project, the scale of this project is relatively small.

C. I-190 (Route 52)

In order to improve local traffic safety and efficiency on Route 12, and to support development in the central Massachusetts region, a new expressway between Interstate 290 and Massachusetts Route 2 was planned in the 1960's. This 16-mile section of Route 52 (redesignated as Interstate 190) was designed to pass through the cities of Worcester and Leominster and through the towns of Holden, West Boylston, Sterling, and Lancaster. (see Figure II-3).

Route 52 presently runs between New London, Connecticut, and Webster, Massachusetts (60 miles); is designed but not constructed for the 7.5 miles between Webster and the Massachusetts Turnpike; and continues as completed I-290 for the 7.5 miles between the Turnpike and northern Worcester. The ultimate extension of Route 52 in a northerly direction from Route 2 is possible but is now only in a conceptual stage.
LEGEND

- RECOMMENDED LOCATION
- OTHER ALTERNATIVES
- PORTIONS OF ALTERNATIVES NOT COVERED BY VOLUME I AND II

SOURCE
CE MAGUIRE, INC.
ARCHITECTS-ENGINEERS-PLANNERS
AND
UNIVERSAL ENGINEERING CORPORATION
The proposed extension of Route 52 was announced by Governor Volpe in 1967. Several public hearings were held and location plans for parts of the Route 52 section were presented. An EIS was separately prepared for each of the three segments of the project, with the volumes of the EIS corresponding to the division of the segments. Volume I deals with the nine-mile southern segment between northern Worcester and Massachusetts Route 62 in Sterling. Volume II treats the seven-mile northern segment between Route 62 and Route 2. Volume III contains the comments to the draft EIS of both segments (Volume I and II) and the responses. Volume IV is the EIS for the four-mile Worcester segment between I-290 and Route 12. The EIS recommended the Far West Alternate location for Volume I and II, and recommended the location indicated as Figure II-4 for the Worcester segment (Volume IV).

Nevertheless, since the publication of the final EIS, the Town of West Boylston has opposed the recommended location, proposing the alternative, 1974A Plan which is not included in the EIS, and the Town of Sterling has also opposed the Far West Alternate proposing their alternative which detours around the Town center far away, and this alternative is not included in the EIS, either. Both towns are waiting for the reaction of the DPW. In addition, there is a citizen group, the I-190 Concerned Citizens, that opposes the new highway and brought a law suit against the DPW.
FIGURE II-4 Location of Route 52 (Worcester Segment)
Source: Final Environmental/Section 4(f) Statement for Route 52 Expressway
III. Important Problems of EIS Content

This chapter studies the EIS's as a document or information source and discusses what they treat in the three cases and what problems they contain.

A. Structure of content

1. Fragmentation

The problem of fragmentation of the EIS is particular to the Route 52 case. The EIS of Route 52 is composed of four volumes. The first volume contains the summary pertinent to the complete project (summary of Volume I and II) and a detailed EIS of the nine-mile southern segment (from the vicinity of Malden Street in northern Worcester to Route 62 in Sterling). Volume II contains the EIS of the seven-mile northern segment (from Route 62 to Route 2 in Leominster). Volume III contains the comments and responses of both segments. Volume IV consists of the EIS (final and draft EIS's), comments and responses, and the Section 4 (f) statement for the four-mile section from I-290 to Route 12 near the Worcester-West Boylston Town line. The separation of the subjects of Volumes I and II (or the southern and northern segments) reflects the delegation of the construction design: i.e., the design of the southern segment was delegated to an engineering firm, and the design of the northern segment was delegated to another firm. Both engineering consulting firms prepared an EIS for the segment which the firm designed.
Aside from the problem of conflict of interest or delegation (it is discussed later in the study of process), the separation of the volumes was inadequately made, because it is not based on environmental consideration. For example, the town of Sterling is divided into two parts and thus treated separately in the two volumes, so that the total impacts on Sterling cannot be easily understood. Furthermore, the analysis contained in Volume I is rather different from that in Volume II, and this difference undermines any unified conception of the project. In addition, the final EIS contained in Volume IV (concerning the Worcester segment) is very brief, incomplete and needs to be supplemented by the two divided parts of the draft EIS's. Thus, the arrangement, style and form of analysis in each volume of the EIS is different, and makes the impacts of the total project difficult to comprehend. Some commentors indicated this problem regarding the draft EIS, but the final EIS is not improved. This inadequacy of arranging the segments resulted in the duplication of the project's background and history, of the discussion of the need for the highway, and of the description of the regional impacts. This duplication is one of the reasons why this EIS is so voluminous.

2. Organizational structure of content

The parts of the three EIS's we are considering are similar, although the depth of their respective treatments differs. The ordering or flow chart of the content of the EIS is a little different, reflecting the specific situation of each.
The organizational flow charts of the three EIS's are shown in Table III-1. In the I-95 case, the proposed improvement plan and its impacts are explained before the examination of the alternatives. In both the Amherst bypass EIS and the Route 52 EIS, the alternatives are examined and then their impacts are assessed. In the Amherst bypass EIS, the impacts of all the alternatives are assessed, but the Route 52 EIS evaluates the alternatives and then assesses the impacts of selected alternatives in detail. The northern segment (Volume II) of the Route 52 EIS describes the probable impacts of new highway on three separate areas in the segment without definite location of the highway before evaluating the alternatives. The assessment of impacts prior to defining the location is tedious and unnecessary. In order for the EIS to comply with and reflect the EIS development process, the structure of the EIS content should be as shown in Table III-2.

3. Problem of volume, appendix treatment, and summary distribution possibility

The I-95 contains 317 pages of text and 151 pages of appendices including the comments about the draft EIS and the responses. The Amherst bypass EIS has a main text of 128 pages, an appendix section containing the documents that were written during the planning process prior to the EIS which consists of 180 pages, and a comments and responses section which is 119 pages long. The Route 52 EIS consists of four volumes.
### TABLE III-1 Structural Flowchart of Three EISs

<table>
<thead>
<tr>
<th>Section</th>
<th>I-95</th>
<th>Amherst Bypass</th>
<th>Volume I</th>
<th>Volume II</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Description of the proposed improvement and its surroundings</td>
<td>Readers guide</td>
<td>Description of the proposed Route 52 and its environs</td>
<td>Description of Rte. 52</td>
</tr>
<tr>
<td>II</td>
<td>Probable impacts of the proposed improvement</td>
<td>Location maps</td>
<td>Alternatives</td>
<td>Alternatives</td>
</tr>
<tr>
<td>III</td>
<td>Probable unavoidable adverse environmental effects of the proposed improvement</td>
<td>Location and description (background and present situation)</td>
<td>Probable impacts</td>
<td>Probable impacts of two alternatives</td>
</tr>
<tr>
<td>IV</td>
<td>Alternatives</td>
<td>Alternatives</td>
<td>Relationship between short-term use and long-term productivity</td>
<td>Irreversible and irretrievable commitment of resources</td>
</tr>
<tr>
<td>V</td>
<td>Short-term use vs. long-term productivity of environment</td>
<td>Probable impacts</td>
<td>Irreversible commitment of resources</td>
<td>Measures to minimize adverse impacts</td>
</tr>
<tr>
<td>VI</td>
<td>Irreversible and irretrievable commitment of resources</td>
<td>Probable unavoidable adverse impacts</td>
<td>Relationship between short-term use and long-term productivity</td>
<td>Irreversible and irretrievable commitment of resources</td>
</tr>
<tr>
<td>VII</td>
<td>Measures to minimize adverse impacts</td>
<td>Relationship between short-term use and long-term productivity</td>
<td>Measures to minimize harm</td>
<td></td>
</tr>
</tbody>
</table>
TABLE III-2 Recommended Structure of EIS

- Background
  (present situation of the area)

- Examination of alternatives

- Probable impacts of selected alternatives

- Selection of alternatives

- Unavoidable adverse probable impacts

- Relationship between short-term use and long-term productivity

- Irreversible and irretrievable commitment of resources

- Measures to minimize adverse impacts
Volume I (southern segment) contains 48 pages summarizing Volumes I and II, and 110 pages of text about the southern segment. Volume II (northern segment) contains approximately 300 pages. Volume III (comments and responses) consists of 391 pages. Volume IV has 386 pages. Thus, the total of the four volumes is 1,235 pages. If some people are concerned only about the impacts on their neighborhoods, they may not need to read all the volumes, but in order to understand the total project, it is necessary to read the whole.

The Route 52 EIS is too voluminous as compared to the others, even taking the scale of the project into consideration. NEPA provisions require a detailed EIS and therefore, depending on the project, such voluminous EIS's may be necessary. However, the Route 52 EIS includes many duplications of material and many unnecessary parts, and thus it should be reduced in size. Further, if the volume of the I-95 or Amherst bypass EIS is adequate from the viewpoint of sufficient detail and succinctness, there may be a problem for lay readers. Although relevant federal, state, and local agencies that have the expertise, jurisdiction, and responsibility to comment on EIS's, as well-interested citizens and citizen groups, need a detailed EIS in order to make useful comment, over one hundred pages of text may discourage the lay public from reading the EIS by virtue of its length. One way to make the EIS succinct is to move the basic source data and assessments, which are too technical and specialized for most laymen, from the text to an appendix, as the CEQ guidelines indicate.* With this format, interested lay readers who are directly affected by a proposed project or very concerned about the impacts of such a project can turn to the appendices for the detailed information that they seek.

* In §1500.8 of the federal regulations, it is provided that highly technical and specialized analyses and data should be avoided in the body of the draft EIS's.
However, the cutoff level of "technicality" is not easily defined. Perhaps a good EIS process involving sufficient coordination with other agencies and the public can clarify the priorities of interests or importance of impacts and, therefore, it can cut down unnecessary diffuse description of analysis.

For the purposes of educating general lay public or providing public relation materials, a summary of the EIS could be published separately and/or printed in the local newspapers. However, the complete EIS should be available to everyone that wants to read it.

B. Deficient explanation of the need for the proposed project

All three EIS's presented in this paper discuss new construction. Widening the existing road is recommended in the I-95 EIS and new highways are proposed in the Amherst bypass EIS and the Route 52 EIS. The origins of all three of these proposals are based primarily on projections of traffic demand. Specifically, the I-95 improvement was proposed because of the insufficient existing capacity for the expected future traffic, the present deficient road structure, and the out-dated design of the highway. The Amherst bypass was proposed because without it the existing roads (such as North Pleasant Street) connecting the town center and University of Massachusetts would be congested and other detrimental effects would be caused. The Route 52 plan was also based on the projections that indicated that the existing Route 12 from Worcester to Fitchburg would not meet the safe operating capacity by 1980. In addition, the fact that past regional and municipal studies indicated the need for a new highway and also influenced the proposal for a new Route 52.
Thus, in all three cases the perceived need for these proposed projects depended on the traffic projection model. Future roadway traffic is usually projected by the DPW's simulation model,* and the present and planned service is evaluated in terms of future demand. This projection method is too technical for most lay persons to understand and thus the public is placed in a position in which they are asked to believe the results of studies conducted by "experts". Or the public looks at the past performance of the DPW and judges based on their experience and intuition. If the public distrusts the DPW or the government, they may doubt the projections. For example, a citizen affected by the proposed I-95 improvements was skeptical about the necessity of the project, saying, "Nobody knows the future".* In another instance, the citizens group, (Essex County Preservation Association), that brought a legal suit against the DPW mentioned the energy crisis as one of the reasons for questioning the necessity of the I-95 improvement project.

In the Amherst bypass and the Route 52 EIS comments, some citizens expressed their suspicion about the need for the projects, mentioning the gasoline shortage and President Nixon's policy of funding for mass transit purposes.

While from the long-term point of view, a probability that the projected traffic comes true may be high, the probability is not equal to one. Therefore, the basic assumptions of the projection model should be stated and the probability should be clarified so that the chance to weigh environmental factors and to assess the need for the project can be available.

* In the EIS's, it is not described what kind of simulation model the DPW used for the traffic projection. However, basic data and forecasts are shown on a plan of the DPW, Bureau of Transportation Planning and Development, dated September 5, 1972.

* Personal interview. This citizen asked that his comments remain anonymous.
At the very least, the need for the project should be stated in a more understandable and lucid fashion. This problem also related to the EIS process and is discussed later.

