THE EFFECTS OF THE FEDERAL AIR QUALITY PROGRAM ON CERTAIN LOCAL LAND USE PLANNING DECISIONS--A CASE STUDY OF SANTA CRUZ, CALIFORNIA

by

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ABSTRACT

The thesis explores the relationship between the federal air quality program and certain local land use planning decisions, particularly those regarding the location, density and amount of land use activity. The primary concern is to identify, qualitatively, the degree of federal influence on these local decisions, although the forms and channels of federal influence are also considered. First, the relationship between land use and air quality is analyzed. The thesis examines the extent and limits of current knowledge regarding the ways in which location, density, and amount of land use activities affect air quality, a number of proposed land use strategies and techniques for improving air quality, and, finally, four procedures for incorporating air quality concerns in the land use planning process. The federal program is identified as having played a major role in heightening local awareness of the air quality-land use relationship. Subsequently, the history of the federal air quality program is discussed with

particular emphasis on the 1970 and 1977 Clean Air Act Amendments. The analysis describes the growth in federal involvement as well as the activities of all governmental levels, the controversies surrounding the federal initiative in the land use area, and the shifting federal commitment to influence land use decisions. Finally, using the case study approach, federal influence on local land use planning decisions is investigated in depth. Three measures of federal influence are identified and applied to two general planning and two air quality planning decision processes in Santa Cruz, California. The major findings are that while the extent of federal influence was minimal in all cases, there were significant differences between the cases. A local political climate favoring growth control and environmental protection was positively related to increased federal influence. Other factors possibly affecting federal influence were cited and suggestions offered for expanding the incorporation of air quality concerns in local land use planning decisions.

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2) The plan contains specific air quality-land use goals, policies, or programs

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V. B. 7. b. 3) The plan contains a technical analysis of the air quality-land use relationship
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I.

GENERAL INTRODUCTION

This thesis explores the effects of the federal air quality program on certain local land use planning decisions. It concerns intergovernmental relationships, the implementation of public policy in one area of environmental concern, and the relationship of land use planning to air quality.

A. Sources of Interest

The primary motivation for studying these issues stemmed from the author's personal experience with air quality planning while employed by the County government of Santa Cruz, California. A limited involvement with the subject generated certain ideas regarding the nature of the air quality problem and the federal-local relationship. The thesis grew out of a desire to examine these speculations in greater depth and to investigate their validity.

While it was recognized that significant questions existed, the initial expectation was that the following assumptions would be substantiated by the thesis:

1. the local air quality problem was serious and rapidly deteriorating;
2. land use measures were essential for solving the air quality problem;
3. the federal government recognized the importance of the air quality-land use relationship and was committed to its incorporation in local planning decisions; and

4. local governments were unwilling to seriously consider the air quality implications of their land use decisions and simply wished that technology would make air pollution go away.

In part, these issues were of interest because they were related to more general topics of concern. One of these was the potential expansion of federal control over local land use planning decisions. Land use planning has traditionally been viewed as a primarily local prerogative. Over the past several years, concerns have been raised regarding increased federal intrusion in this area. Fears of a federal takeover have been voiced. Are these fears based on reality? Are local prerogatives being overturned? What has been the local response? Has the local planning process become a battleground between the federal government seeking to reduce air pollution and local agencies trying to maintain control over land use decisions?

The involvement of the federal government in local planning decisions is particularly important for local planners. Planners often play the role of interpreting federal policy to local decision makers. Are these planners caught in the middle between federal and local demands? How are they responding to federal pressures?

A second general concern was with the implementation of public policy. How are federal air quality policies regarding land use controls being implemented at the local level? What factors affect this implementation? What changes in the policies themselves have resulted from the implementation attempts?

The thesis provided the opportunity to investigate these topics for one subject area in some detail.

B. Analytic Approach

This thesis is essentially grounded in a problem-solving approach. The definition of the task, the mode of analysis, the overall perspective are all based on this orientation. Larger structural considerations concerning the society as a whole are not included to any great extent. While the problem-solving approach is only one of many, it does provide valuable and enlightening information on policy questions.

1. Methods

A number of specific, analytic methods are used to study the thesis concerns. Primarily, a case study analysis is employed to examine in depth the potential federal influence on four local planning decision processes in one geographical area. Three broad, qualitative measures are derived which provide indications of federal influence. After the presentation of the evidence, these measures are applied and conclusions drawn. While a major objective of this analysis is to identify the extent of the federal air quality program's influence on local land use planning decisions, there is also an attempt to understand the factors that contribute to federal influence, the forms it takes and the way it works. The case study method has its limitations, especially in terms of the ability to generalize the results or to know whether the significant variables have been identified. However, it provides the opportunity to appreciate the intricacies and subtleties of inter-

governmental problem solving and to increase understanding of the complex fabric in which public policy relationships are interwoven.

Other analytic techniques are also used. Employing a content analysis of the existing literature, current knowledge regarding the relationship between air quality and land use is explored. In addition, an historical and policy review of the federal air quality program is presented.

A final analytic tool included in the analysis is the null hypothesis. The approach used here is not quantitative and, in fact, given the nature of the topic, it would be very difficult, if not impossible, to quantify the variables in a meaningful manner and manipulate them statistically. On the other hand, it is necessary to avoid an undisciplined discussion of an "interesting" subject. The evidence, therefore, must be presented in an organized and analytic fashion. In order to help organize the presentation, the null hypothesis concept has been borrowed from the more statistically oriented research methodologies. With this concept, an hypothesis is stated in negative terms. It becomes relatively easy, then, to identify evidence contrary to the hypothesis, where it exists.

In this case, the null hypothesis would be that the federal air quality program has had no effects on local land use planning. The study then focuses on evidence indicating the presence of any such effects. However, while the thesis, at times, talks in terms of the null hypothesis, it should be remembered that the term is used informally, that is, as a starting point

and an organizing tool.

2. Definition of Terms

Although the findings of this thesis will have certain implications for other federal policy initiatives, the primary intent is to describe the impact of the federal air quality program and broad generalizations to other federal programs are not justified. Further, it has not been possible to explore all aspects of the federal air quality program or of local land use decision-making. It is necessary, then, to more precisely define how these terms will be used.

a. Federal Air Quality Program

The federal air quality program will be defined as the federal Clean Air Act and its implementation mechanisms, with particular emphasis on the 1970 and 1977 Clean Air Amendments. Other federal legislation and activities related to air quality will not be directly considered here.

Even with this limited definition, the federal air quality program covers many areas, including stationary sources of pollutants, mobile sources, standards, planning, and research, among others. A main emphasis here, however, will be on the land use implications of the federal program. Moreover, the implementation of the 1970 Amendments changed through the years in response to a variety of pressures and the 1977 Amendments are significantly different from those of 1970 in a number of important respects--for instance, land use controls--so that the program cannot be viewed in static terms. On the other hand, while the specifics of the federal program have

varied, the overall concerns have been maintained.

b. Local Land Use Planning Decisions

Local land use planning decisions also cover a wide range. Capital improvement plans, design plans, project review, growth management programs, housing and community development plans are just a few local planning activities affecting land use. As a practical matter it is not possible to consider the full range of planning activities in an effort of this sort, even for one geographical area. Moreover, the types of land use activities studied are also limited. Primarily, the location, density and amount of land uses receive the major emphasis. Other aspects of land use planning such as design control, performance standards, economic analysis, are treated minimally, if at all.

The case studies investigate only two kinds of local land use planning decisions--the local general plan and the locally produced air quality plan. There are several reasons for this choice. The general plan is usually the cornerstone of the local land use planning effort. Through the general plan, a local agency makes its basic decisions regarding future land use in its area. The general plan is particularly important in California where State law requires that zoning be consistent with it.

If the federal air quality program is affecting local planning decisions, then, it is likely that these effects will be evidenced in the general plan and in the process leading to its preparation.

Air quality plans are included because their explicit purpose is to provide for the attainment of federal air quality standards and they, therefore, provide a good opportunity to determine whether and how much land use planning decisions are used by local agencies in their efforts to meet these standards. Air quality plans offer the most direct channel for the federal government to effect local land use planning decisions. Certainly local agencies would want included in their air quality plans any relevant land use measures they had adopted in order to indicate their good faith efforts to achieve the federal air quality standards.

In studying the federal air quality program's impact on local land use planning, then, especially in terms of the air quality-land use relationship, the concentration on the general plan and air quality plan seems appropriate.

A brief clarification of the term "local" may also be helpful. As used here, "local" refers to general purpose city and county governments, as opposed to special districts and other local agencies. Two of the case studies concern regional plans, however, and there is a need for further clarification of the term. First, the regional plans analyzed in the case studies will be examined, primarily, from the perspective of their effects on <u>local</u> (city and county) planning decisions. Secondly, as will be discussed later, in a fundamental sense the regional agencies which produced these plans are local in nature. The governing bodies of both "regional" agencies involved are made up either entirely or almost entirely of city

and county representatives. While there are significant differences between plans made by a single locality as compared to plans made by representatives of a number of localities, all the plans studied can be seen as essentially local.

C. The Federal System

The ability of the federal air quality program to influence local land use planning decisions is constrained in certain basic ways by the nature and characteristics of the federal system. It is not possible here to provide an extensive analysis of American federalism and the nature of intergovernmental relationships in general but some observations are necessary in order to place the subsequent analysis in its proper context.

To a large extent, the nature of intergovernmental relations in the United States has been determined by the fundamental ambivalence towards government which has existed since the country's formation. On the one hand, there is a deep distrust of government and a great fear of government abusing its power. On the other hand, there is a recognition that government plays a basic and necessary role in solving the problems of the society. This ambivalence was expressed in the American Constitution itself. The Constitution imposes basic limitations on the ability of the federal government to exert its influence over other governmental levels and, at the same time, provides a structural basis for other governmental levels to resist federal intrusions.