C. Alternative selection

Generally, many alternatives to any project can exist. The FHWA's regulations state that "examples of such alternatives include alternative locations and designs, not implementing the proposed action, postponing the action, providing a lower level of service, providing a reduced facility (lanes/design), and an increase or decrease in public transportation".

The I-95 EIS describes a feasibility study done in 1964 on the possible improvements to increase the capacity of I-95 and to update the highway to present interstate standards and then examines the following five alternatives: 1) no-build; 2) major relocation to the east; 3) major relocation to the west; 4) dual-dual alternative; 5) alternative transportation modes. (Figure II-1) These alternatives are disregarded for various reasons and the improvement of the existing highway from two lanes to four lanes in each direction was selected and the impacts of the proposal are assessed in detail. However, the minor alternatives to widen the east side or the west side in small scale areas are not discussed enough.

The Amherst bypass EIS studies four alternatives: 1) new construction, plus upgrading the existing facilities (Alternate I); 2) primary new construction (Alternate II); 3) primary upgrading of existing facilities (Alternate III); and 4) no-build. (Figure II-1) The new construction option includes three major alternative locations for its eastern terminus. However, the other alternatives are viable.

* Dual-dual alternative is to construct two-lane road outside the existing two-lane road in each direction so that the total lane becomes eight but different from eight-lane road.
For example, new construction from Route 116 to East Pleasant Street plus upgrading East Pleasant Street, Strong Street, and North East Street, or new construction from Route 116 to Strong Street (this is the same as the north west part of Alternate II) plus upgrading Strong Street and North East Street, or using the eastern area of North East Street can be thought as alternatives. These possible alternatives are described in Appendix A (documents relevant to the history of the project) and Appendix D (comments and responses) of the EIS, but they are not discussed in the main text. The discussion of these alternatives should be included in the main body of EIS. If they are not considered optimal, the reasons for this judgement should be explained. Although the citizens of Amherst may have been convinced of dropping these alternatives in the process of discussing the proposed bypass, this decision is not clear to the reader. In addition, it is noteworthy that at first the DPW proposed Alternate I; however, the town of Amherst hired a consultant to find other suitable alternatives, and Alternate II was finally proposed as the history of the project shows.

The Route 52 EIS discusses four basic alternatives. They are as follows: 1) no-build; 2) improve the existing highway; 3) change the balance of alternative transportation modes; 4) consider alternative expressway locations and designs. The first three alternatives were rejected as a result of simple estimation of the impacts. Then the alternative of a new location and design of the highway was considered. The southern segment EIS described seven alternatives. (Figure II-3) Two of them were selected and their impacts were assessed in detail.

Before the enactment of NEPA, the DPW presented two alternatives at the first public hearing on Route 52.
During the EIS study, the above alternatives were devised, and in addition another alternative route was proposed by a citizen group.

These three cases indicate that the theoretical invention of alternatives is often difficult; new alternatives seem to be most often found by the affected parties.

D. Probable impacts

1. Natural environment

The impacts on the natural environment (such as air, water, and noise pollution) are studied relatively well in all three EIS's. These impacts can be assessed quantitatively with simulation models. However, there remains the problem of accuracy of the models and of the extent of the lay public's technical knowledge. First, as with traffic projection models, simulation models are based on assumptions and simplifications, and the resulting projections are not always right. While the existing most suitable prediction methods are obviously necessary, the uncertainty factor of the degree of accuracy of the method should be identified. The measures to counter the adverse effects, that may result from uncertain predictions should be considered. The assessments of impacts on flora, fauna, and on the ecosystem in general also have a degree of uncertainty. This uncertainty should induce the necessity of inspecting and monitoring the pollution level during and after the implementation of the project. Such a monitoring system exceeds the EIS process, but it should nevertheless be considered in the planning process.

Secondly, natural environmental impact assessment is too specialized for the lay public to check and thus the role of the EPA and other agencies as a "watch dog" becomes important.
Nevertheless, there may be a problem of overly specialized information for laymen if they distrust bureaucracy and seek the source data before they form their own opinion.

2. Social, economic impacts

It is difficult to assess the social and economic impacts of a project precisely; the analyses of these impacts in the three EIS's in question are superficial compared with the analyses of the impacts on the natural environment. Commonly, land use effects are claimed to be suited to the objectives of regional and municipal plans, or land use plan and regulations, such as zoning, are claimed to be adequate to control the adverse impacts. However, the land use change, especially in the vicinity of interchanges, is not predicted concretely. Possible harm should be warned of boldly; the warning can assure the utilization of the counter-measure of land use regulations.

The numbers of relocated houses and businesses is described in these EIS's, but the property value decrease caused by noise and aesthetic deterioration in the vicinity of the proposed location is not discussed.

The analyses of probable impact deal with beneficial and adverse effects. Based on an evaluation of priorities, the alternative plan whose benefit most exceeds the probable loss is selected. However, the beneficiaries and sufferers are not necessarily the same, and in fact are different in most cases. For example, the I-95 improvement will bring the most benefit to the users of the highway, who are mainly tourists, while the relocated families, adjacent property owners, and people concerned about the loss of wetlands suffer from the adverse impacts.
Likewise, the Amherst bypass is beneficial to the commuters to the University and also to residents of the town center and congested streets, but it is not desirable for the residents near the new bypass location. This conflicting interest reflects the nature of the trade-offs involved in highway improvement projects. The EIS's do not clarify these trade-offs clearly. Furthermore, the lack of identifying the sufferers and beneficiaries leads to a problem of social equity, especially in terms of the measures proposed to minimize harm and to provide compensation.

After discussing all impacts, the final EIS proposes the "best alternative". For that purpose, the trade-offs should be defined, and the priority or weight given to the impacts should be explained. The EIS's of the three cases in question show neither the trade-offs nor the priority given to the benefit and to the adverse impacts. The trade-off or priority is important for decision making. R. Dorfman and H. Jacoby describe in their paper as follows:

"Any sensible decision must correspond to some set of weights: we proved that any decision of which that were not true could be altered so as to increase some party's satisfaction without detracting from anyone else's. So if we could solve the problem for all possible, or plausible, sets of weights, we should have a set of decisions that would include all those that might reasonable be expected to emerge".

Thus, "in order to gain insight into the points at issue and their likely resolution", recognition of the trade-offs and plausible priority are essential for decision making.

E. Probable unavoidable adverse effects. The relationship between local short-term use of man's environment and the maintenance and enhancement of long-term productivity, Irreversible and irretrievable commitments of resources
Probable unavoidable adverse effects are extracted from the probable impacts in a summary form that shows the adverse effects which proper measures cannot reduce to acceptable levels. The Route 52 EIS does not contain a section on these unavoidable impacts.

The section regarding "the relationship between local short-term use of man's environment and the maintenance and enhancement of long-term productivity" typically justifies the proposed project, claiming that the social and economic benefits resulting from the proposed project surpass the adverse environmental impacts.

As to irreversible and irretrievable commitments of resources, the three EIS's under consideration mention construction materials, required land, the existing vegetation and marshlands, human resources, and monetary resources as the primary resources that will be irretrievably used.

These three sections are prescribed by NEPA, but the law does not specify a relative level of importance to be attached to them, and the meanings of "the relationship between short-term uses and long-term productivity" and "irreversible and irretrievable commitments of resources" are not defined with sufficient clarity. Thus, these sections in the three EIS's being considered seem to be written solely for the purpose of satisfying the provision of NEPA.

F. Measures to minimize harm

For noise abatement, noise barriers, berms and planting are mentioned. As to water pollution control, mulching, seeding, and sedimentation basins are the suggested counter-measures.
The measures to minimize physical effects are generally well thought out, but the measures to minimize social and economic harm are poorly considered, especially since these EIS's expect that the social environmental impacts will be beneficial. Relocation programs are relied on strongly, and certainly they have progressed, but it is not sure how the relocated people are satisfied with them. The relation of adverse impacts induced by the development to local land use plans is important, but it is not discussed in this section on the measures to minimize harm. In addition, the EIS's are too confident in the power of use regulations or other plans to control unwanted growth.

Appropriate measures to minimize adverse effects relate most directly to the actual design of the project and thus often cannot be specified in the EIS stage. Therefore, the specification and implementation of these measures should be considered in the total planning process rather than only in the EIS.

G. Maps

The use of adequate maps is recommended by the CEQ guidelines and the FHWA's PPM90-1. The FHWA's new regulation, which is revised PPM20-8, 90-1 and 90-4, provides that "vicinity and detailed maps, sketches, pictures, layouts and other visual exhibits should be used to show specific involvement in order to give a layman reviewer a reasonable understanding of the impact", the existing and proposed land-use maps are preferable and that alternatives should be discussed with maps. In the three EIS's discussed in this thesis, maps are used with various explanations, concerning such matters as land use and alternatives as well as noise contour, air pollution, and water flood areas, etc. However, the basic maps used in the three EIS's are different.
The I-95 EIS uses maps like that in Figure II-1, and at the end of the text is included a precise location map (scale 1/4800) with noise contours. The Amherst bypass EIS's basic map is like that in Figure II-2, and it shows no contour line or buildings. In addition, the topography map (U.S.G.S. Map) and the land-use map in the Amherst bypass EIS are based on different source maps, but the quality of reproduction is not legible. The Route 52 EIS, Volumes I and II, uses the reduced U.S.G.S. map mainly. Thus the topography is intelligible, but the contour lines are printed so thickly due to the reduction that the information about land use characteristics cannot be distinguished well and also the writing cannot be easily read. Generally, the more reduced the scale, the less detailed the information such as houses affected by noise or relocation. However, the size of the maps is limited and thus the scale used depends on the scope of the project. When the scale of the project is too large to express the effects on the small areas in one map, small area maps should be used to show the effects. The U.S.G.S. map is useful for experts, but it is not necessarily understandable for laymen. On the other hand, the map of the Amherst bypass EIS is simple, but it is too simple for the specialists.

Since some citizens are able to understand the U.S.G.S. map, it should be used, but a reduced U.S.G.S. map is not appropriate if the contour lines become thick and letters become illegible. Furthermore, control of the printing quality is necessary.

After all, the maps in the EIS should show spatially what the project will affect. Therefore, affected buildings, land use, parks, forests, rivers, lakes, wetlands and so on should be clarified in the maps.
In order to help readers understanding the impacts spatially and concretely, various maps should be used depending on the characteristics of the impacts.

H. Chronology and comments/responses

The EIS has the function of informing the public about the planning process of a project. From this viewpoint, a summary of the project's chronology is useful. Such a summary should relate to the history and the process of planning the project and should state how meetings were held and what consultations with other agencies were made, etc.

Comments and responses are important, because they show how other agencies and the public reacted to the draft EIS and how these reactions are responded to.

The comments can be categorized as follows:

1. Comments opposing the project

There are relatively few comments of this type in the three EIS's. Commentors who oppose the proposed project usually claim that what will be lost by the project (e.g. natural resources) is more valuable than the benefits of the project (e.g. growth, progress, or convenience). The response to these comments is to refer the writer to the description of the project need or to the no-build alternative, or they are not responded to.

2. Comments recommending other alternatives

These comments are made by the agencies and the public. Usually, the agencies prefer the alternative which causes the least impacts on their jurisdiction. Therefore, if the proposed alternative is not what they want, they recommend another alternative that affects their jurisdiction least negatively, considering the other impacts.
Also the residents around the proposed alternative route usually oppose it and recommend another alternative, since "obviously no one wants a highway near him, and someone must suffer if it is built".*

For example, in the Amherst bypass EIS, the Department of Interior and the Sierra Club opposed the proposed terminal alternative, recommending another because of the impacts on the historical areas and the elementary school near the proposed one route.

The validity of these comments may be accepted as the Amherst bypass case or the justification of the proposed alternative may be claimed in response.

3. Comments indicating deficiencies in the draft EIS

In the three EIS cases, most of the agencies' comments can be categorized in this group. For example, the EPA made detailed comments regarding solid waste, water, air and noise pollution, indicating an improper analysis or insufficient information.

The residents who accepted the recommended alternative, even though they would be affected, ask for measures to minimize harm. For example, in the Amherst bypass case, two farmers whose farms are adjacent to the planned intersections requested a drainage system to avoid a run off water problem.

In response to these comments, some sections of the EIS are revised and other comments are referred to the justification or are not responded to. Some of the information that the comments requested was concerned with the final design or the construction stage and thus could not be answered. This point reflects the limit of the EIS review system and therefore a design review or construction inspection or monitoring system may need to be considered.