In this regard, Daniel Elazar has characterized the

federal system as being neither centralized nor decentralized but, fundamentally, non-centralized in nature. He defines non-centralization as "the structural dispersion of power among many centers whose legitimate authority is constitutionally guaranteed."[1]

In his view, non-centralization is the key to the diffusion of power which structurally prevents the legitimate centralization of power by the federal government.

Though not specifically mentioned by the Constitution, local governments have significant power within the federal system. In large part, this power derives from the independent power of the States. In addition, specific, locally targeted federal legislation has expanded its authority. Local governments also come by their power informally. They are the units of government closest to the people. Local representatives are usually elected from small areas and remain (geographically, at least) close to their constituents. They function, in many areas, as the first line of public service and are often bellwethers of the public mood. Local governments also derive their influence from their characteristically close ties with members of the federal House of Representatives. These Congressmen, since they often represent small geographical areas, are in significant ways seen as local officials. They tend to regard their relationships to local governments in their area as extremely important and, therefore, strive to respond to local concerns. It has even been argued that when local governments work together on a particular issue, rather than

at cross purposes, they invariably succeed.

The relative distribution of power through the years between the three governmental levels has been the subject of much debate. It is generally agreed, however, that there has been a tremendous increase in the power of all governmental levels in this century. Federal influence has expanded greatly, largely through increased financial assistance and regulatory programs. On the other hand, the role of local governments has also expanded greatly; due, in part, to increased federal assistance itself. Moreover, through the years localities have successfully resisted federal influence or, at least, mitigated its impact, when they so desired.

Richard Leach, a respected commentator on American federalism, has described the process by which the powers of government under American federalism are distributed as follows:

> Government power in the United States is, in sum, a matter for the joint exertion of the several units of government who among them share the responsibility for serving the people of the nation. There is no formula for the exact distribution of that responsibility; it is something that has to be determined in each case by the need to be met, the pressures involved in bringing it to the attention of government, and the availability of resources to provide for it. Every time an extension of power is called for, how it shall be made becomes a subject of debate and controversy, often protracted and sometimes bitter. Power is always in contest. That is the key to understanding the federal system."[2]

A number of factors seem to influence whether intergovernmental conflict exists in a particular area and how much there is of it. One important factor is public sentiment. In the face of public criticism there is a tendency to shift the blame

from one level to another. At other times a particular level of government will share the public criticism of another level of government and act accordingly. For example, to a large extent the Great Society programs of the 1960's were a reaction to widespread criticism of local governments for their perceived insensitivity to the needs of the poor.

A related factor in intergovernmental conflict is the impact of powerful private interests. In general, the federal system works in such a way that anyone unhappy with a decision made by one level of government can usually seek to have it changed at another level and private interests often attempt to play one level of government against another toward their own ends. For example, private industries adversely affected by the implementation of federal standards for the treatment of wastewater may apply significant pressure on local government to get them to fight with the federal government for a waiver of the standards. This tendency will also be seen in the history of the air quality program.

The specific history of a particular governmental activity can also be identified as a source of conflict. In some areas there has been tension and debate between governmental levels since a program or activity began. Usually, this is due to some fundamental disagreement over initial rules. The conflict over implementation of the 160-acre limitation on farms in the Central Valley of California is an example. One level or another is never able to accept the distribution of power and continually seeks to extend its influence and restrict the

influence of the adversary agency. If the issue seems important enough, one party or another will never give up.

Related to this is the tendency for conflict to result from the inauguration of a new activity. The incursion of one level of government into an area perceived by another as its special area of interest will often lead to sharp conflict. It is through new activities that the federal government, for example, is most likely to seek to expand its influence and local governments realize that, if the attempts are not resisted initially, the changes may soon become irreversible. Such conflict usually results in an accommodation, though the particular accommodation reached depends on many factors and may take a long time to work out. This factor will be explored in greater depth subsequently, as the federal air quality program is a good example of a new activity which generated significant conflict.

The federal system obviously is not totally dominated by conflict. In fact, most areas of governmental activity involve a significant degree of interdependence and cooperation between the levels of government. It is generally recognized that the federal government is most able to raise revenues and is often in the best position to provide financial assistance to deal with a particular problem. State and local governments will often turn to the federal government and request their involvement simply due to the greater ability of the federal level to fund a necessary activity. State and local governments also turn to the federal level when they feel politically inadequate

to deal with a perceived problem by themselves. In 1963, for example, the National League of Cities was an extremely important lobbying group for legislation to provide a meaningful federal presence to combat air pollution.

Where local governments can't control certain private interests, can't cooperate among themselves to deal with a problem, or don't have the financial resources to undertake an activity they perceive as necessary, they commonly call on another level of government, even when the assistance they desire has strings attached. On the other hand, the federal government is often dependent on State and Local government to implement national policy or to carry out programs that the President or Congress perceive as important. In most areas the federal government has been extremely reluctant to extend its bureaucracy to the local level in order to achieve its objectives.

In general each level recognizes that the other levels can provide important assistance, both financial and otherwise, in carrying out their objectives. Each level also recognizes the independent power the other levels have. It is much easier for any governmental agency to achieve its goals if the other concerned agencies either actively support these goals or are willing to acquiesce. Obviously this is true both horizontally (among local governments) and vertically (between a local agency and federal agency).

In addition, much cooperation is based on money. Financial aid characterizes a great deal of intergovernmental

activity and the desire to keep the funds flowing creates a powerful incentive for cooperation even where particular strings attached to the funds may be odious. In many problem areas, local, and even State, governments are almost totally dependent on federal financial resources. In other areas, while the funds may not be necessary, they are desired.

All levels of government share the ideology of cooperation and, in fact, appear to seek cooperative relationships as much as possible.

The extensive cooperation that currently exists within the federal system probably results from the long history of the different levels of government working together, the widespread agreement on basic social values, and the fact that the response to many problems often developed from a joint intergovernmental effort.

The appreciation of the importance of cooperation serves to limit the expansion of federal activity. The federal government is generally reluctant to act in ways that would seriously threaten existing cooperative relationships. The same is often true of local governments as well.

A final characteristic of the federal system which should be considered concerns the willingness of government to take on society's problems and the traditional optimism regarding government's problem-solving ability. A basic assumption of our political system has been that the problems of the society will be solved and that, in many areas, the government can solve them. The question that observers of the federal system

tend to ask is not whether a problem can be solved, but how. There has been the almost universal belief that the solution to any problem could be found with either more money, better coordination, better organization, greater regulation, increased research, or more power granted to one level or branch of government or another. In fact, though, it may not be possible to find solutions to many problems or even make substantial progress. One reason for this may be the nature of the problem itself--its complexity, its contradictory demands, its costs, limited information. Another reason may lie in the nature of the federal system. Because power within the system is so diffused, it is exceedingly difficult to concentrate governmental effort on any particular problem. This is especially true where powerful interests have a great deal to lose if the problem is solved. The diffusion of power within the federal system itself makes it relatively easy to sabotage governmental effectiveness. While, in many ways, this is one of the system's great strengths, it also can make it nearly impossible to solve important societal problems. The system almost requires national crises and near consensus to assure a unified governmental response.

On the other hand, the public as a whole and private interests as well continue to turn to government to solve nearly every problem identified. Indeed, it is possible to relate the anger and frustration many people currently feel towards government to the unreal expectations that have been raised regarding government's ability to provide solutions. After

years of trying, with increased taxes and increased regulation, the major social and economic problems are still with us--crime, housing, poverty, employment, education, pollution, etc. In part, the public expectations have been fostered by government itself. At times it appears that a government's willingness to take on a problem is motivated more by the desire to expand its influence than from a realistic appraisal of its chances of success.

The point here is not that government should shun the problems of our society because they are difficult. It is only to recognize the inherent limits on governmental effectiveness and, also, the fact that the expectation that governmental activity can solve problems has tended to permeate the system at least at the beginning of any particular attempt. In reality, the way the problem is defined, the particular techniques proposed for correcting it, the attempt by each governmental level to maintain its power position, and the particular array of interests concerned can only be reconciled by compromises which, almost inevitably, make it impossible for the expectation to be achieved.

In the following study of the federal air quality program and its effects on local land use planning decisions, these characteristics and problems of American federalism will be observed.

D. Outline of the Chapters

The next chapter explores the relationship between air quality and land use. The first section investigates the

current state of knowledge regarding this relationship. The second section identifies a number of land use measures which have been suggested for improving air quality. The final section describes several techniques for integrating air quality concerns into the local planning process. The federal role in understanding the air quality-land use relationship is also described. The intent of this chapter is to determine whether it is possible for air quality concerns to substantially affect local planning decisions or, at least, whether professionals in the field believe it is possible and have suggested ways for bringing about an air quality-land use integration.

Chapter III presents the history of federal air quality legislation and its implementation with particular focus on its land use implications. The principal concern here is to consider the dynamic tension between the federal and local levels and their shifting roles in the area of air pollution control.

Chapter IV provides background information on the site of the case study analysis. Santa Cruz County is one of the fastest growing counties in the State of California. Until recently, air quality had not been considered a significant problem. In 1977, it was learned that because the federal air quality standards were being violated, corrective action was required. This chapter will describe the Santa Cruz community and its air quality problems. The role of the State of California in terms of air pollution control will also be briefly outlined. Finally, the major actors involved in local land use planning decisions and, particularly, the case studies will

be discussed.

Chapter V will present the analysis of the case studies. The chapter begins with a review of earlier comparative studies on the incorporation of air quality concerns in the local planning process. Methodological considerations are then discussed, followed by the data from the four case studies. The chapter concludes with an interpretation and evaluation of the evidence.

The concluding chapter ties together the earlier analysis and suggests conclusions regarding the larger themes and concerns of the thesis.

E. General Themes

A number of themes recur throughout this thesis and it may be helpful to explicitly identify them at the outset:

1. The ability of the federal government to expand its influence on the local level (how much and the factors affecting it);
2. The ways local governments respond to federal initiatives as well as to locally perceived problems;
3. Mechanisms by which the federal government seeks to extend its influence (forms, channels);
4. The difficulty in solving society's problems (the complexities, the search for governmental effectiveness); and
5. Finally, the central theme, the federal influence, through air quality legislation, on local land use planning decisions, via an understanding of the air quality-land use relationship.

GENERAL INTRODUCTION

Notes

[1]Daniel J. Elazar, "The Resurgence of Federalism" in The Uneasy Partnership, ed. Richard D. Feld (Washington, D.C.: National Press Books, 1973), pp. 300-30.

[2]Richard H. Leach, American Federalism (New York: W. W. Norton and Co., Inc., 1970), page 45.

II.

THE RELATIONSHIP BETWEEN AIR QUALITY AND LAND USE

"Land use patterns and their attendant activities have a major impact upon the type and amount of air pollution generated over a region. To the extent that land use can be associated with the discharge of pollutants, it is necessary to plan future land use and transportation that is compatible with acceptable levels of air quality. Although comprehensive planning has in the past been relatively insensitive to air quality considerations, it is now incumbent upon the planning community to define and implement the methodology, analytic tools, and standards that will be considered simultaneously with other environmental constraints and directives for planning new development."

> Alan M. Voorhees and Associates in Guidelines for Air Quality Maintenance Planning and Analysis, Volume 4.

"In its proper context, air quality planning can be viewed not as another attempt to impose a set of constraints on local decision making but rather as an opportunity to achieve, consistent with other planning goals, a quality of life standard that will insure the long term economic and physical viability of our cities."

> Julian Beaver in Comprehensive Planning for Air Quality Control.

In order to analyze the effects of the federal air quality program on local land use planning decisions, it is first necessary to understand the relationship between air quality and land use. Before the federal government can reasonably expect local governments to include land use measures as part of a strategy for reducing air pollution, there must be evidence that such measures will be effective.

There are three aspects of the air quality-land use relationship:

(a) the current state of knowledge regarding the ways land use decisions affect air quality; (b) land use strategies and techniques which have been suggested for improving air quality; and (c) approaches for incorporating air quality concerns into the local land use planning process.

A. General Qualifications

A number of factors relevant to the discussion of the air quality-land use relationship should be clarified initially in order to avoid repetition throughout the chapter and to identify certain limitations of the information presented.

1. Common Sense vs. Analytical Evidence

In reviewing the literature in the field, it became readily apparent that there are two general types of information. The first flows from logic, reasonableness, experience, intuition; in short, what appears to "make sense." It is not based on precise, quantitative data. The other kind of information is more analytical, is based on quantitative data and, usually, employs a statistical model. Although one critical review of the subject dubbed the first kind of material as hortatory and dismissed it, this judgment may be too harsh.[1] Both types of information have limitations and can be wrong. In fact, many observers characterize the current knowledge of the air quality-land use relationship as quite limited.[2] The common sense approach can provide valuable insights which later studies will substantiate. On the other hand, the analytic approach may include serious errors due to the omission of important variables or the limitation, of the analytic processes. Since knowledge is limited,

both approaches have been included in the discussion. Obviously, critical judgment has been used in selecting them.

2. Role of Technology

The importance of implementing land use measures to improve air quality will obviously vary, to a large extent, inversely with the success of technological solutions. If technological controls by themselves lead to clean air, other measures will be unnecessary. Krier and Ursin have characterized much of the history of air quality concern as being dominated by a "technological fixation"[3] and a number of authors see future technological progress as negating the need for land use and transportation measures to meet air quality standards. Others are more skeptical of technology. They argue that land use measures should still be considered even if substantial technological gains are achieved.[4] The discussion here is based on the assumption that technological improvements will not surpass those currently required by law; in other words, that federal emission standards for stationary sources and automobiles will be met, but not exceeded.

3. Stationary vs. Mobile Sources

The following discussion will include the consideration of both stationary and mobile sources of air pollution. Some of the literature, however, does not clearly indicate whether mobile as well as stationary sources were included in their analysis. It is, therefore, difficult to know how far to generalize the conclusions. Further, and related to this, a clear distinction between stationary and mobile sources is

sometimes impossible to make. Housing for example is a stationary source in that it produces pollutants from its heating systems. It is also a generator of mobile sources. On the other hand, while, traditionally, stationary sources were defined as industrial sources, industry is now seen also as a generator of mobile sources. Moreover, the addition of indirect or complex sources like parking lots further blurs the distinction. In considering the relationship between land use and air quality, then, it is often difficult to clearly separate stationary from mobile sources.

Finally, since the case studies described in this thesis are concerned with a geographical area where large industrial sources do not appear to be an important factor in future air quality problems, the land use control aspects of these activities are not as seriously considered as they might otherwise have been.

4. Transportation Control Measures

Transportation is intimately linked with land use and no discussion of the relationship of land use and air quality can ignore transportation considerations. The problem is where to draw the line. A detailed analysis of the effects of the whole range of transportation control measures on air quality is another thesis (at least one). On the other hand, most transportation control measures affect and are affected by land use decisions (that relationship, itself, could justify a thesis). As a practical matter, then, transportation measures will be considered in a limited fashion.

5. Pollutants Considered

In analyzing the effects of land use on air quality it is necessary to distinguish between different pollutants. Different sources produce different pollutants and the EPA has identified six major pollutants which must be controlled.* The measures for controlling each pollutant vary considerably in most cases. For example, one set of land use decisions could aim at reducing the level of oxidants but, because the air quality problem in the area is due to particulates, the problem will continue. Some areas may have air quality problems from a number of pollutants, others from only one.

Unfortunately, more is known about the characteristics of some pollutants than others. The following discussion does not really consider the differences between pollutants. This is due in part to the complexity of the issue, in part to the limited information available, and in part to the fact that much of the literature never specifically distinguishes between pollutants.

6. Impacted Areas

One of the problems in evaluating the literature concerned with the relationship between air quality and land use is that, in most cases, a clear identification of the geographical area affected by air pollution is not provided. For example, some land use decisions will only impact a localized area, others an entire region. These distinctions are often not made.

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*The six pollutants identified are Sulfur Dioxide, Carbon Monoxide, Nitrogen Dioxide, Oxidants, Particulates, and Hydrocarbons.



'Remember what I told you, no deep breaths in the city.'

Source: U.S. HEW, No Laughing Matter.

Areas affected by air pollution can be distinguished as follows: (a) the direct source itself--this may be a parking lot or factory emitting pollutants over short or long distances; (b) localized areas or hot spots--these may be busy downtown streets or areas adjacent to a major pollutant source--small areas with heavy air pollution concentrations; (c) subareas--these are somewhat larger areas, such as neighborhoods or even cities, with their own pollution levels and emission sources; and (d) the region--this is the entire air basin and the total of all the subareas and localized areas. Under the Clean Air Act the region must meet federal ambient air quality standards.

While some studies clarify their area of concern and try to identify the potential tradeoffs between, for example, improving the air quality in one subarea but causing greater deterioration in another, most of the material either ignores the distinctions or admits to an inability to consider more than one or two of the areas.

B. The Ways Land Use Affects Air Quality

Although, as F. Stuart Chapin has stated, " . . . to date precious little attention has been given to air quality factors by land use planning agencies,"[5] a number of observers have emphasized that land use does have an important impact on air quality.[6]

This conclusion is almost simplistic considering that land use activities create air quality deterioration in the first place. Croke, et al., argue that economic and

demographic factors as well as development trends lead to environmental degradation: "These include the tendency of industrial and commercial activities toward spatial concentration, the migration of industry under the impetus of improved transportation technology, the growth and redistribution of population which results from natural increase and inter-regional migration, and changing demands for the factors of production, including capital equipment, land, energy, labor and natural resources."[7]

More dramatically, another observer declares, "Air pollution is one of the most pernicious and dangerous consequences of uncontrolled urban growth."[8]

Thus, land use decisions have been seen as creating air pollution problems. It readily follows then that control over land use decisions will lead to improved air quality. By and large, most observers see the greatest value of land use measures as a long term strategy for maintaining rather than achieving air quality standards.[9]

Before discussing specific ways in which land use affects air quality, it may be helpful to briefly describe the general process by which air pollution can be reduced. According to Goodrich, the air quality of a region depends upon the assimilative capacity of the air and the characteristics of pollution emissions.[10] Since little or nothing can be done to affect the air's assimilative capacity, emissions must be controlled to improve air quality. There are two basic ways of controlling emissions. First, the amount of emissions can be reduced

and, second, emissions can be dispersed in order to minimize the impact of their release. The effect of land use on air quality, then, will depend on the ability of land use decisions to bring about the reduction and dispersion of emissions.

Four types of land use decisions will be examined in terms of their perceived impact on air quality: (1) location of land use activities; (2) intensity of land use activities; (3) amount and rate of growth of land use activities; and (4) characteristics of land use activities.

1. Locational Factors

Potentially, the location of land use activities can reduce emissions by shortening the number and length of automobile trips people take as well as by encouraging dispersion of emissions.