* The comment of H. Yost, The Amherst Bypass EIS.
Minor revisions and distinct errors or lack of analyses were corrected in all three cases.

4. Comments supporting the proposed corridor

Usually, the part of the public concerned that their interests will be affected adversely by an alternative other than the proposed one supports the proposed alternative. Particularly, the residents near the other alternative route support the recommended alternative strongly.

Thus, the comments and responses indicate detailed environmental impacts not included in the text, the opinions of the agencies and the public, and proposed improvements of the EIS. Some comments are not responded to.

I. Conclusion and recommendations

Although the three EIS's were approved by the FHWA and filed, there remain deficiencies in their content. Many deficiencies are improved by the review process, but the problems described above exits, and each EIS omits some impacts.

The CEQ guidelines for the preparation of EIS's, as well as the FHWA's PPM90-1, have been revised recently, and the provisions of the EIS content have become more detailed. However, they are still rough and checklists could be useful for the efficient preparation and review of EIS's. The University of Massachusetts Impact Assessment Program has prepared a draft "legal sufficiency checklist", based on the CEQ Guidelines, the Rules and Regulations of the Executive Office of Transportation and Construction, the FHWA's PPM0-1, the Massachusetts Environmental Policy Act, and the Environmental Design Factors Booklet of the DOT.
The use of this kind of checklist may improve the EIS, especially in assuring that the categories of impacts are covered thoroughly. However, it may still be difficult to improve the depth of these assessments.

Fundamentally, the environmental impact assessment is guesswork and all new construction projects are accompanied by uncertainty and unknown impacts. The past legal suits concerning highway project admitted this point.

In the Swain V. Brinegar case, the District Court held that:

"An exhaustive examination of every conceivable minor environmental effect of a given project, even though patently and cumulatively detrimental, is simply not required by NEPA."

In Daly V. Volpe, the decision said, "Courts which have considered the sufficiency of EIS's have consistently realized that perfection is unattainable."

Thus, although the EIS should be as complete as possible, it has limitations. Perhaps these limitations can be ameliorated by the process. From this viewpoint, the review process becomes important; and many problems described earlier relate to the process of the project. The EIS is a report which shows how the project will affect the human environment and, thus it can function as source material for decision making. After all, the EIS documents the planning process, and from this standpoint, the process becomes very important and needs to be examined.
IV. EIS Process
A. Objectives of the EIS and conditions necessary for achieving these objectives

1. Objectives

The objectives of NEPA are "to encourage productive and enjoyable harmony between man and his environment", "to prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man", and "to enrich the understanding of the ecological systems and natural resources important to the Nation." (Sec. 2)

The primary concern of the Congress that enacted NEPA was the need to control the negative impacts on "the natural environment, particularly those caused by the profound influence of population growth, high density urbanization, industrial expansion, resource exploitation and new and expanding technological advances." However, NRPA does not aim at protecting or enhancing the quality of the only natural environment. Rather "the human environment", including not only the natural but also the social environment, is to be considered by the EIS, in order to "achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life's amenities." (Sec. 101 (b) (5)) NEPA indicates that the total human environment must be considered "to foster and promote the improvement of environmental quality to meet the conservation, social economic, health, and other requirements and goals of the Nation." (Sec. 204 (4))
Furthermore, NEPA proclaims that the balance between the environmental value and social benefits shall be pursued. In the case of Calvert Cliff's Committee v. Atomic Energy Commission, this balance is clearly described as follows:

"Environmental amenities will often be in conflict with economic and technical considerations. To consider the former along with the latter must involve a balancing process. In some instances environmental costs may outweigh economic and technical benefits and in other instances they may not. But NEPA mandates a rather finely tuned and systematic balancing analysis in each instance." 8

2. Necessary conditions

In order to achieve the goals described above, NEPA prescribes the preparation of EIS's, which is the only action required by the Act. However, there are several conditions necessary for the adequate preparation and review of an EIS.

These conditions are as follows:

a) Sufficiently detailed information must be available

As the base of the EIS, information about the existing situation, its trend and other proposed plans provides the foundation of any EIS. Based on this background, the impacts on the environment of the project can be assessed. But the standards for what constitutes required sufficient detail cannot be defined clearly. The amount of detail necessary depends on the specific project, time and cost allotted for the EIS study. Information that is too detailed may be unnecessary or useless. For example, the information about the existing situation of population or commerce is necessary, but too detailed a description of population such as the respective datum of ages or of commerce such as the amount data of selling is usually unnecessary.
The information used in an EIS should be screened according to priorities set by experts engaged in the EIS study, with consultation of all other concerned parties.

b) Sufficiently accurate assessments of consequence must be made

The impacts of a proposed project need to be predicted as accurately and objectively as possible. However, standards for sufficient accuracy have not been clarified. For example, the decrease of respective species plankton or bird caused by the project can be considered, but the assessment of the decreased species numbers is neither necessary nor possible in general. While mistakes in data analysis or impact assessment should of course be avoided, complete accuracy is not possible. The extent of the accuracy of an EIS also depends on the judgement of the experts, the concerned agencies and the public.

Moreover, the assessment of future impact involved, by definition, a degree of uncertainty. This uncertainty should be identified.

c) Sufficient complete set of alternatives must be presented

Choices are made at every stage of planning a project, including during the preparation and review of an EIS. With each important choice, a complete development of the choices is necessary: i.e. all the possible options or alternatives should be determined and explored. If this complete investigation of options is neglected, there is the possibility that feedback with the previous stage in the development process is necessary, when a concerned group finds an important missing alternative.
For example, in I-291 Why? Association v. Burns, the District Court accepted the plaintiffs' claim holding that "NEPA is not satisfied by DOT's EIS that inadequately considers alternatives to federal-aid highway project." However, as noted in the previous sections, the standards for completeness cannot be specified for all cases. For example, in Daly v. Volpe, the District Court held that "FHWA's I-90 project EIS that considers specific corridor alternatives and environmental impacts satisfies NEPA, even though it did not consider all possible alternatives."

d) Balanced evaluation of priorities must be made

The standards for sufficiency described in sections a, b, and c above are based on an evaluation of priorities. These priorities differ among concerned parties. In the planning process, it is necessary to articulate these priorities and then to try to gain a consensus or make a trade-off. H. Ellis and R. Keeney suggest a rational approach for government decisions concerning air pollution involving a step as follows:

"Prescribing the relative preferences of the public official for each possible consequence. Here, the trade-offs among the conflicting objectives are precisely identified."  

e) Interaction with the other agencies must be made

Any proposed project will come under the jurisdiction of other governmental agencies and thus interaction with these agencies is essential. This interaction is not limited to the EIS review process, but it also includes consultation meetings and workshops with these agencies.
Through this interaction, standards relevant to necessary conditions for an EIS can be delineated and made clearer.

f) Interaction with the public

As with interaction with other agencies, interaction with the public is requisite. In particular, highway projects affect the communities and citizens directly and/or indirectly. Furthermore, different people have different priorities, interests and values that must be considered during the EIS preparation and review processes. Interaction with the public can be attained through interviews, meetings, workshops, EIS comments and public hearings, etc. Through this interaction, the public and the agency administering the project can learn from each other and can reach the better decisions. Further, the public's trust of the agency can be better established through the interaction, especially if a "good faith" basis is established and maintained. However, there is a special problem that the people whose participation is necessary do not participate in the EIS process. For example, if each person's interest is very small, such a person will not participate, but when the total sum of such an interest becomes a great deal and there is no organization representing the interests, participation is necessary but difficult. In such a case, it is necessary to encourage participation or the administrative agency should represent the interests.

B. Evaluation of EIS process and the criteria of evaluation

1. Criteria
In order to evaluate the EIS process which includes the planning, location, design, and decision-making process, it is necessary to set criteria for evaluation based on the above necessary conditions. These criteria can be defined as follows:

a) Coordination with other agencies

As described above, it is necessary that the other federal, state, and local agencies participate in the EIS process in order to make the project optimal, according to their jurisdiction and expertise.

At the federal level, the EPA has expertise on matters concerning air quality, water quality, noise level and solid waste management, and it is also obliged to review and comment on the draft EIS, as mandated by Sec. 309 of the Clean Air Act. In addition, EPA order 1640.1 provides a rating system for EIS's. As to highway projects in particular, the EPA has published guidelines for the review of the relevant EIS's.

Other agencies, such as the DOI, HUD, HEW, and others relating to the project, need to be coordinated in order to avoid conflicts of varying national interests.

At the state level, the Massachusetts Executive Office of Environmental Affairs, the Massachusetts Department of Community Affairs, the Department of Natural Resources and so forth are relevant to a highway project. Further, in compliance with the Office of Management and Budget (OMB) Circular A-95, the State Clearinghouse within the Office of State Planning and Management and the regional planning commission(s) must review, comment and
redistribute the initial proposals for federal-aid projects to other interested state and local agencies for review.

At the local level, city or town agencies may represent their local interests reflecting the opinions of the citizens as well as their own agency's jurisdiction and expertise.

The interaction with these agencies supplements the NEPA requirement of a "systematic interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision-making which may have an impact on man's environment." (Sec. 102 (2) (A))

Although the review process of the draft EIS may require the greatest part of the coordination with these agencies, other contacts in the form of meetings, workshops, memoranda exchange, etc. cannot be ignored. In addition, early involvement of the other agencies will increase the efficiency of the project's development.

From these viewpoints, it is necessary to evaluate the EIS process by assessing how the coordination works and what the results of this coordination are.

b) Public participation

The constituent individuals or groups of the general public have different interests and values. Regarding highway projects, property owners on or near the proposed right of way will be affected directly, and some citizens or citizen groups may be concerned with the loss of natural resources such as wetlands, vegetations, etc.
Some businesses will want the highway project in order to save transportation time to their locations or to increase the demand for their services. Early articulation of these interests, priorities, and values is necessary to identify the issues and clarify the importance of the impacts. The knowledge of local citizens about the affected area based on their experience of living there sometimes can be useful in collecting data, assessing the impacts and finding alternatives. In addition, citizens can participate in the process and have a chance to have their opinions reflected in the project. The highway agency and the public can learn from each other through these interactions and thus can attain mutual goals. If the interests or priorities are in conflict, compromise or bargaining can be sought through the interaction between the highway agency and the public. The public's reliance on and trust of the highway agency can be maintained or restored by this establishment of communication. The EIS process should thus be evaluated in part by the assessment of the extent of and the manner in which public participation works.

c) Social equity

Highway projects are originally proposed with the aim of maximizing total net benefits. Thus the most adequate alternative, which is expected to maximize the benefits and minimize the adverse impacts, is supposed to be selected. However, the gained benefits are not necessarily allocated equally. Often interests are different and conflicting.
In that case, one (or several) party gains and the other(s) loses. Therefore, it is necessary to clarify who gains and who loses. Furthermore, compensation for those who lose needs to be considered.

Thus, the EIS process should be evaluated under the criteria of social equity.

d) Cost-effectiveness of the EIS process (Benefit)

It is very difficult to evaluate the EIS process by cost-effectiveness. Costs can be divided into EIS preparation, public hearing, public meeting, and review costs. These are direct costs and may be calculated, at least conceptually, on the basis of man-hours plus printing, distribution and travel costs, etc. However, increased project costs caused by the delay brought about by the EIS process, is more difficult to evaluate. (Project delay might be caused by public opposition even without the EIS process.) On the benefit side, one must consider what would result if the EIS process were not to exist. The EIS process can reduce the risk that the project might cause environmental adverse effects. But such a supposed result of the EIS process is only a possibility, and as yet the benefits cannot be identified clearly even "on the average".

Thus, an evaluation of the EIS process based on the cost-effectiveness is difficult. In a letter regarding NEPA-induced costs, the Comptroller General said:
"They (officials) stated that the costs of preparing environmental impact statements, ..., should be considered a part of good planning and included with project planning costs. ... 

Some officials expressed concern that if such costs were presented separately, they would become a target for reduction without adequate evaluation of the benefits derived from such costs. They stated that, although NEPA resulted in higher project planning and decision-making costs, no estimate was being made of the resulting benefits. They stated that the benefits could be substantial in terms of better planned projects which are more responsive to community needs and to the general public and in terms of the avoidance of environmental damage."12

Thus, the EIS costs must be considered at least conceptually in terms of the benefits resulting from better planned projects.