A number of authors have commented on the importance of locational factors in terms of air quality. Berry, for example, identified urban forms as a basic variable in determining air quality.[11] He found less air pollution with a core-oriented region having a radial transportation network and a steep density gradient.[12] A more dispersed urban form had more serious environmental problems.[13]

Beaver associated the number and length of trips with the spatial relationship of residential areas to the service, employment and recreational areas which support them. He advocated the mixing of land uses.[14] Other authors have concurred on the importance of mixed uses.[15] Fensterstock, et al. also argued that the spatial pattern of human activity, with

other factors, influences the character of the air pollution problem. They saw different configurations of land use leading to different patterns of air quality. For them, the proper location of airports, open space, parks, and transportation system design can be extremely effective in minimizing air pollution.[16] The idea that land use arrangements influence air quality has been agreed to by a number of authors.[17] The importance of the location of industrial and transportation activities has often been particularly emphasized.[18]

Some authors have stressed the importance of locational factors in encouraging the dispersion of emissions. Kurtzweg argued that both the intensity and distribution of human activity are determinants of the density of air pollution emissions and cited a number of studies that support this view.[19] According to Tolley and Cohen, both air quality and land use have spatial dimensions and the extent of environmental damage depends on the manner in which emissions are dispersed from the source.[20]

While many authors have identified the relationship between urban form and air quality, it has been more difficult to measure the relationship in quantitative terms and to determine with confidence which kinds of spatial distributions were most successful in controlling air pollution. A number of studies have attempted to do this.

Voorhees and Associates, in one report, cited analytical studies of Chicago and Hartford which indicated that alternative projected land use patterns could lead to very different

levels of air pollution. For Hartford, the Single Center alternative had 24 percent more automobile trips than the Balanced alternative.[21] For Chicago, there was potentially a 20 percent difference between two of the plan alternatives over the long run.[22] In a later work, Voorhees, et al. described a study in which eight different urban patterns and four different transit networks were compared.[23] They found that the Satellite City concept with the maximum transit network and basic arterial system yielded the minimum length in miles. In particular, they found that improved transit systems could reduce air pollution 18 percent in the central business district and 1 percent at the periphery of the region.

The Hackensack Meadowlands Study was a major effort to document the relationship between land use activities and air quality. The study evaluated four alternative land use plans which differed in terms of their mix of land uses, relative locations of land uses and intensities of land uses.[24] The study found significant differences between the plans for all pollutants except hydrocarbons. It also found that all land uses except industry and transportation had a negligible impact on air quality. From an air quality point of view, the best alternative land use plan had low population with high density housing, large open space areas, and a broad industrial-commercial mix. The study recommended that large emitters be dispersed.

There have been other analytical studies which have evaluated the impact of alternative land use patterns on air quality

and a number of simulation models have been developed to aid in the task.[25] While all of these have documented that a significant relationship exists, they have, in fact, raised more questions than they have answered.

A number of complicating factors make an understanding of the relationship between land use patterns and air quality extremely difficult.

a. New vs. Fixed Urban Areas. One general factor which severely limits the importance of locational decisions on air quality is that for most areas land use changes are added incrementally to an existing urban layout. The form of most metropolitan areas is largely fixed and urban systems are by and large inelastic.[26] The importance of locational decisions would be greater in creating a new town. This isn't to say that there will not be significant differences between alternative future land use patterns even in a built up area. It just recognizes that the differences will be limited in most cases by the fact that much of the area is already developed, that the existing pattern of development will strongly affect future spatial options, and that change will be slow.[27]

b. Transport. Another difficulty in analyzing the relationship between land use patterns and air quality is the transport problem. The Hackensack Meadowlands study found, for example, that what it called "background" contributed between 65 percent and 99 percent of the total air pollution concentrations.[28] These concentrations were generated in

other regions and were transported into the study area.

The transport problem complicates the analysis of the impact of locational factors on air quality in two ways. First of all, where transport is a major cause of an area's air pollution problem, the potential impact of any land use arrangement will probably be minimal in terms of achieving the air quality standards. As in the Hackensack case, there may well be no way to achieve the standards no matter what land use plan is adopted. In such a situation the local efforts are much more likely to be focused on alleviating the transport problem than on considering alternative land use plans. In fact, as will be discussed later in terms of the Santa Cruz area, the potential importance of transport on air quality can provide a rationale for public officials to ignore the locally created air pollution altogether and to oppose even the consideration of land use alternatives. Second, the transport problem complicates the analysis of locational factors because of the difficulty in measuring its effects. Since, even under the best of circumstances, it is difficult to estimate the potential effects of alternative land use patterns as well, the possible existence of transport in an area will make the analysis even more troublesome than usual.

c. Physical Factors. Both meteorological conditions and topography play an important part in determining an area's air quality. They have a major impact on the patterns of dispersion of pollutant emissions and greatly influence the air's assimilative capacity. In order to accurately measure

the potential impacts of alternative land use plans, therefore, it is necessary to include consideration of these factors. This requires the collection of large amounts of very specific data as well as the development of a complex model. In addition, since wind patterns, climate, and topography are different in each area, it is possible to transfer only the most general conclusions from one study area to another.

d. Complex Interrelationships. The connection between land use patterns and air quality is often not direct.[29] For example, mixing land uses will, hopefully, reduce the number and length of trips or the number of vehicle miles traveled, which will reduce emissions and thereby improve the air quality. However, according to Mead, vehicle miles traveled do not always reflect emissions--the photochemical reactions involved are quite complicated.[30] Moreover, mixing uses may not reduce the vehicle miles traveled. An industrial area may not provide jobs for the people living in the adjacent housing. Nor will these people necessarily shop in an adjacent commercial area, if it is not geared to their needs.[31] Locating housing along transit corridors by itself may not stimulate transit use and localized air quality may deteriorate.[32] One study pointed out that both low density sprawl and high density concentration of development could generate significant air pollution increases.[33]

Indeed, according to one observer, mass transit, itself, could generate new growth and thereby create increased air pollution.[34] New towns, also could induce additional growth

in a region and create increased air quality problems if controls on growth in other areas were not adopted.[35] Land use measures, then, may have contradictory results in terms of air quality.

The point here is that measuring the effect of locational factors on air quality is exceedingly difficult because of other land use and transportation variables which complicate the picture.[36] Any study of this relationship must necessarily begin with a great many assumptions.

e. Impacted Area Problems. This point was made earlier in the section on general qualifications but is particularly relevant here. Most of the studies were undertaken on a regionwide basis. Yet it is important to consider the effect of alternative plans on local areas. One subarea's air quality could improve while another's deteriorates under a particular plan. In some of the models used in the studies it is possible to identify localized differences. Even in these cases, however, the process of evaluation vis a vis locational patterns is extremely complicated.

f. Overlapping Variables. A final problem with comparing the various studies is that most of them evaluate a number of variables at the same time. It is difficult, if not impossible, to identify the effect of the spatial pattern of land use on air quality when factors like population size and mix of uses, for example, are also being compared at the same time.

These complicating factors indicate, if nothing else, that the understanding of the relationship between land use patterns and air quality is still at a fairly rudimentary stage. The few studies that do exist are so diverse in methodology and data that they are difficult, if not impossible, to compare.

Most authors agree with Voorhees, et al. that there are no easy answers[37] and emphasize the need for additional study and more precise knowledge.[38] While some general conclusions may be defensible, they must still be couched with many qualifiers.

2. Intensity of Land Use

The intensity of land use is closely related to the general issue of location and is really a subcategory of it. However, the issue of population density has raised some interesting points and is, therefore, treated separately here.

Early analytical studies seemed to indicate that lower population densities create less pollutants.[39] There was some discomfort with this conclusion in light of other negative effects of "sprawl" and the resultant poorer prognosis for the public transit system, but the results were accepted by some.[40] Others saw a direct connection between sprawl, increased freeway use, and increased air pollution.[41]

With the publication of the Costs of Sprawl came evidence that high density housing development had substantial advantages over low density in terms of air pollution.[42] In fact, the high density example had 53 percent less air quality

deterioration than the sprawl example. The gains in air quality were caused by lower auto usage and reduced air pollution from home heating. Other authors, also, have declared the beneficial effects of high density on transit use.[43]

While the positive effects of high density housing on air quality have become generally accepted, there is still a need for caution. A study of the Boston region found that higher density in the central core as opposed to the periphery did not lead to better air quality. In fact, because most people continued to use their cars and there was less land area for dispersion, the reverse occurred. The authors advised that high density development needed to be coupled with other policies in order to reduce air pollution.[44] A study of a Los Angeles area also found that higher density would increase air pollution.[45] Related to this, another study found that intensity of land uses had only a minor impact on air quality compared to the mix and location of land uses.[46] Finally, it should be remembered that the Costs of Sprawl did not study the real world. Its alternatives were idealized.

A number of factors affect the relationship between higher density and air quality. For example, as mentioned earlier, since, in most cases, land use changes are incremental and housing replacement slow, the magnitude of the impact of higher density housing on air quality could indeed be minor. Moreover, density should be viewed in terms of its locational relationships--its impact often depends on where it is located.[47]

In the end, the impact of population density on air quality depends to a large extent, on the geographical area under consideration. High density residential development, for example, will reduce the absolute amount of air pollutant in comparison to lower density development and will, thereby, have a positive effect on regional air quality. On the other hand, high density development will increase the concentration of air pollution in the immediate area of the source and will, therefore, have a negative effect on localized air quality. While much of the literature considers these differences, the distinction between affected areas is usually not clear.

3. Amount and Rate of Growth of Land Use Activities

The effect of the amount of development on air quality is perhaps the most direct of any land use factor. Obviously, growth, by definition, increases the number of people and activities and thereby the amount of pollutants. Population growth has a particularly close relationship to air quality because of the usual corresponding increase in automobile traffic; and in most areas the primary polluter is the automobile.[48] To restrict population growth, with its attendant increase in automobile traffic, is to restrict the increase in air pollution.