These costs cannot be identified in this paper since the data are not available, thus a cost-effectiveness study cannot be done. Therefore, this paper deals with what benefits result through the EIS process. Although it is difficult to attribute the beneficial result only to the EIS process, this assumption is possible to defend.

e) Objectivity and adequacy

Defining objectivity under value judging circumstances is difficult. Nevertheless, in the case of National Helium v. Morton, the U.S. Court of Appeals held that:

"The better reasoned decisions have required an objective good faith effort to comply with the statutory procedural requirements. Other than that the courts have demanded that the agency do more than mechanically pursue the procedural standards. ... The rule of reason is a more appropriate standard where the sufficiency of the statement is being tested."13
Thus, the decisions contained in an EIS must reflect objectivity based on the rule of reason. In the EIS process, "adequacy and completeness" should be pursued but not "perfection". Thus, in order to assess the adequacy of the EIS process, objectivity can become a criterion.

2. Evaluation of the three cases' EIS process

a) Amherst bypass project

   i) The development process of the Amherst bypass EIS

   The Amherst bypass case is very unusual in terms of its project's initiation and the decision making process involved. The project was initiated by the Town of Amherst and the authority for decision making was given to the Town by the DPW. From this point of view this case can be seen as an experimental model of citizen participation and local initiative planning. The development process of this bypass project is outlined in Table IV-1.

   Originally, the necessity of the new bypass was recognized by the Town. The Town Meeting approved the Joint Town-University Task Force Report recommendations for a bypass in 1969. The DPW was then asked to make recommendations, and a public meeting was held, during which Alternate I was presented by the DPW. The Town Meeting did not approve this plan and instead created a Traffic Circulation Committee (TCC) to further study this issue. Subsequently, the TCC hired two consultants to study both alternative plans and the environmental effects. Based on these two reports, the Town Meeting approved Alternate IIA, but because of the uncertain location of the southeastern terminus, the Town Meeting requested the DPW to study this problem further and to submit alternatives to the Town.
TABLE IV-1 Development Process of Amherst Bypass Project

<table>
<thead>
<tr>
<th>Date</th>
<th>Other Agencies</th>
<th>FHWA</th>
<th>DFW</th>
<th>Consultant</th>
<th>Town of Amherst</th>
<th>Univ.</th>
<th>Public</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug.1968</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Joint Task Force</td>
<td></td>
<td></td>
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<tr>
<td>Jan.1969</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Report</td>
<td></td>
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<tr>
<td>Mar.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Town Meeting</td>
<td></td>
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<tr>
<td>Oct.1970</td>
<td></td>
<td></td>
<td></td>
<td>Alternate I</td>
<td>Public Meeting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan.1971</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Town Meeting</td>
<td>vote against the DPW's Alt.I</td>
<td></td>
</tr>
<tr>
<td>Jun.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Traffic Circulation Committee</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jan.1972</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Delegation of EIS to Bayside</td>
<td></td>
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<tr>
<td>Jun.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Meeting with Town officials</td>
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<tr>
<td>Aug.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Public Meeting (terminus alternatives)</td>
<td></td>
<td></td>
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<tr>
<td>Sep.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Public Meeting (environmental impacts)</td>
<td></td>
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<tr>
<td>Oct.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Town Meeting (decision of Alternate IIA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nov.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Publication of Draft EIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aug.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Town Meeting (decision of Alternate IIC)</td>
<td></td>
<td>Approval</td>
</tr>
<tr>
<td>Oct.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Town Meeting (decision of Alternate IIC)</td>
<td></td>
<td>Approval</td>
</tr>
<tr>
<td>Nov.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Final EIS</td>
<td></td>
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<tr>
<td>Mar.1974</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Approval</td>
<td></td>
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<tr>
<td>Jul.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Approval</td>
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</table>
The EIS study was then contracted out to a consulting firm. In June and August, 1972, several meetings concerning the location of the eastern terminus were held between the state, town officials and the consulting firm. In September, 1972, a public meeting concerning terminus alternatives was held, and in the following month a public meeting concerning environmental impacts was held. In November, the Town Meeting voted to approve Alternate IIA. The draft EIS recommending Alternate IIA was published in March, 1973. In August, a public hearing was held concerning the draft EIS. Two months later, a special Town Meeting rescinded its vote favoring Alternate IIA and instead approved Alternate IIC. Thus in March, 1974, when the final EIS was published, Alternate IIC, as decided by the Town Meeting, was recommended.

ii) Coordination with other agencies

Highway projects in Massachusetts are usually planned, designed, and implemented by the DPW. In the case of federally aided highways, the FHWA supervises the DPW, but the DPW executes the project and has direct responsibility for it. Therefore, the coordination between the DPW and the other federal, state, and local agencies must be evaluated here. In this case, however, the Town of Amherst itself led the project development; the project was initiated by the Town and the Town Meetings made the decisions concerning the project which the DPW approved. From this standpoint, the coordination between the DPW and the Town is evident:
At least five Town Meetings were held concerning the project, and the TCC, which was created by the Town, communicated well with the DPW. However, several problems remained.

The first problem was the DPW's proposal of Alternate I at the first public meeting in 1969. Perhaps because this proposal was based on the decision of the previous Town Meeting and the NEPA requirement of an EIS had not been enacted yet, the DPW neglected to consider the alternatives.

The second problem was that the EIS study began after the route alternatives and environmental impacts studies had been done by the consulting firm originally hired by the town. Sufficiently early consideration of alternatives is one of the essential requirements of the EIS process, but in this case the timing of the EIS was a little late. If the EIS had been initiated before the two studies, the alternatives studied might have been efficient and accurate. On the other hand, the consultant's studies possibly convinced the town that the proposed alternatives were sufficient, and also may have eliminated unnecessary consideration of alternatives and afforded the introductory knowledge of environmental impacts prior to undertaking the EIS study.

The third problem was that the Town Meeting in November, 1972 choose Alternate IIA before the draft EIS publication. This means that the decision was made without the exact information on environmental impacts.
The final problem was that the DPW accepted the Town Meeting decision in favor of Alternate IIA and the draft EIS was also based on this decision. Although the DPW officials and the consulting firm respected the Town Meeting's decision, there remains the possibility that they abandoned their responsibility or expertise by not taking part in the decision making process and not recommending Alternate IIC. (Alternate IIC may objectively be more appropriate than IIA and this objectivity will be discussed later.)

In spite of the above problems, the Town of Amherst was eager to reach the optimal solution and the DPW supported the Town. Thus the coordination between the DPW and the Town can be evaluated as excellent.

However, the same evaluation cannot be given concerning the coordination of the DPW with the other agencies involved in the review process of the EIS. Only the Soil Conservation Service was contacted to get the information on soil condition before the draft EIS publication. Contact with the Amherst Historical Commission and the Lower Pioneer Valley Regional Planning Commission was made only because of suggestions in the comments. In response to the various agencies' comments, the EIS study was improved. Major improvements were the air quality impact assessment using the California model suggested by the EPA and the indirect impact assessment addition indicated by the DOI and the Lower Pioneer Valley Regional Planning Commission.
iii) Public participation

The participation of the Amherst Town Meeting in this project can be seen as a model of public participation, since the Town Meeting consists of 250 members who are representatives of the citizens of Amherst. The Town Meeting can also be regarded as one political unit that has influence and power and has often been categorized as a local government. In addition to the Town Meetings, general public participation was accomplished through three public meetings, one public hearing, and the review of the draft EIS. Moreover, it is noteworthy that a few months after each public meeting or public hearing, a Town Meeting was always held and a decision was made. Thus, public opinion was organized dynamically and systematically. The way this public participation mechanism, including the Town Meeting, worked and its results are summarized below.

The first result was the consensus concerning the need for the bypass. The Joint Town-University Task Force, the Town Meeting's approval of the Task Force's report, and the Public Meeting held by the DPW, all helped the citizens of the town to reach the consensus that the bypass was necessary for the town.

The second result was that the priorities for the major alternatives were identified. Based on the two reports of alternatives and environmental impacts (both of which were published prior to the EIS), the town set criteria concerning the number of users, the level of service, environmental damage, and limitation of access to the bypass.
Among the several alternatives Alternate IIA was selected, although selection of its terminus was suspended.

Although the decision regarding the terminus alternatives was confused and changed the trade-off relationship between the two terminus alternatives, the priorities in reference to the adverse impacts were recognized and ultimately the decision was made. This was the third result.

As an additional result, the construction of a bicycle path was decided in compliance with the request of the Bicycle Paths Committee.

This public participation has some limitations, being used primarily by the townspeople, except for two farmers and a realtor. These latter individuals did not live in Amherst, but their interests related to the project. However, this limited public participation may not be a problem since the public who are concerned with the project did participate and the scale of the bypass project is only town-wide -- so small that the bypass will probably not affect individuals outside the Amherst area.

iv) Social equity

At the end of the process, Alternate IIC had been decided as the final selection. The residents near Alternate IIC had opposed this choice and were unhappy when it was chosen. Generally, no one wants a highway near him. The EIS states that Alternate IIC will have no noise impact on the residents except the existing impacts and the noise reduction measures, such as barriers plantings will be designed.
However, aesthetic deterioration may still exist. The users of the bypass, mainly commuters to the University, gain the benefits of the bypass. On the other hand, the residents near Alternate IIC experience the negative benefits. If Alternate IIA had been selected, the residents and the school near Alternate IIA would suffer. And if the bypass were not to be built, the town center and the residents near the existing commuting roads would suffer from the congestion.

How can this problem of inequity be solved? One way is to compensate the sufferers. The sufferers who will be affected by the project should be given just compensation for their suffering. But in this case, the unhappiness of the residents cannot be easily remedied by money. At least there is no legal or political means to remedy.

v) Benefits

Although Alternate IIC has disadvantages such as its impacts on the nearby neighborhoods and the increase of intersections, it was judged as better than Alternate IIA which would have affected the neighborhood, historic area and elementary school. It is not clear whether Alternate IIC would have been selected if the EIS had not existed. But considering that before the EIS study began, Alternate IIA had been approved and that during the draft EIS study, Alternate IIA was approved, Alternate IIA may well have been selected if the EIS process had been required.
After all, the selection of the most suitable alternative location that was agreeable to most parties is a clear benefit of the EIS process in this case. Another important benefit is the recognition that the people of a town like Amherst could cooperate and plan a highway project like the bypass.

vi) Objectivity

Another issue that must be considered is whether the choice of Alternate IIC was made objectively. The disadvantages of Alternate IIA were danger to the children of the Fort River School, negative impacts on East Street Common historic area, and negative impacts on the neighborhood on East Street. The disadvantages of Alternate IIC are the negative impacts on the neighborhoods of Salem Street and Shumway Street and the increase of intersections (the terminus does not connect to Belchertown Road directly). While both of the two alternatives had disadvantages, the less harmful alternative should have been selected. There are good arguments that Alternate IIC is the less adverse alternative if historical value and safety of children is taken into account. On these grounds, the special Town Meeting in October, 1973 reached the more appropriate decision, one which corresponded with the recommendations of the town planner and of the TCC, and with the comments of the DOI and the Public Schools of Amherst.
If the Town Meeting's original choice of Alternate IIA was not optimal from the standpoint of the impacts discussed above, then the acceptance of the DPW and of the consulting firm of the Town Meeting's decision may indicate a deficiency in the responsibility or expertise of these two groups, even though they respected the Town's authority.

A principle obstacle to objectivity, at least in theory, was delegation of both the EIS and the design of the construction to the same consulting firm. This situation points to the problem of a conflict of interest. This problem was commented upon by the Massachusetts Department of Community Affairs and the Lower Pioneer Valley Regional Planning Commission. This is discussed later.

b) I-190 project

i) The development process

The history of this highway project development and of the decision making process related to it is long and complicated, (see Table IV-2). The division of the planning segments in the corridor was changed as the project developed. This project began with federal approval to commence preliminary engineering in 1958. In 1967, Governor Volpe announced the proposed plan for Route 52. In 1968, Location Public Hearings were held for the selection between I-290 in northern Worcester and the Sterling-West Boylston town line. Two alternatives, i.e. the West and East Alternates, were proposed by the DPW, (Figure IV-1).
A new alternative (the Burleigh Alternate) was suggested by other interested parties. In December, 1969, Location Public Hearings for the remaining section between Sterling and Leominster were held. In 1970, Design Public Hearings for the section between Worcester and West Boylston were held during which the DPW presented design details of the modified easterly alignment from I-290 to Route 140 near the Wachusetts Reservoir (Figure IV-2). The DPW judged that there were no significant objections to the section of Route 52 in West Boylston, but decided that new alternates should be studied for the Indian Lake section in Worcester. As a result, the draft EIS for the Indian Lake section was prepared and presented at the Public Hearing in March, 1971. Four alternatives for this section were presented. (Figure IV-3) The majority of the public and other agencies favored Scheme III which was viewed as least harmful to the lake. The EIS for the remaining northern section in Worcester was authorized in August, 1971 and the draft EIS was published in October, 1972. A public meeting to discuss environmental concerns was held in December, 1971. In February, 1972, two community workshops were conducted on the subject of the entire expressway route between I-290 and Route 2. Then, in May, 1972, the writing of an EIS for the segment from West Boylston to Leominster was authorized. In December, 1972, the draft EIS was published. It recommended two alternatives, the Far West Alternate and the Hearing Design/East Alternate Bypass, (Figure II-3).
TABLE IV-2 Development Process of Route 52 Project

<table>
<thead>
<tr>
<th>Date</th>
<th>Other Agencies</th>
<th>FHWA</th>
<th>DPW</th>
<th>Consul. Worcester</th>
<th>West Boylston</th>
<th>Sterling Leominster</th>
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PROPOSED LOCATION OF
ROUTE 52
IN
WORCESTER - HOLDEN & WEST BOYLSTON

FIGURE IV-1 1968 Hearing Plan of Route 52
Source: Final Environmental/Section 4(f) Statement for Route 5 Expressway
FIGURE IV-2 1970 Hearing Plan of Route 52

Source: Final Environmental/Section 4(f) Statement for Mass. Route 52 Expressway
FIGURE IV-3  Location Alternatives of Route 52  
(Indian Lake Segment) 

Source: Final Environmental/Section 4(f) Statement 
for Mass. Route 52 Expressway
Public Hearings concerning this EIS were held in February, 1973. In June, 1973, the final EIS for the Worcester segment, which unified the two segment draft EIS's, was published. Scheme IV-A was selected for the Indian Lake section in Worcester. In December, 1973, the final EIS for the northern segment from West Boylston to Leominster was published, recommending the Far West Alternate. After the publication of the final EIS, a Sterling citizen group brought a law suit against the DPW. A preliminary injunction was denied in 1974. In addition, the Town of West Boylston opposed the Far West Alternate and recommended a new alternative, the 1974 A Plan. The Town of Sterling also opposed the Far West Alternate and recommended another alternative which detours the town. (Figure II-3)

ii) Coordination with other agencies

Before the preparation of the EIS, information on the relevant historical sites was given to the DPW by the Massachusetts Historical Commission. In addition, contact was made with Metropolitan District Commission concerning Wachusetts Reservoir crossing, since the Reservoir is the source of the Boston Metropolitan District water supply. The MDC had already approved the plans for Route 52 to cross over the Wachusetts Reservoir in June, 1970. However, the problem of a new highway crossing the reservoir was the great concern before the draft EIS publication. The DPW coordinated the input of the MDC, the Massachusetts Executive Office of Environmental Affairs, the Department of Natural Resources, the Department of Public Health, and the EPA by holding several meetings concerning the Reservoir.
Ultimately, the Hearing Design/East Alternate Bypass, which crosses the Reservoir, was not recommended in the final EIS. Certainly, the opposition of these agencies to that alternative because of the public health hazard caused by the potential for toxic spills and lowering of water quality strongly affected the final decision.

In addition, contact with the U.S. Soil Conservation Service, the Massachusetts Department of Community Affairs, the Central Massachusetts Regional Planning Commission, and the Massachusetts DPH, etc. was made in order to get information concerning soils and geology, municipal and private wells, and so on. Coordination with local agencies must have occurred but is not well documented even though their opinions are defined in the comments to the draft EIS.

Regarding the Worcester Segment EIS, the DOI, the Mass. Division of Water Pollution Control, the DNR, the Department of Commerce, the Division of Fisheries and Game, and the Water Resources Commission, etc. all supported Scheme III which affects Indian Lake the least. However, Scheme IV-A was selected, and the reasons of this decision are not explained clearly in the final EIS. From the viewpoint of coordination with other agencies, the process by which the final decision was made should be reconsidered. Guidelines that clarify whether the EIS satisfactorily responds to comments should be established.

The draft EIS stated that Indian Lake has already begun to deteriorate even without the construction of the highway because it is a highly biologically productive lake.
The EIS also pointed out that the consultant's survey showed that the water quality of Indian Lake is lower than Class B (suitable for bathing and recreational purposes including water contact sports acceptable for public water supply with appropriate treatment; etc.). But the EPA, the Mass. Water Resources Commission, and the Division of Fisheries and Game rebutted the EIS statements and finally it was universally agreed that Indian Lake was a valuable resource to the community and that every effort must and would be made to maintain the Class B water quality of the lake. This agreement was the result of good coordination between agencies.

As to the segment from West Boylston to Leominster, the comments of the other agencies opposing the alternative that would have crossed the Reservoir affected the final decision against the Hearing Design/East Alternate Bypass. Local agencies do not want a highway that affects their jurisdictions adversely, especially in terms of neighborhoods. Thus, the towns of West Boylston and Sterling recommended the easterly alternative rather than Far West Alternate. Likewise, the town of Holden strongly endorsed Far Easterly Route, and also did not oppose the Far West Alternate which bypasses the neighborhood of Holden. The alternative supported by West Boylston and Sterling was not chosen. After the publication of the final EIS, the two towns proposed other westerly alternatives not included in the EIS. The 1974 A Plan proposed by West Boylston is a revision of the Far West Alternate segment in West Boylston.
The DPW and the town of West Boylston negotiated and reached the agreement to move the Far West Alternate a little more to the west. This revised alignment will bypass the previously affected neighborhood although the efficiency of the road will decrease due to a sharper curve and to an increase of undulations. Nevertheless, Fran Bruno, a DPW official* said that the alternative proposed by Sterling is too long and too far from Clinton where population concentrates, and also that it passes through environmentally sensitive areas. Bruno said further that for these reasons the alternative was not included in the EIS, although it had been considered. Thus, the confrontation between the DPW and the town of Sterling remains. The proposal of new alternatives by Sterling and Boylston may indicate that the alternative selection process was not sufficiently coordinated between these towns and the DPW, even though the two workshops were held and alternatives were discussed. However, rather these proposed alternatives seem just tactics of the towns, because perhaps no highway would please them.

iii) Public participation

Location and design public hearings for the Worcester segment of Route 52 were held before the EIS study was undertaken. Several meetings of the DPW, public officials, and industrial committees and citizen's groups were held and three alternatives were developed as a result of these meetings.

* Interview with Fran Bruno, DPW.
In the comments about the draft EIS for the Worcester segment, the Worcester Area Chamber of Commerce urged the construction of Route 52 without further delay, arguing that the depressed economic condition in Worcester could be cured by rapid construction. The Worcester County League of Sportsman's Clubs supported Scheme III, but after these comments, the DPW made contact with the League, and Scheme IVA was agreed upon.

Location hearings about the northern segment of Route 52 from West Boylston to Leominster were held before the EIS study was started. After that, one public meeting, two community workshops and public hearings for the EIS were held. The two workshops were effective because the other alternatives that the public had requested were considered and presented. However, the communication between the DPW and the public about the alternatives was not so good; the two towns proposed two additional alternatives after the final EIS had been published. During the study of the draft EIS, public meetings were not held and other major contact with the general public was not made, although two workshops and a public meeting had been held before the authorization of the EIS.

In the comments about the EIS for the northern segment various opinions were expressed by citizens and groups. Affected residents expressed their concern or opposition to the alternative which would affect them. Some citizens stated that the new highway was unnecessary.
The Clinton Area Chamber of Commerce and the Worcester Area Chamber of Commerce support the rapid completion of Route 52. In the Public Hearings, members of the General Court expressed their concern for getting the project started as soon as possible and mentioned the dire economic impacts on the areas that would occur if the proposed highway were not built. Thus, those individuals and firms that gain benefit from the project are represented through intermediaries. Most of the public's concern as expressed in the comments and at the public hearings was about the adverse impacts of the project on their interests. Therefore, if one alternative route is decided upon and the affected parties are identified, the major issue is then how to convince them not to oppose the proposal. With this perspective, perhaps the responses to the comments on the EIS may not have been adequate.

iii) Social equity

If the recommended alternative Scheme IV-A is implemented, then one elementary school, YMCA property, part of the recreational land surrounding Indian Lake, some industrial land, 16 businesses, and 74 dwellings must be taken in Worcester. The school would be moved to a new facility and a one-half acre "mini park" would be built on the YMCA property. Relocation of the families would be undertaken under the Conceptual Stage Relocation Plan. For the northern segment from West Boylston to Leominster, 42 families and six businesses would be relocated, ten farms would lose all or part of their acreage, and one orchard would be taken.
Those individuals so affected would, of course, receive compensation. However, those people who are accustomed to the life they had before Route 52 was constructed may suffer more or less from their relocation. Besides, the residents near the new highway suffer air and noise pollution. On the other hand, the benefits brought about by the highway are: 1) safe and efficient transportation and 2) regional development. The new highway might contribute to the economic growth of the region. The Worcester and Clinton Chambers of Commerce expressed their desire that the Route 52 be constructed as soon as possible so as to revitalize the economy. However, if the economy were to improve, there is no assurance that the allocation of the new benefits would be distributed fairly.

iv) Benefits

Due to the EIS process, the Hearing Design/East Alternate Bypass was not selected. If there had been no EIS process, the Hearing Design/East Alternate would have been selected, since it does not pass near the town centers of West Boylston or of Sterling, and it is also convenient to Clinton. However, the MDC and other agencies concerned about the toxic material spill into the Wachusett Reservoir, the water supply for the Metropolitan Boston Area, affected the decision strongly, although the existing Route 12 crosses over the Reservoir. Thus, some hazard to the Boston Area was avoided and Scheme IVA, which costs least and takes less industrial land than Scheme III, was decided upon and the water quality of Indian Lake will be maintained.
Some of the communities' comprehensive plans are not updated from the viewpoint of new regional relationships and potentialities brought about by the new highway and have to be reexamined. Therefore, the I-190 EIS provides a chance for the communities to update their plans. In order to gain maximum benefits and to minimize harm, the plans should be revised. Affording such a chance is secondary benefit of the EIS process.

v) Objectivity

The EIS process of I-190 (Route 52) included fragmentation of the proposed highway. At first, location public hearings were held for the segment between Worcester and West Boylston. The segment for which design public hearings had been held was reduced in size. The first draft EIS was prepared for the most controversial section of Indian Lake. The second draft EIS for the segment from north of Indian Lake to the Holden-West Boylston town line was prepared one and a half years later. Then at last, the draft EIS for the remaining segment from West Boylston to Leominster was published in two volumes. The most urgent segment was separated from the rest of the project and then the three EIS's were also prepared separately. Several cases apply to this problem of fragmented EIS's. In Indian Lookout Alliance v. Volpe, the Court of Appeals held that:

"NEPA permits division of federal-aid highway project into segments for purposes of preparing EIS's, but each segment for which a statement is prepared must be long enough to possess an independent utility of its own and must end in logical terminal points, such as present major highways or cities."
In the case of the Conservation Society v. Secretary of DOT, the District Court in Vermont opposed the separation saying that:

"Preliminary planning by Connecticut, Massachusetts, and Vermont concerning overall improvement of existing federal-aid highway route requires FHWA's preparation of EIS to assess overall impacts of improvements in addition to Highway Administration's preparation of statements concerning each state's individual project segments."\(^{15}\)

However, in Citizens v. Brinegar, the District Court held that:

"Federal and state highway agencies' reasonable division of federal-aid highway project into individual segments and their preparation of separate EIS's for each segment do not absent allegation that division was made clandestinely to avoid statutory requirements, violate NEPA."\(^{16}\)

In the case of Committee to Stop Route 7 v. Volpe, the District Court held that the "requirement is not satisfied by impact statements issued separately for each individual project segment of proposed highway."\(^{17}\) In the case of Thompson v. Fugate, it was decided that:

"Federal and state highway officials cannot divide 29 mile federal-aid highway project into separate 8 and 21 mile segments for the purpose of assessing project's environmental impact, but must consider entire project's impact."\(^{18}\)

The decision to divide the EIS for a proposed highway depends on the project, but any division which causes the inadequate consideration of alternatives and impacts does not satisfy the requirement of the NEPA. From this standpoint, the EIS for the Route 52 project cannot necessarily be considered illegal because at least the attempt was made to unify the EIS's and to find alternatives to and impacts for the whole corridor.
Nevertheless, the extent of this unification seems insufficient.