Given the unusually clear relationship between the amount of land use activity and emissions, it is somewhat surprising that more attention has not been paid to this subject. Few studies have considered the independent effects of population growth limits on air quality.[49]

On the other hand, the possibility of controlling an area's growth is a relatively recent consideration. Planners traditionally have (tacitly, at least) approved the concept of growth and have sought to accommodate rather than to restrict it.[50]

Some observers have commented on the possibility of restricting growth on the basis of air quality considerations, though usually in the context of Los Angeles.[51] One study found that it might be possible to reduce vehicle miles traveled there by 20 percent if growth was controlled and land use restricted.[52] Another indicated that the annual rate of emissions increase from growth in the Los Angeles basin would eventually overwhelm even the best control strategy.[53]

One explanation for the reluctance to consider limiting the amount of growth in a region in order to improve air quality stems from the argument that this would merely transfer the problem elsewhere, given the fact that the growth would still occur. There are two reasons why this would not necessarily be the case. First, regions have different climates and topography and the same amount of growth will produce more pollution in some areas than in others. Secondly, some areas have less of an existing air quality problem. If new growth is permitted there but in a fashion which would minimize air pollution, the effects would be very different from allowing the same growth in an already highly polluted area.

The rate of growth can affect the air quality problem in two ways. First, in areas experiencing rapid growth, the

planning function is often inadequate and, in fact, development seems out of control. Under these conditions land use decisions tend to be based on short range economic considerations only and there is small likelihood that any thought will be given to potential air quality impacts. A slowing down of the growth rate in that context can create an opportunity to consider and implement programs to minimize air quality deterioration. Further, it is possible to experience the consequences of certain kinds of development on a limited basis and seek alternatives to those with serious adverse effects. If everything happens too fast, an area can be overwhelmed and find it almost impossible to reverse trends destructive to the environment.

A second way the rate of growth can affect air quality is related to the availability of technological controls. For example, rapid population growth in an area might lead to a population of 500,000 by 1975. With a slower rate of growth, the 1975 population would be 400,000 and it would not be until 1985 that a 500,000 population would be reached. Emission standards, let's say, will reduce the allowable pollution from automobiles by 20 percent between 1975 and 1985. Automobile generated pollution then would be significantly less in 1985 with the same population level, than it would be in 1975. While this is a rather extreme example, it does indicate that limiting the rate of growth can reduce even ultimate pollution levels, by permitting more time for other control measures to become available.

4. Characteristics of Land Use Activities

While the major focus of this thesis is on decisions regarding the location and amount of land use activities, it is undeniable that other kinds of land use decisions will also affect air quality. Performance standards, design considerations, and the like can play an important role. In part, these characteristics of land use activities are not of central concern here for the following reasons. First, performance standards for new stationary sources of pollution, at least in California, are no longer a major concern of local governments. By and large air pollution control districts have taken over this function and local governments are generally satisfied with requiring that a development project receive a permit from the district.

Second, while other characteristics of land use activities, like design for example, are perceived by some as having an effect on air quality, the effect appears to be relatively minor and extremely difficult to measure. Little analytical work has been done in this area.

5. The Ways Land Use Affects Air Quality--Conclusion

As Hagevik, et al., have indicated, relating land use to air quality can involve significant opportunity for error.[54] While there is a growing body of evidence that land use does impact air quality in important ways, much still needs to be learned regarding the precise nature of this relationship. Many conclusions about the relationship--for instance, that mixing land uses reduces air pollution--have been challenged,

at least as absolutes. If there is one general truth that comes from an analysis of the existing literature, it is that the nature of the air quality-land use relationship must be examined on an area by area basis.

It is possible, however, to offer some tentative conclusions about the ways land use affects air quality. Other things being equal, the mixing of land uses, for example, will benefit air quality. Higher density development and, particularly, its location along transit corridors will do so as well. Limitations on the amount of development and the rate of growth will also reduce the air pollution problem.

These conclusions have become, to a large degree, "common knowledge" to planners in the field, despite the fact that the evidence regarding their validity is incomplete and that a number of other factors significantly affect the outcome. One result of the general studies of the air quality-land use relationship, then, has been to create the widespread belief that a number of easily identified land use factors, such as mixed uses, have a positive effect on air quality.

C. Land Use Measures Affecting Air Quality

Despite the limited reliability of the information on the precise relationship between air quality and land use, a number of writers have argued that specific land use strategies and techniques for improving air quality should be implemented.

The purpose of this section is to give a sense of the range and kind of land use control measures which have been advanced. Only a sampling has been selected for discussion in

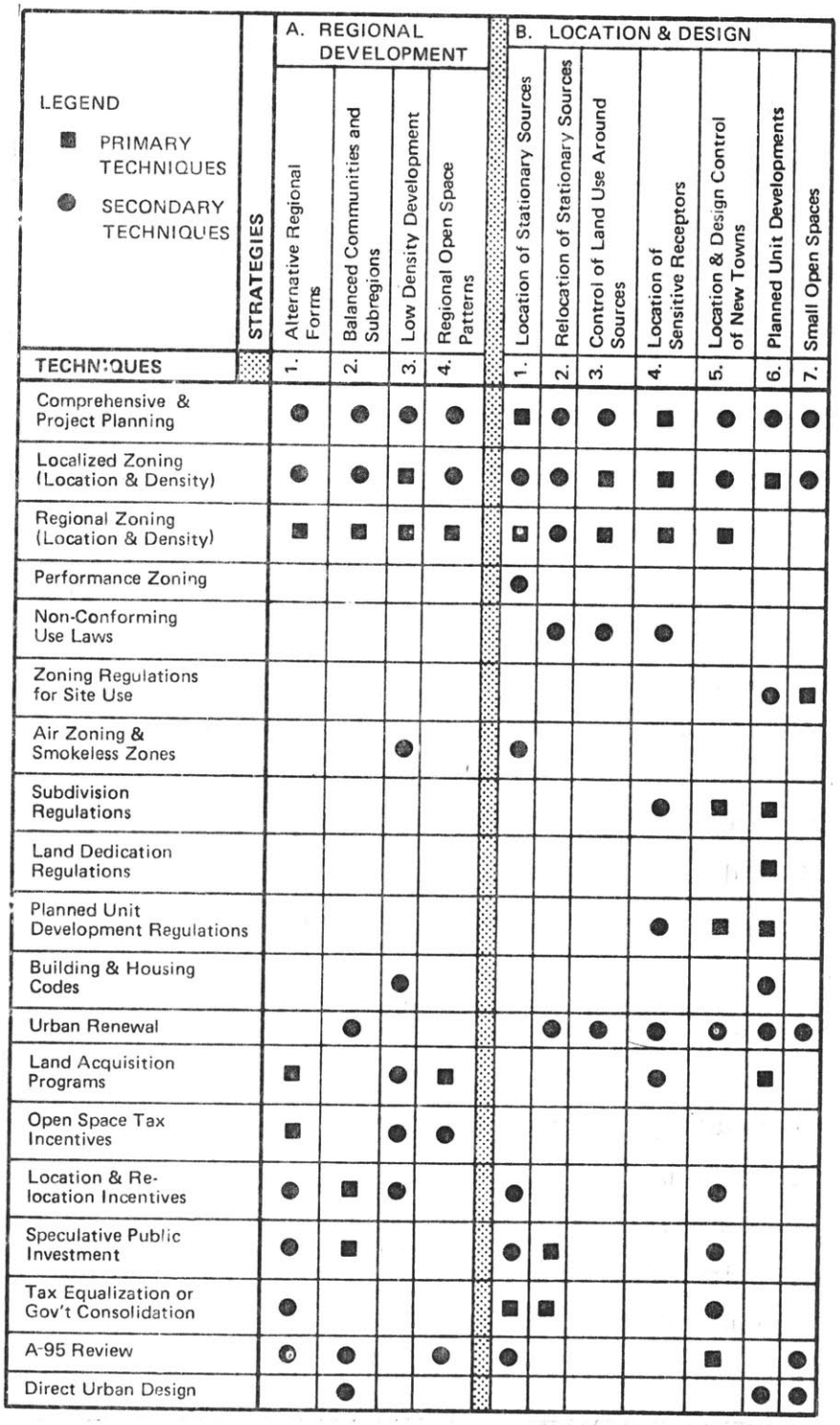
order to indicate the variety of possible approaches. The point here is that these measures are available to planners and that the implementation of specific land use measures in local plans is considered viable by at least a number of observers.

Following Voorhees, et al., the land use measures have been categorized as strategies and techniques.[55] Strategies are broad policies that define a course of action. Techniques are the legal, organizational, functional, and financial tools and processes to implement the strategies. Obviously the boundaries between the two are not always clear cut and other authors, even when they use the same terminology, usually define them differently. As is the case in many other planning areas, this discussion suffers from definitional impreciseness.

1. Land Use Strategies

Voorhees, et al., in A Guide for Reducing Air Pollution Through Urban Planning describes in some detail a variety of land use strategies and techniques for influencing air quality (see Table I).[56] He also attempts to evaluate the importance of some of them. In essence he suggests Regional Development strategies, which include those affecting the location and intensity of land use activities, and Location and Design strategies, which mainly relate to stationary sources. In terms of his proposed techniques, the most important (considered primary for eight strategies) is regional zoning, although it actually exists in the world almost nowhere. No strategies or techniques are offered to explicitly affect the amount of

Table 1.



Urban Planning Strategies and Techniques for Reducing Air Pollution

Source: Voorhees, Alan M. and Associates, Inc. and Ryckman, Edgerley, Tomlinson and Associates. A Guide for Reducing Air Pollution Through Urban Planning.

growth. Also, transportation related measures are not included.

Roberts, Croke and Booras in their review of the effects of air pollution regulations on land use planning identified four categories of land use measures: (1) direct controls on growth; (2) emission limits that may limit growth; (3) review processes to evaluate projects; and (4) preferential tax treatment. They include a table of land use and planning air quality maintenance measures taken from Volume 3 of the EPA Guidelines for Air Quality Maintenance Planning and Analysis (see Table II).[57] They subsequently describe some of these measures briefly and evaluate them in general terms for their effectiveness in reducing air pollution. No explicit distinction is made between strategies and techniques. Taken together these control measures would affect the location, intensity and amount of growth.