The second problem is the delegation of both the EIS and the design to the same consulting firms. This is criticized as a conflict of interest in the comments. For example, the draft EIS tended to justify the construction of the highway and underestimated the negative impacts on the water quality of Indian Lake and the Nashua River. Although this was revised in response to the comments, there remains some doubt about objectivity of the consultant and the DPW.

The third problem is the objectivity of the decision. If it is agreed that the highway is necessary and that there are no alternatives worthy of consideration other than the Far West Alternate and the Hearing Design/East Alternate Bypass, the choice of the Far West Alternate may be reasonable, as the other agencies opposed the Hearing Design/East Alternate. Moreover, the Far West Alternate requires the least relocation. However, the compromise between the DPW and the town of West Boylston indicates that the DPW inclined to weigh technicality about serviceability of the road as more important than affected residents.

c) I-95

i) Development process of I-95

The flow chart of the I-95 project process is shown in Table IV-3. The existing highway was constructed in the early half of 1950's. On grounds of the insufficient road capacity and the deficient structure, highway improvement was planned by the DPW, and preliminary studies began in 1965.
The studies concluded that the existing highway should be widened from four lanes to eight lanes. In 1968, public hearings were held, and in 1969, the improvement plan was approved by the DOT. Then, NEPA was enacted and it was decided that an EIS for the I-95 project was necessary. During the draft EIS study, several meetings with the consultant and with local officials were held as well as several public meetings. The draft EIS was published in December, 1972. After the review, the final EIS was approved by the FHWA in March, 1973. A citizen group, the Essex County Preservation Association, which consists of members of the West Newbury Conservation Commission and citizens of Topsfield, brought a law suit seeking a preliminary injunction against the DPW. The District Court denied this request and the plaintiffs are now seeking a permanent injunction.

ii) Coordination with other agencies

At the federal level, during the draft EIS study, a meeting with the EPA, the FHWA, the DPW and the consultants was held concerning the progress of the study and the scope of the work. Coordination with other federal agencies was limited to the review of the draft EIS.

During the draft EIS study, mainly from June to August, 1972, the consultant met the relevant local officials; in most communities, meetings were held with the Mayor, Selectmen, Police Department, Fire Department, Public Works Department, School Officials, Regional School Authorities, Planning Board, Conservation Commission, Industrial Development Commission, Redevelopment Authority, Hospitals, Board of Health and Historical Societies.
### TABLE IV-3 Development Process of I-95 Project

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<tr>
<th>Date</th>
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In addition, a meeting with the DNR was held. The purpose of these meetings was mainly to collect information. Concerning the Section 4 (f) lands, the DNR, the Division of Fisheries and Game, the Newburyport Conservation Commission, and the West Newbury Conservation Commission were asked if the project would affect these lands significantly, and they answered that it would not.

iii) Public participation

Although the public hearings held in 1968 preceded the writing of the EIS, the fundamental requests of the communities affected were presented at that time. During the EIS study, a meeting with the interested citizens and neighborhood groups in Boxford was held. Other public meetings were held before the draft EIS was published. At these meetings, the four alternatives were presented and discussed. After the draft EIS was published, however, there were no public hearings or meetings held. Thus, the public had a chance only to comment in writing on the draft EIS. Most of these comments mentioned noise impacts and salt effects on the wells or the fear of water quality deterioration of rivers and wetlands. In response to these comments, a closed drainage system, noise barriers and a design change of the Newburyport intersection from a clover-leaf to a diamond were devised. However, the comments about property value decrease were not responded to.

The citizen group, Essex County Preservation Association brought a suit, claiming the following issues:
* No Action Plan was prepared before federal funding was approved.

* Material factual changes had occurred necessitating a supplement to the impact statement.

* The impact statement was self-justifying after the fact and was written by the wrong part.

* The impact statement as drafted was an inadequate document.

These claims were based on various legal issues, but the primary concern was the loss of the Section 4 (f) lands. One of the plaintiffs wrote:

"As early as May, 1971, as chairman (I still am) of West Newbury Conservation Commission, I was concerned about town conservation land that would be taken before construction began. ... Until November, 1973, the Conservation Commission's concern was limited to the loss of this 4 (f) lands."19

During the EIS process, the points raised by the Preservation Association about the EIS were not responded to and they began to distrust the bureaucracy.* Finally they found that they had no recourse except the courts. Thus, at least for the plaintiffs, interaction with the DPW was not adequate.

iv) Benefits

As a result of the review process, three major changes were brought about. As described above, the three changes are a closed drainage system, the design change of the Newburyport intersection from a clover-leaf to a diamond, and noise barriers.

* Personal interview with P. Haac, December, 1974.
These measures to minimize the adverse impacts are large benefits resulting from the review included in the planning process. However, lack of communication concerning the need for the highway, and the general communication gap between the DPW and the citizens, has caused a law suit as well as distrust of the integrity of the DPW and the bureaucracy.

v) Social equity

In the case of I-95, there are families to relocate, as well as residents near the new highway who will suffer the impacts of noise, air pollution and aesthetic deterioration. Other individuals are concerned about the loss of wetlands. In addition, recreational areas such as the Georgetown-Rowley State Forest, the Downfall Wildlife Management Area, and the Newburyport City Forest, will lose a part of their area, although the administrative agencies responsible for them admit that the impacts are insignificant. On the other hand, the I-95 improvement will be most beneficial for the tourist users, because the main purpose of the project is to alleviate the peak congestion caused by tourist traffic. The people in the corridor itself will gain to some extent from the convenience and the region will be encouraged to develop. Thus there is a discrepancy between the beneficiaries and the sufferers.

vi) Objectivity

The EIS was delegated to the same consulting firm that was also responsible for the design. This again indicates a conflict of interest as the plaintiffs of the suit point out.
This problem will be discussed later.

The draft EIS underestimated the noise impacts and insisted that only 35 of the 300 affected residences would require measures to minimize the noise impact because the other 265 were already impacted by the existing highway. This justification of existing noise impacts may damage the consultant's credibility, although it does not prove that the EIS was not objective.

Judging from the initial planning process, it is fairly clear that the improvement plan was decided prior to the drafting of the EIS. Thus the objectivity of the decision to improve the existing route is somewhat questionable, but since the EIS study examined alternatives, it cannot be proved that the EIS lacks objectivity.

3. Further discussion of the problems of the three case studies.

a. Delegation of EIS

In all three cases, the EIS's were delegated by the DPW to the same consulting firm that had been given contracts for the construction design. The delegation of both EIS and the design to the same firm has been criticized as a conflict of interest. Prior to discussing this problem of delegation, it is necessary to examine the primary delegation of the EIS from the FHWA to the DPW.

Originally, the provisions of NEPA prescribed that the federal agencies prepared EIS's for their actions.
However, PPM90-1 ordered that the EIS for highway projects prepared by the State Highway Agency in consultation with the FHWA. Thus, the FHWA sanctioned the delegation of the EIS to state highway agencies. Nevertheless, in the case of Greene County Planning Board v. Federal Power Commission, the U.S. Court of Appeals held that the FPC's use of the applicant's environmental report rather than an EIS prepared independently by its own staff violated the policies of NEPA.

In highway project court decisions, there are two kinds of decision. One holding admits the delegation of the EIS from the FHWA to state agencies. For example, in the case of Iowa Citizens v. Volpe, the U.S. Court of Appeals held that:

"NEPA is satisfied by FHWA's review, modification and adoption of federal and highway project's EIS that was initially prepared by state highway agency."21

Examples of similar decisions are the cases of Fayetteville Area Chamber of Commerce v. Volpe, Swain v. Brinegar, Louisiana Environmental Society v. Brinegar, Movement Against Destruction v. Volpe, and Citizens Environmental Council v. Volpe, etc.24 25

The second kind of decision is represented by cases in which the decisions do not consent to an EIS written by the state highway agency. In the case of I-291 Why? Association v. Burns, the U.S. District Court held that:

"Federal-aid highway's environmental impact statement that was written wholly by Connecticut Department of Transportation merely ratified by U.S. DOT does not satisfy NEPA."9  

(emphasis added)
In the case of Conservation Society v. Secretary, the District Court decided that:

"EIS that was prepared by Vermont Highway Department and merely reviewed by FHWA does not satisfy NEPA, since NEPA requires direct preparation rather than perfunctory review by the concerned federal agency."16 (emphasis added)

Thus the court decisions on this point are contradictory. However, if the latter decisions can be interpreted as requiring at least active participation and strict review by the FHWA, then delegation to the state agency or a private party may be fundamentally allowed within the federal agency's responsibility. In actual practice, the state highway agencies have primary responsibility for planning, designing, and implementing highway projects while the FHWA only supervises the state highway agency, and thus the DPW's preparation of EIS's is preferable to the FHWA's.

The second problem concerns delegation of the EIS to consulting firms. Generally, the use of consulting firms is effective when these firms have expertise in environmental studies. Nevertheless, in the three cases we are considering, the delegation of both design and the EIS to the same consulting firm is reproached by some agencies and citizens as a conflict of interest. Certainly such an arrangement raises the fear that the consulting firm may be inclined to recommending the alternative that is most beneficial to the firm. For example, the firm may be thought to underestimate the benefits of a no-build alternative since it will not bring any design work.
The chance of this danger occurring is related to the expert's perceived morality or professional ethics. Further, if the consulting firm fails to correctly assess the impacts for whatever reason, their reputation and the trust of the public would be damaged. Rather the relation with the client may be more important to the consulting firms than immediate profit.

Regarding supervision, the FHWA's Rules and Regulations provide that:

"Work by consultants on environmental studies and reports leading to a project decision should be carefully reviewed to insure that complete and objective consideration is given to all relevant project impacts and alternatives. This is particularly important when the same consultants may be involved in subsequent phases of the highway section development".26

Thus, the problem is whether the DPW and the FHWA can supervise the consultant effectively. Moreover, the delegation of the EIS and the design to the same consulting firm has advantages in that the basic information and data are available for the two purposes, the design can reflect the environmental considerations, and also environmental concerns can be assessed and balanced with technical considerations. Therefore, efficiency and assessment of feasibility in the drafting of the EIS study and in design may be expected for projects that use one firm for both the study and the design.

Another aspect of this problem is that in the EIS's there is an inclination to admit the existing deteriorated noise level or water quality and then to justify constructing the highway on this basis.
This inclination may be caused by the conflict of interest described above, or it may be caused by the intention of the DPW since, as a state highway agency, the DPW has the purpose of constructing and maintaining the highways. As long as the highway projects do not affect the environment significantly, the DPW wants to construct the highways, depending on the need. Traditionally environmental or social concerns have not been centered in the highway agencies. Moreover, these three projects had been begun prior to the enactment of NEPA, and therefore, the spirit of NEPA might not necessarily be completely fixed in the minds of DPW officials. The inclination of the DPW to indiscriminantly promote highways might affect the consultant's attitude.

b. Decision making, consensus and public participation

Among the three cases discussed in this thesis, the Amherst bypass location decision was unique because the Town Meeting decided the location, although the DPW and the FHWA approved it. Thus that project was like a referendum and it can be seen as a successful example of public participation in planning, even though there was some confusion because of the deficient timing of a decision and a lack of guidance from the DPW. The chosen alternative in the Amherst bypass case seems to approximate consensus, since to date there has been no opposition, although the residents near the chosen location are unhappy.
The main reasons that a consensus was reached in the Amherst bypass case are the following:

i) The scale of the project is so small that the citizens understand the project.

ii) The necessity of the new bypass was widely recognized and a consensus about this necessity was attained among most of the citizens.

iii) The trade-offs between Alternates IIA and IIC were clearly identified and the priorities among the impacts were agreed upon throughout the process.

iv) Above all, the process involved local initiative and citizen participation and the decision was entrusted to the Town Meeting.

Compared with the Amherst bypass case, the other two cases are larger in scale and the interests that conflict are complicated. Although the conflicts may be unavoidable by nature, the processes of these two projects deserve further consideration.