Kaiser in Promoting Environmental Quality Through Urban Planning and Control suggests an environmental guidance system made up of decision guides and action instruments.[58] He categorizes his guidance system into four broad components: advice, controls, inducements and development.[59] He includes the environmental impact statement as an example of advice. Under controls, he suggests emission density regulations, emission density zoning, special use permits, air zoning, exclusive use zoning, subdivision regulations, and planned unit developments.

Inducements to private developments to meet air quality standards include tax policies, public land assembly, and

TABLE II.

Air Quality Maintenance Measures

Land Use and Planning Measures

- Emission Allocation Procedures
- Regional Development Planning
- Emission Density Zoning
- Zoning Approvals and Other Indirect Regulatory Controls
- Transportation Controls
- Emission Charges
- Transfer of Emission Source Location
- Indirect Source Review
- Environmental Impact Statements

Emission Control Measures

- New Source Performance Standards
- Revision of Existing SIP Control Measures
- Phaseout or Prohibition of Emission Sources
- Fuel Conversion
- Energy Conservation and Utilization
- Combination of Emission Sources
- Special Operating Conditions
- Stack Height Regulations
- Control of Fugitive Dust Sources

Source: Roberts, J. J., Edward J. Croke, and Samuel Booras. "A Critical Review of the Effect of Air Pollution Control Regulations on Land Use Planning."

public investment programs, such as highways and sewer and water facilities. Finally, development encompasses industrial park provision, open space acquisition and urban renewal.

Kaiser relates each program to a potential improvement in air quality. The connections, however, are made in general qualitative terms and no attempt is made to interrelate the techniques. As a whole, however, Kaiser's strategies and techniques would affect the location, intensity and amount of land use activities.

Beaver in Comprehensive Planning for Air Quality includes a list of strategies for air pollution control, a number of which concern land use (see Table III).[60] Unlike other strategies presented here, his are policy statements. He does not, however, describe the techniques necessary to implement the strategies. While he explicitly discusses the strategies in terms of their potential impact on emission rates and levels, no effort is made to actually evaluate the specific impacts of the different strategies.

Chapin also has briefly outlined a set of strategies for achieving clean air via land use controls. They are "(1) limiting the magnitude of growth of metropolitan areas; (2) controlling the distribution of this growth; (3) regulating the intensity of land use; and (4) controlling the form and design of land development."[61] He does not, unfortunately, assign specific techniques to each of the strategies.

Finally, the planning process itself is offered as a major land use strategy for affecting air quality by a number

Table III.

STRATEGIES FOR AIR POLLUTION CONTROL

Provide Alternatives to Private Auto Travel
- Increase transit capacity
- Attract transit ridership
- Increase para transit use
- Encourage pedestrian and bicycle modes

Improve Vehicular Flow
- Increase vehicle throughput
- Improve urban goods movement
- Reduce peak hour traffic columes
- Divert traffic from high density areas

Reduce Urban Auto Use
- Increase auto occupancy
- Increase cost of auto use
- Restrict zonal access
- Institute parking management plan

Reduce Urban Travel Demand
- Encourage communications substitutes
- Encourage decentralized nodal development
- Encourage four-day work week

Reduce Vehicular Emissions
- Institute front range inspection/maintenance program
- Institute State standards for mobile emission
- Improve street maintenance, pave streets
- Mandate no-lead gas for all vehicles
- Retrofit cars with particulate traps
- Tax cars according to emission generated

Reduce Gasoline Consumption
- Develop urban minicar systems
- Introduce non-petroleum based vehicles
- Tax cars according to gas consumption.

Control Developing Areas of Region
- Institute erosion controls on undeveloped urban lands
- Institute uniform grading requirements within Region
- Develop taxing program consistent with development goals

Develop More Stringent Controls of Point Sources
- Restructure utility pricing
- Increase emission control requirements
- Schedule phase out of most polluting industries
- Develop site criteria for facility location

Source: Beaver, Julian N. Comprehensive Planning for Air Quality Control.

of authors. However, planning as a strategy will be considered later in the chapter as part of the discussion on incorporating air quality concerns into the planning process.

2. Land Use Techniques

Three of the more significant techniques for improving air quality, which have been suggested and are under the control of local government, will now be elaborated upon.

a. Zoning

Zoning is the most commonly suggested technique for improving air quality. Most of the studies reviewed recommended at least one zoning measure.[62]

This is not surprising since local governments have traditionally used their zoning power to control not only land use but air quality as well. In fact, the only land use tool used by localities to improve air quality, until recently, has been zoning. Examples of this include the creation of industrial districts to control the location of polluters and the inclusion of performance standards for industry in the zoning ordinance to limit emissions.

Observers are now recommending additional ways to expand the use of zoning to achieve air quality objectives. For example, Brail, et al. analyzed a number of zoning mechanisms to control emissions on an areawide basis.[63] Their advocacy of emission density zoning, in particular, has received substantial support.[64]

In addition to suggesting new zoning mechanisms, a number of commentators have recommended that the traditional zoning

power be utilized with a specific eye to improving air quality. For example, the importance of zoning in implementing land use plan policies designed to effect air quality has been stressed.[65] The ability of zoning to reduce congestion through the control over the location of land uses has been stated.[66] In particular, zoning can create increased residential densities along transit corridors and, thereby, stimulate transit usage.[67]

Finally, in this regard, zoning affects the amount of development as well as the density and, as a result, impacts the levels of air pollution.[68] One study suggested the possible use of zoning rollbacks to restrict growth.[69] Another study recommended that, as a minimum, zoning should be studied to determine the amount of growth permitted.[70]

Zoning, then through its impact on the location, intensity and amount of land use activity, has been seen as the most potent land use technique available to effect air quality. Precise determinations of this relationship, however, have not been made.

b. Open Space

The provision of open space has often been suggested as another technique for improving air quality. Open space areas have been identified as playing a positive role in the dispersion of air pollutants. The open space techniques recommended have ranged from the setting aside of buffer zones around industrial areas[71] to the establishment of major greenbelts in the region.[72]

The exact magnitude of the role of open space in dispersing pollutants has not been determined. It has not been possible, therefore, to relate the amount of open space levels to the location and concentration of air pollution. Most studies simply indicate that open space is good.

c. Public Investments

Public investment decisions have also been identified as effective mechanisms for influencing air quality through their impact on the location and amount of land use activities. The size, location and timing of an area's infrastructure, such as sewer and water facilities and highways, greatly affects where and how much development will occur.

The studies suggesting the utilization of this technique, however, have not determined the magnitude of its potential effects or related it in a precise way to the alternatives available to a local government.

3. Land Use Strategies and Techniques - Limitations

While many of the land use strategies and techniques outlined above and described in greater detail in the literature appear to be reasonable measures for effecting air quality, the lack of data on their impact when actually implemented substantially limits their usefulness. Moreover, the literature offers, in general, little guidance on exactly how the various techniques should be implemented.

There are other limitations to use of the strategies and techniques. For example, a particular strategy may be successful in one context and counterproductive in another. A buffer

zone on one side of an industrial source when the wind is blowing the wrong way would not only have no positive effect on air quality but would prevent the development of alternative uses in the zone which would not be adversely affected by the industry.

A more significant limitation of the material, though, is that little information has been presented regarding the interrelation of a series of strategies and techniques to achieve overall air quality objectives. A shopping list of land use measures is offered rather than an integrated approach. A related problem is that the strategies and techniques are never compared with each other in terms of their relative importance. Where should the emphasis be placed? Which should be given the highest priority? Under what conditions would one or the other be preferable? While it can be appreciated that quantitative information regarding the impact of the various measures is not yet available, some consideration of their relative significance does seem necessary.

A final limitation of the literature on strategies and techniques is that, usually, they are not related to their areas of impact. Some measures, like greenbelts, probably have their primary impacts on regional air quality. Others, like PUDs, probably have only localized effects. The advocates of the various strategies and techniques, however, rarely identify the areas most likely to be impacted. There is a tendency, then, to oversell the programs.

4. Land Use Strategies and Techniques - Conclusion

The land use strategies and techniques described here do offer a variety of mechanisms (albeit unverified) for effecting air quality. Though adequate documentation of their utility is still lacking, they provide a number of common sense measures to local planners for consideration. In doing this, they send a message to local government that land use measures do exist and are available which can improve air quality and help achieve the goals of the federal air quality program.

On the other hand, a danger with the presentation of the strategies and techniques in the literature is that it often creates the mistaken impression that it is a simple matter to effectively apply land use measures to solve air quality problems. A long shopping list of techniques implies that the tools are there and local agencies need only select the ones most appropriate for them. The tremendous complexity of the air quality-land use relationship and the lack of hard data can easily be overlooked. The task of implementing land use measures to improve air quality, at times, is made to look much less difficult than it actually is.

Despite these limitations, specific land use measures can serve as indicators of the extent to which the air quality-land use relationship has been incorporated in local land use planning decisions. The case study analysis undertaken later will include consideration of a number of the land use measures described here.

D. Integrating Air Quality Considerations into the Land Use Planning Process

This section describes and evaluates several approaches

which have been suggested for integrating air quality concerns into the local land use planning process.

The approaches are included here for two reasons. First, land use planning has been recommended by many as a major strategy for improving air quality and its inclusion continues the discussion of the previous section. The second reason is that the existence of approaches to integrate air quality into land use planning, to the extent that they are viable, would indicate that local governments are able, technically, to include air quality considerations in their land use planning processes, if they so desired. The procedures also could provide specific models which local agencies would be able to adapt to their own needs.