The Route 52 project and the I-95 project were initially planned by the DPW more than ten years ago. Originally, a project is planned, since the benefits of the project exceed the costs of the project. In the two cases, the DPW considered that the projects were worthy to implement because the benefits which were safe and efficient transportation and regional development would exceed the costs from the viewpoint of the state. However, while the project is beneficial from the state viewpoint, it is not necessarily beneficial to some communities, groups, or individuals.
Their disadvantages will be included in the costs of the project. Here, benefits and costs include non-pecuniary values or every interest is assumed to be expressed in benefits or costs. When the DPW expects that the benefits/costs ratio of the project exceeds one, the project begins to develop. However, costs and benefits evaluated by the DPW should be confirmed or examined by the public. Various interests of the public should be included in the benefits and costs appropriately and also the benefits and the costs of the project should be sufficiently recognized by the public. After this early stage of the rough evaluation of the project, the project whose benefits/costs ratio exceeds one is not abandoned and made specific. The alternatives of the project are devised and the benefits and costs of the alternatives are assessed. At this stage, all the feasible alternatives need to be found by the DPW and the public and the benefits and costs of the alternatives should contain the public's interests. Finally, the alternative which maximizes the benefits/costs ratio will be chosen.

From this conceptual process viewpoint, the problems of the I-95 project and the Route 52 project are analyzed as follows:

i) Recognition of the benefits and costs

Compared with the Amherst bypass project, state-wide or regional benefits and costs of the project were not sufficiently recognized by the public or the benefits were irrelevant to some communities and individuals.
ii) Alternatives

Process of finding alternatives and estimating impacts should involve the public. Sometimes citizens find alternatives that are different than the proposed one. However, as the three cases showed, the DPW and the EIS consultant do not seem to be eager to develop a wide variety of alternatives or at least to interact with the communities. The community themselves do not always have enough time and skill to find alternatives suited to their own interests, and if they do not trust the DPW, other consultants may be hired by the communities. The hired consultant may attempt to coordinate the different interests and propose appropriate alternatives. There are problems concerning this hiring of consultants by individual communities. These problems are discussed later.

iii) Decision making

Decisions must be objective and it is desirable that each decision convinces all the concerned parties, but often opposition develops. The Amherst bypass project was decided by the Town Meeting, that is, the representatives of the Town made the decision. This method of decision making was effective in this case. However, this method cannot be directly applied to large-scale projects such as I-95 or I-190. If the method of Amherst bypass decision is applied to a project which involves several communities, the decision maker would have to be a combination or union of the involved communities, but this may be what the DPW is.
Excluding the problem of the allocation of power, it is doubtful whether a joint decision would convince the concerned parties, although the related discussion may be useful. Furthermore, if the highway serves regions other than the affected communities, there is the danger that the outside regions' interests may not be reflected in the decision. A similar problem comes out of a referendum method of decision making and is discussed later.

4. Massachusetts Action Plan

In June, the FHWA put out PPM90-4 which directed the state highway agencies to prepare Action Plans "to assure that adequate consideration is given to social, economic, and environmental effects of proposed highway projects and that the decisions on such projects are made in the best overall public interest." In response to this, the DPW published the Massachusetts Action Plan in 1974. This Action Plan intends to unify the EIS process as well as social and economic considerations into a systematic and well-balanced transportation planning process. Therefore, it is useful to assess the Massachusetts Action Plan on the basis of our evaluation criteria.

a. Outline of the Massachusetts Action Plan

The Action Plan utilizes four major "process" elements:

i) the identification of economic, social and environmental issues;
ii) the consideration of alternative courses of action; iii) the full involvement of interested public and private parties; and iv) the use of a systematic interdisciplinary approach to transportation planning and decision making.
The Action Plan declared that:

"...planning is no longer seen as merely a "technical" process which is expected to produce a single, "best" solution to each transportation problem, to be adopted in turn as a matter of course by responsible officials. Instead, the process is characterized by an open, wide-ranging and evenhanded search for information, on the basis of which public officials and private citizens can evaluate the costs and benefits of alternative ways of deciding critical transportation issues."

Thus, the EIS process is to be coordinated within the structure of an open planning process balancing environmental, social, economic and technical considerations. However, this spirit must be actualized in the planning process and within the DPW's organization.

The highway planning and development process is divided into three phases or cycles: "system planning", "project development", and "design".

In the system planning phase, transportation needs, the analysis of alternative means, and the priorities are identified by the DPW, Regional Planning Agencies (RPA) and the regional Transportation Policy Advisory Groups (TPAGs). The end project of the system planning process is a Planning Study Report (PSR). The second project development phase begins with the action level selection. A "Level of Action Committee" assigns one of four "levels of action" to each highway project. The four categories are: Level I--Major Impacts (adverse economic social environmental impacts); Level II--Moderate Impacts; Level III--Minor Impacts; and Level IV--Negligible Impacts.
After setting the level, location and environmental impact studies are undertaken. Depending on the level of action, a number of formal public meetings are to be held, and, in addition, technical assistance programs are carried out for Level I and II projects. This phase includes EIS preparation and review process.

After all the necessary approvals have been obtained, the alternative selected for implementation enters the design phase. During this phase, final plans, specifications, and estimates are developed.

b. Evaluation

i) Coordination with other agencies and public participation

The Action Plan prescribes that throughout the phases various units within the DPW continue to carry on liaison with federal agencies in order to inform them, as early as possible, of developments and to obtain information and comments.

As to the state agencies, the DPW and the various agencies are to interact during the development of highway projects under the inter-agency memoranda of understanding developed by the Inter-Agency Liaison Section of the DPW.

Local governments are invited to request that particular options be considered by the DPW prior to the initiation of a project development phase study. In addition, informal and informational meetings with local and state officials are to be held.

The purpose of these meetings is to establish coordination with other agencies.
In addition, the Planning Study Report may be an even more important means of spreading information and soliciting comments. This report is to be circulated so that other agencies and the public can discuss, comment, and advise about the decision at an early stage. Furthermore, regional priorities recommended by the TPAGs are to be made available to local communities for review and comment. In addition, with regard to Level of Action determinations, "interested public officials and private parties may at any time recommend to the Committee that a Level of Action determination be reviewed. Committee determinations will be published in the project communities for review and comment." Therefore, before the EIS stage, chances of coordination increase.

During the engineering design phase, depending on the Level of Action, design meetings with abutters, state, local agencies or public meetings are to be held and policies concerning the design and participation of other agencies and public are to be established.

The roles of the Regional Planning Agencies and TPAG's are important means of bringing the administration nearer to the communities. Thus from the viewpoint of participation of the other agencies and the public, the Action Plan represents progress.

However, there remains the problem of the Plan's implementation. It is important to arrange the internal organization of the involved agencies for the purpose of early implementation and to hold the agencies to more than perfunctory compliance with the Action Plan.
In addition, since the TPAGs, which are very important, are open to interested officials and citizens wishing to participate, but are limited in size, there is the problem of whom should be appointed. There are also practical problems such as the procedure for commenting to the PSR or for listing of priorities.

ii) Benefits

Since the Action Plan requires a Planning Study Report, a listing of priorities, more public meetings, and effective interaction processes, it will be accompanied by more costs and time. However, it will bring about better planning and results. If the Action Plan is implemented effectively, it may help to minimize friction or conflict between the DPW and the concerned parties and, thus overall efficiency of the transportation system would be improved. Furthermore, there is a possibility that increased public involvement would revitalize local democracy and increase the competence of local leaders in managing their own affairs.

iii) Social equity

The Action Program does not introduce any new compensation programs or relocation programs, but the relocation studies and procedures are unified in the project development and design phases and therefore they may function better. Moreover, public participation may increase under the Action Program so that the opportunity to speak for equity will be increased.

iv) Objectivity

The Action Plan explains the Planning Study Report as a common source of information which:
"presents information evaluating the costs and benefits of alternative plans and programs in an even-handed fashion, thus permitting participants to arrive at informed judgements as to which options should be carried forward".\textsuperscript{30} (emphasis added)

Further, the objectivity of the PSR can be examined by the public meetings and comments.

Regarding regional priorities, the Action Plan provides that:

"In order to elicit the support of local communities for the recommended plan, aspects of regional priorities which are in conflict with community priorities must be clearly explained. ... Comments of the local communities will be included with the priority listing submitted."\textsuperscript{31}

With different opinions being expressed, bias in decision making may be avoided. Above all, the DPW "officials will not exercise their decision making responsibilities without first obtaining the advice generated within the participatory process described in the Action Plan".\textsuperscript{32}

Thus, while the provisions of the Action Plan assure objectivity, achieving this objectivity will still depend on the Plan's implementation and review.

C. Conflict in the EIS process

During the planning process, especially in the EIS process of highway projects, different values, interests, and priorities come to the fore and frequently they are in conflict with each other, thus making it difficult to reach a consensus or agreement.
Although the values or interests related to the highway project must be clarified for the purpose of good, fair, and democratic decisions, the decisions can seldom satisfy all the different values and interests, and it is not clear how this conflict should be dealt with. Sometimes the conflict causes delay, increases costs of the project, and results in unfavorable relations between the parties in conflict. The questions of whether those effects are inevitable or necessary and of how consensus or compromise can be reached are discussed in this section which analyzes the conflict inherent in the EIS process.

1. Depolarization

If the selection of alternatives is made by the DPW, the parties that oppose the chosen alternative will be unsatisfied. But dissatisfaction does not always lead to disagreement. In some cases the dissatisfied group does not fight the decision since they know the other concerned parties' interests are stronger or more powerful than their and they have to give up, although the decision is unfavorable for their interests. In the other cases, they still feel that their interest or value has not been treated fairly. In this case, if they have enough will, time, and money, they may take action against the DPW. They may try to obstruct or litigate against the DPW and other agencies, campaigning, or bring a law suit if they consider that the EIS is deficient or that the decision is arbitrary, capricious, and represents an abuse of discretion.
Ultimately the courts must judge the adequacy of the DPW's decision. If there are only two positions with reference to the highway project, that is, either for or against the highway, and constructing a highway is good for only one party but bad for the other party, then this conflict becomes a zero-sum game. However, such a situation may be rare. Thomas C. Schelling wrote that:

"Pure conflict in which the interest of two antagonists are completely opposed, is a special case; it would arise in a war of complete extermination, otherwise not even in war. For this reason, "winning" in a conflict does not have a strictly competitive meaning; it is not winning relative to one's adversary. It means gaining relative to one's own value system; and this may be done by bargaining, but mutual accommodation, and by the avoidance of mutually damaging behavior."\(^3\)

Thus the conflict clarified by the EIS process of the highway project may be solved by "bargaining, by mutual accommodation and by the avoidance of mutually damaging behavior".

But how can the conflict be resolved? What kinds of bargaining techniques or programs can be used as responses to such conflict?

2. Public participation techniques

One way to avoid mutual distrust and polarization of views is to encourage public participation from the early stages of the planning. The EIS review process and informal and public meetings, hearings and workshops afford chances for mutual understanding and negotiation. For example, in the Route 52 case, Worcester County League of Sportsmen's Clubs opposed Scheme IV-A, recommending Scheme III for the Indian Lake segment in the comments, but after that, a contact was made and they were convinced of Scheme IV-A.
The compromise between the DPW and the Town of West Boylston may be another example, although the bargaining was made after the publication of the final EIS. Further, the Planning Study Report review or the review of the listed priorities that are introduced by the Massachusetts Action Plan, may increase the flexibility of bargaining. Such improvement of the coordination process allows a more response to conflict, although adequate use of those techniques needs to be studied.

There are special techniques for community coordination other than those described above. In particular, the Urban Systems Laboratory Report mentions, Referenda, Technical Assistance, Mediation and Arbitration, Ombudsman, and Charrette as special purpose techniques. They are explained as follows:

a) Referenda:

"A referendum is the practice of submitting an issue or measure to popular vote. It allows the general public to join in making a decision that will have significant effects on their lives. The difficulty is that it is nearly impossible to meaningfully establish who has the right to vote. And also lack of legal power or voter turnout becomes a problem. Furthermore, there is a main problem of how to set a questionnaire or to phrase yes-no alternatives."\(^{35}\)

In the Amherst bypass project, a referendum could have been used. The effects of the bypass are almost completely limited to the town. In fact, the Town Meetings made decisions in lieu of a citizens' vote. Since the members of the Town Meeting are representatives of the town people, the effect was probably very similar.
However, in a sense, there remains the problem that some people in the town are relatively unaffected by the bypass but they would have the right to vote. In another sense, since they are not affected, they perhaps could decide objectively. The use of a referendum in such a case may depend on whether the agreement to use this method can be gained initially.

In the I-190 case, selection of voters would have been difficult. For example, it is not clear whether it would have been proper to include Clinton or Fitchburg, or/and the Boston Metropolitan District since Boston would have been affected by the alternative crossing the Reservoir.

With regard to I-95, voters could not have been selected since the users as stated in the purpose of the project are tourists from the outside regions. However, without input from those users, the project may have been discarded on the basis that only tourists would gain benefits from the highway, and therefore the highway did not need to be built.

b) Technical assistance

"The Mass. Action Plan provides technical assistance of the DPW staff to the communities. But when some communities are dissatisfied with the DPW's proposal, it is possible that an advocate planner be hired by the communities. Advocate planners may develop alternative proposals for client groups and also may act as technical consultants to help review and critique agencies' proposals. The community or group should be given earmarked funds and control". 36

"First it proved very difficult to identify the client or community to be serviced."
A community is heterogeneous and efforts to locate a single-client-organization to represent it, ..., proved exceedingly difficult. ...the planner discovered that local decision units can be parochial...". 37

In the Amherst bypass case, a consultant was hired by the Town to study alternatives prior to the EIS. This technical assistance seems to have been useful in this case, although there was some question of whether specific neighborhoods' interests were represented.

Regarding the I-190 project, it is difficult to identify the client, because there are several affected towns and cities, and also affected neighborhoods, whose interests are complicated. However, if a unified group could have been organized and its interests arranged, hiring and advocacy planner would have been possible and the conflict between the DPW and the town of Sterling or West Boylston might have been avoided.

In the I-95 case, there is a major conflict between the DPW and the Essex County Conservation Association. The Association hired a transportation consultant for the law suit concerning traffic projections, but this technical assistance is different from the standpoint of coordination. In this case, the effectiveness of an advocacy planner is questionable, since the Association's concern is based on doubting the need for the highway, but an advocacy planner could have played the role of intermediary and might have avoided polarization and distrust.
c) Mediation and arbitration

"Mediation and arbitration are both methods of intervention between conflicting parties by a third person or groups to promote reconciliation, settlement, or compromise; arbitration goes further to hand down a decision". 41

The methods of mediation and arbitration are commonly used for conflict resolution between management and labor. But they are not established methods with reference to highway projects or conflict around environmental issues. In resolving the conflict between the communities, the DPW can play the role of mediator, but for conflicts between the DPW and communities or groups, a third mediator or arbitrator is necessary. It is not clear who should be appointed as an arbitrator or a mediator or who these parties are. But it may be worthwhile to consider whether this technique is effective and whether it should be instituted.

In the Amherst bypass case, a potential conflict between the two neighborhoods near two alternative termini might have been mediated by the DPW, but in fact the DPW entrusted the decision to the town and superficially the problem resolved by the autonomy of the town.

In the I-190 case, the conflict between the DPW and Towns of Sterling and West Boylston can be an object of arbitration or mediation. There are current negotiations concerning the location but if the conflict becomes definite and the positions become polarized, then arbitration or mediation could be introduced.
The citizens groups, the Essex County Preservation Association in the I-95 case, and the I-190 Concerned Citizens in the I-190 case brought legal actions against the highway projects. If this system of arbitration and mediation had been established, these law suits might have been avoided. Nevertheless, if they preferred to question the legal points through the judicial system, arbitration would not have been useful.

d) Ombudsman

"The ombudsman is an investigative officer charged with the responsibility of protecting the public from bureaucratic bungling or abuse of power. Typical duties would include hearing and responding to complaints, rectifying mistakes or abuse and cutting "red tape", making reports and recommendations for corrective action, and general improvements in agency operations and decision making".  

In the EIS process, the DPW and other agencies can play a role similar to the ombudsman unless they are in conflict with the public. The community liaison officer within the DPW listens to the complaints and requests of the communities and coordinates the DPW and the communities. The other agencies sometimes represent communities' complaints or introduce concerned groups, and comment in response to the draft EIS. However, such functions of the existing agencies are substantially different from those of the ombudsman.

The institution of ombudsman originated from the Scandinavian countries. The ombudsman chosen by the legislature "has no right to reverse or veto an administrator's decision and he has no direct control over the administration. His...weapon is publicity, through his annual or special report to the legislature."
His method of handling grievances against administrative decisions is direct, informal, speedy, and cheap. His duty is to be impartial, expert, and accessible to the public”.

If the ombudsman system is introduced to the U.S., the basic social legislative, judicial, and administrative differences between the Scandinavian countries and the U.S. must be considered, and suitable applications should be found. In the 1960's, the ombudsman concept was noticed and the system was induced in several states and local governments. However, if the ombudsman system is applied to conflicts caused by proposed highway project or environmental problems, an individual general ombudsman may not be appropriate, because the issue requires special expertise and technical knowledge. Therefore, the ombudsman must have special capability as well as general knowledge.

Applying the ombudsman system to the three cases, comments similar to those contained in the mediation and arbitration section may be made.

e) Charrette

"Charrette is a highly intensive effort to produce plans and solutions to particular problems within strict deadlines. Typically, a steering committee whose membership is open to anyone interested meets weekly over a period of two or three months to develop topics for the charrette, identify issues, and collect data.

One or two weeks of full-time working sessions are held, often conducted at night and on weekends. Participation should involve key decision makers and all important interests, but also should be open to everyone from the community. The sessions are oriented to achieving a consensus recommendation. Working against a deadline forces people to crystallize their ideas into proposals and helps induce the kind of intense issue analysis that is needed to formulate alternative solutions and to compromise on stated positions".39
The charrette process has been used to solve problems dealing with educational facilities or community development. The charrette can provide an opportunity to solve the problems using cooperation and participation to reach a consensus decision. In order to resolve possible conflict in advance, the charrette could be useful for resolving environmental issues that occur during the planning of a highway project. However, the time involved in one or two weeks of full-time working sessions is hard to arrange and a high level general participation cannot be always expected. It is also difficult to prepare agencies' staff, including key decision makers, to be ready all the time. Further, clarified confrontation cannot be necessarily resolved in the charrette process. Nevertheless, at the stage of the alternative finding, selection and priority decisions in the three cases, the charrette might have worked effectively, avoided future conflict and gained consensus if it had been used.

The special techniques described above seem hypothetically useful in some stages of the planning process depending on the case, but the costs of the techniques have not been assessed. The experimental application of these techniques should be considered in the EIS process.

3. Compensation

In order to resolve the conflicts, compensation is a noteworthy technique. For the people whose land is taken, just compensation is considered and implemented. In addition, relocation programs are carried out by the DPW.
The compensation value of the taken property is based on the fair market value, but if the relocated people's land has a greater emotional value than assessed value, the dissatisfaction may remain and conflict may follow. Consolation, agreement or convincing can be gained by the public participation process described above. Another way is to satisfy the affected parties by enough compensation.

In economics, compensation is discussed as follows:

"Most economists agree that a movement is desirable if no one's utility is decreased and at least one person's utility is increased. Most changes would result in a reduction of someone's utility unless compensation is provided. ... A number of economists have made potential rather than actual compensation the criterion for judging whether a change is socially desirable. Three prominent compensation criteria are:

The Kaldor criterion. Allocation A is socially preferable to B if those who gain from A could compensate the losers (i.e., bribe them to accept A) and still be in a better position than at B.

The Hicks criterion. Allocation A is socially preferable to B if those who would lose from A could not profitably bribe the gainers into not making the change from B to A.

The Scitovsky criterion. Allocation A is socially preferable to B if the gainers could bribe the losers into accepting the change and simultaneously the losers could not bribe the gainers into not making the change." \(^{42}\)

Usually, in the highway projects, compensation is considered in terms of Kaldor criterion. If the Hicks criterion is applied to the highway project, the losers who will be affected by the highway must bribe the gainers in order to prevent the change.
However, these criteria are potential, conceptual, rather than actual, and "in general, nothing can be said about the social preferability of A over B in the absence of actual compensation unless one is willing to make additional value judgement".

From the judicial point of view, "'just compensation' does not generally require payment for destruction of a business, loss of profits, loss of good will, or relocation expenses occasioned by the loss of property through condemnation, even though these losses and expenses would certainly affect any selling price set by an owner". Thus, generally just compensation for the land taken is done on the basis of "fair market value" which is the conclusion sought by courts.

D. Conclusion and recommendation

In order to evaluate the EIS process as related to highway project planning, five criteria, that is, coordination with the other agencies, public participation, social equity, effectiveness, and objectivity are set and applied to the three EIS cases studied. The evaluations of the cases, based on these criteria, reveals some benefits of the EIS process and can identify some of the problems. Thus, the criteria are shown to have considerable utility. However, the criteria themselves and evaluation need further study and scrutiny, especially for cost-effectiveness and social equity.

The Massachusetts Action Plan, which organized the EIS process into a systematic planning process, is evaluated with the five criteria, and is judged to be an improvement.
Nevertheless, it is not clear how the conflicts which are clarified in the EIS process as forms of condensed problems can be solved. Therefore, means of conflict resolution are examined. As a conclusion, it can be recommended that the EIS process and further total planning processes and decision processes should be improved to satisfy the five criteria described above. For that purpose, some effective techniques, such as hiring advocacy planner or a mediation, etc. should be considered, depending on the projects.
FOOTNOTES

1. CEQ Annual Report of 1973

2. Plaintiffs' supplemental memorandum in support of their motion for preliminary injunction, Essex County Preservation Association v. Bruce Campbell, U.S. District Court, 1974

3. J. Skibiski's comment in Northeast Bypass Road, Amherst-Hadley, Final Environmental Impact Statement, 1974


5. Impact Assessment Program, University of Massachusetts, Legal Sufficiency Checklist--Drft 3, 1974

6. 6 ERC 2067

7. 6 ERC 1826

8. 2 ERC 1781

9. 6 ERC 1275


12. The letter from Comptroller General of the U.S. to Kenneth Robinson, House of Representative dated Apr. 23 1974

13. 6 ERC 1001

14. 5 ERC 1749

15. 5 ERC 1683

16. 5 ERC 1231

17. 4 ERC 1329

18. 4 ERC 1468

19. Letter from Peter Haack to R. Wolfe, June 24 1974

20. 3 ERC 1595
21. 6 ERC 1088
22. 6 ERC 1891
23. 6 ERC 1993
24. 5 ERC 1625
25. 5 ERC 1989
27. FHWA Policy and Procedure Memorandum 90-4, 1973
28. DPW, Massachusetts Action Plan, 1974, p.16
29. ibid. p.45
30. ibid. p.95
31. ibid. p.122
32. ibid. p.87
34. M. Manheim et al., Transportation Decision-Making, Urban Systems Laboratory, MIT, 1974
35. Source: ibid. p.107
36. Source: ibid. p.109
38. M. Manheim et al., Transportation Decision-Making, Urban Systems Laboratory, MIT, 1974, p.110
39. ibid. p.111
40. L. Tibbles et al., Buffalo Citizens Administrative Service: An Ombudsman Demonstration Project, University of California Berkeley, 1970
41. W.L. Riddick, Charrette Process, Shumway, 1971
42. J. Henderson and R. Quandt, Microeconomic Theory, McGraw-Hill, 1958, p.279
BIBLIOGRAPHY

Massachusetts Department of Public Works, Final Environmental Impact Statement of I-95 from Middleton to Newburyport, 1973

Massachusetts Department of Public Works, Final Environmental Impact Statement of Northeast By-pass Road, Amherst-Hadley, 1974

Massachusetts Department of Public Works, Final Environmental Impact Statement for Interstate 190, 1973

Massachusetts Department of Public Works, Massachusetts Action Plan, 1974


A. Altshuler, The City Planning Process, Cornell University, 1965

S. Ebbin and R. Kasper, Citizen Groups and the Nuclear Power Controversy, MIT Press, 1974


A. Lupo et al., Rites of Way, Little, Brown and Company, 1971


R. Dorfman et al., Economics of the Environment, Norton, 1972


M. Manheim et al., Transportation Decision-Making, Urban Systems Laboratory, MIT, 1974

M. Rein, Social Policy, Random House, 1970

L. Tibbles et al., Buffalo Citizens Administrative Service, University of California Berkeley, 1970

W. Gellhorn, Ombudsmen and Others, Harvard University Press, 1966

W. Riddick, Charrette Process, Shumway, 1971

D. Hagman, Urban Planning and Land Development Control Law, West Publishing, 1971