In terms of the first reason, a number of authors have commented on the importance of incorporating air quality considerations in the land use planning process. In most cases, planning is seen as having a role over the long-term in maintaining air quality standards.[73] Voorhees, et al., for example, argue that urban planning decisions have a profound effect on air quality.[74] Goodrich sees them as offering a fundamental means of controlling long-term air quality.[75] For d'Arge, ideally land use planning should identify the extent of environmental problems and the best strategies for solving them.[76] Willis, in the Hackensack Meadowlands study, argues that the planning process is well suited to the consideration of the relationship between air pollution and the many technical, social, economic and political factors that influence

long-term solutions. It also offers a rational, systematic way to integrate air pollution with other concerns.[77] Finally, Beaver expresses the relationship as follows: "Because of the closely associated links within energy systems, transportation systems, and land use activities, coordination of air quality considerations in the planning process is a necessity if there is to be a realistic hope to maintain strict ambient standards for air quality."[78]

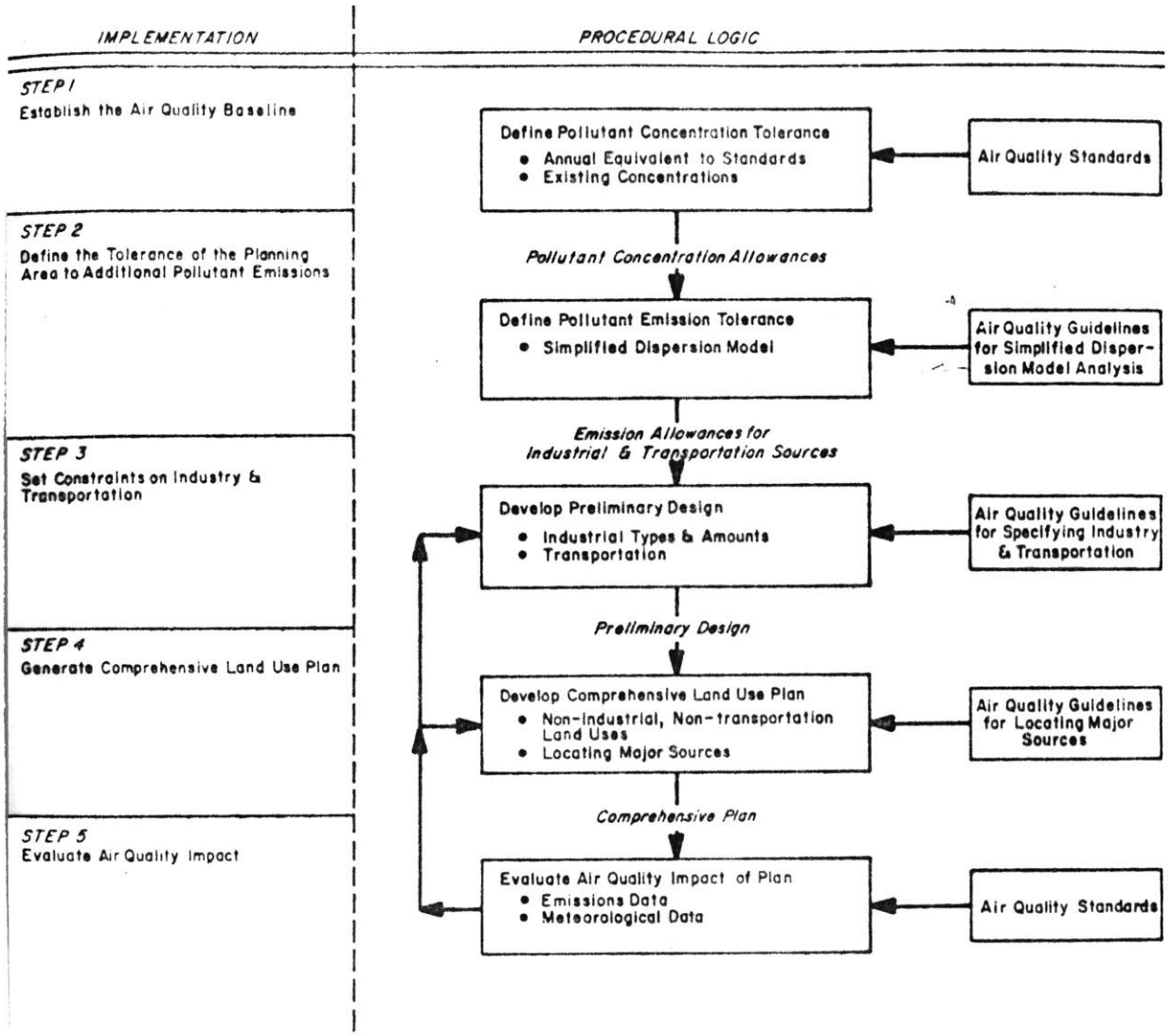
1. Procedures for Integrating Land Use and Air Quality in the Planning Process

The intent in this section is to document the existence of specific procedures, to outline their characteristics in a general way, and to show that at least some of them are available in a form which can be used by planners at the local level. Four alternatives will be presented.

a. The Air Quality Impact--Land Use Planning Process

Epstein, et al., suggested this approach in A Guide for Considering Air Quality in Urban Planning.[79] It involved five steps for incorporating air pollution limits into comprehensive land use plans. Table IV identifies the steps and the procedural logic involved. Briefly, the first step is to define the existing regional air pollutant concentrations. Step 2 determines the allowable increase in concentrations for each pollutant within the planning area in light of ambient air quality standards. Step 3 relates the allowable pollutant increases to different industrial and transportation category mixes and intensities in order to identify the constraints on these uses,

Table IV.



The air quality impact-land use planning process

Epstein, A.H., G. A. Leary and S. T. McCandless. A Guide for Considering Air Quality in Urban Planning.

as they are the ones which most heavily pollute the air. Step 4 distributes the industrial and transportation land uses spatially as part of the development of alternative comprehensive land use plans. Spatial contours of pollutants and dispersion patterns must be considered. Step 5 requires an air quality impact evaluation of the final plan or plans. This is needed, despite the previous inclusion of air quality concerns in preparing the plans, due to the limited information available earlier. With the completion of Step 4 planning data of sufficient detail to perform a more extensive analysis of the air quality impacts becomes available.

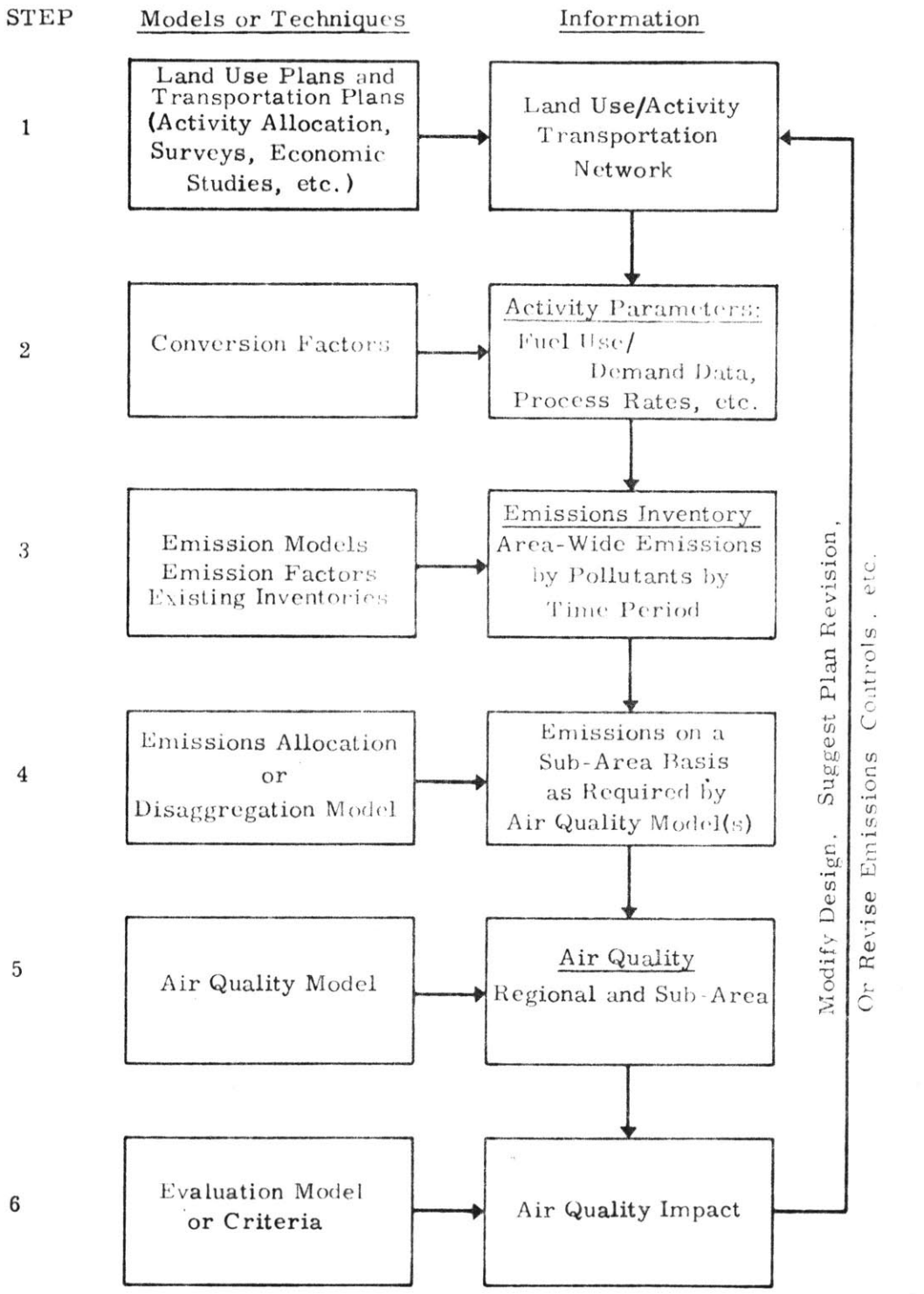
Voorhees, et al., also recommended this process in Volume 4 of the Guidelines for Air Quality Maintenance Planning and Analysis but elaborated somewhat on the information, organization, and analytical tools required to relate the land use plans to air quality. Table V indicates the information requirements. Obviously a number of models are required to generate the necessary information. Overall this is a rather complex process.

b. Comprehensive Regional Planning Process

Beaver in his report Comprehensive Planning for Air Quality Control suggests another regionally based process for integrating air quality and land use.[80] Table VI outlines the process. A number of the models required by the process are described later in his report in general terms. This procedure is probably even more complex than the previous one.

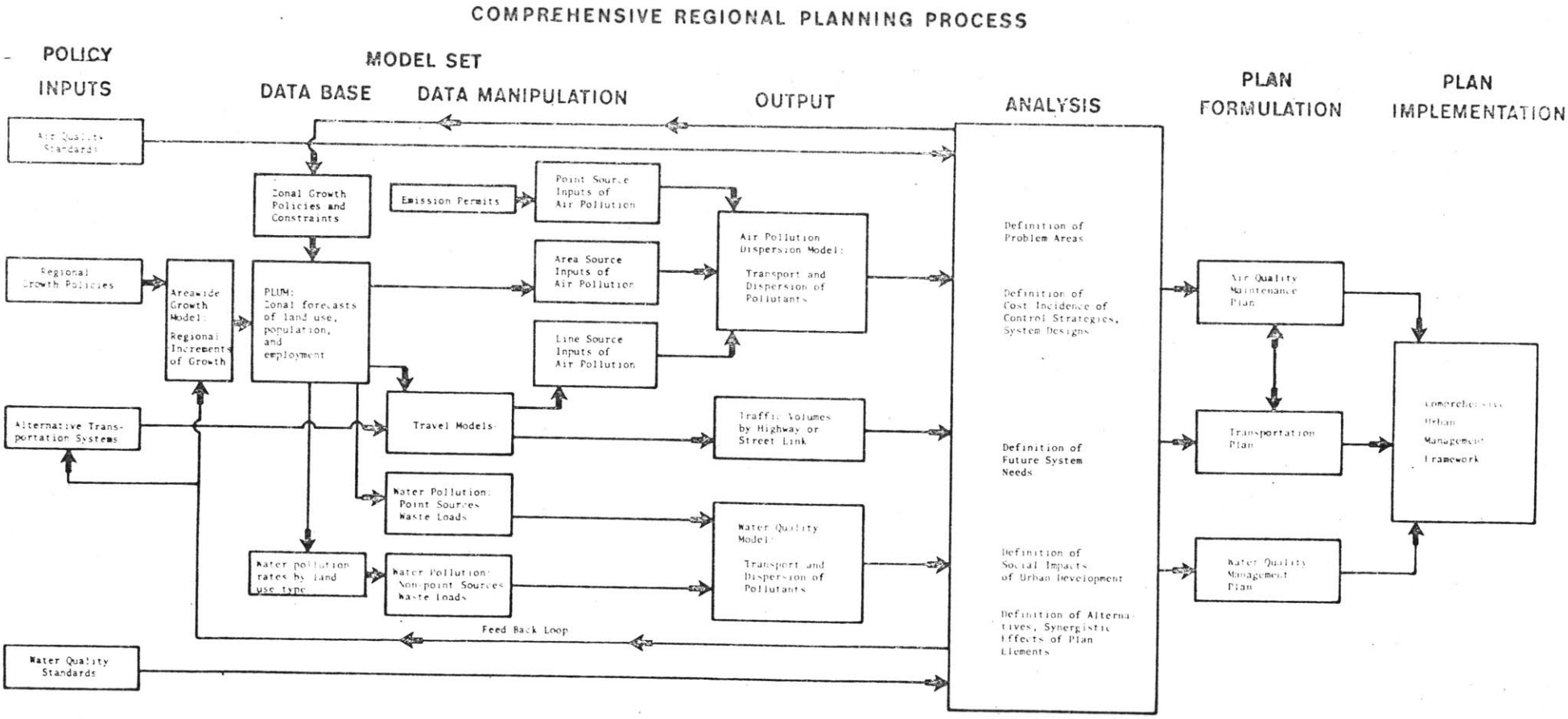
Table V.

INFORMATION ACCESS REQUIREMENTS OF A PROCESS TO RELATE LAND USE AND TRANSPORTATION PLANS TO AIR QUALITY



Source: Voorhees, A. M. and Associates. Guidelines for Air Quality Planning and Analysis, Vol. 4.

Table VI.



Source: Beaver, Julian N. Comprehensive Planning for Air Quality Control...

c. Emission Allocation Planning

Livingston and Blayney suggested this process, although they didn't name it, in a report prepared for the California Legislature and it has been described by other commentators as well.[81] According to the authors, the process was designed "to utilize existing plans, air quality standards, and existing emissions."[82] It also attempted to relate local and regional factors. The procedure involves the following six steps:

- Inventory of planning sub-area emissions. In this step land use and transportation plans are analyzed to determine the emissions likely to be generated by the various sources. These projected emissions are then compared to allowable emission limits.
- Evaluation and revision of land use and transportation plans. Local and regional plans would be revised to meet the allowable emission limits, if they did not already do so.
- Adoption and implementation of plans. Once the plans were adjusted to meet their assigned limits, they would be adopted and implemented by the relevant governing body, local or regional.
- Monitoring Development. Using a refined environment review process, projects and further plans would be monitored to ensure that the emission limits were being met.

Although this process is more complicated than it sounds, it does appear to offer a methodology to consider air quality

concerns as part of the local land use planning process.

d. Land Use Based Strategy

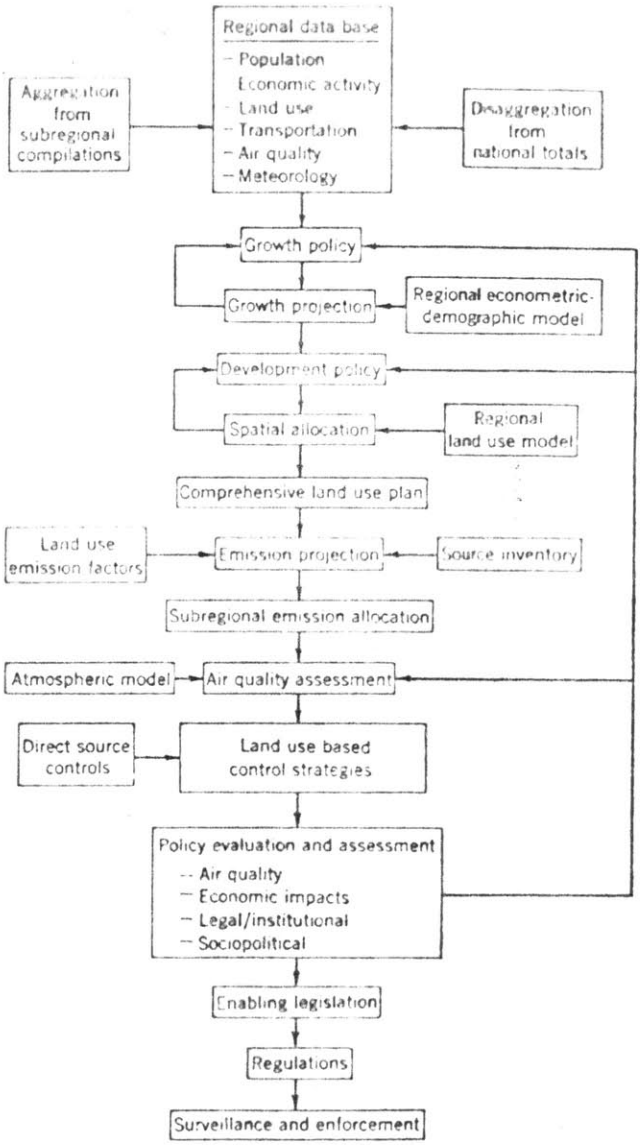
Roberts, Croke and Booras in their article "A Critical Review of the Effect of Air Pollution Control Regulations on Land Use Planning" offer another procedure for integrating land use and air quality concerns into the planning process.[83]

They argue that the popular conception of the close relationship between land use and environmental quality is fallacious because of the potential significance of outside factors which can all but negate the relationship. They then propose that "an appropriate regulatory scheme superimposed on a conventional comprehensive plan could create the desired relationship (between land use and environmental quality)."[84]

They also offer a conceptual methodology adapted in part from the procedure described earlier, presented by Voorhees. This methodology is outlined in Table VII. The authors emphasize that the process outlined has never been realized and that significant methodological and institutional impediments must be overcome before it can be achieved in its entirety. Many elements in the scheme, however, do exist and have been applied.

In the first stage of the process a regional data base must be acquired and organized. The second stage involves the identification of a regional growth policy, which can be based on the decisions of a single agency or a collection of local agencies. The growth must then be allocated to the available land throughout the region based on existing usages and future

Table VII.



The development and implementation of air pollution control strategies based on land use.

Source: Roberts, J. J., Edward S. Croke, and Samual Booras. "A Critical Review of the Effect of Air Pollution Control Regulations on Land Use Planning."

policies and trends. This will ideally result in a comprehensive land use plan in which the location of stationary and mobile sources is implicit.

The next stage calls for the projection of potential air pollution emissions based on land use factors. The objective is a forecast of the magnitude and distribution of future emissions.

Using this forecast, meteorological data and atmospheric modeling techniques, an air quality assessment of the implications of the comprehensive regional land use plan is carried out. This assessment should yield projections of the short and long term ambient concentrations and distributions of the various pollutants.

Land use based strategies would then be developed and combined to form regional air quality management policies to reduce the concentrations as needed. These would then be assessed and evaluated in terms of their air quality impacts, as well as other social, economic, and political consequences.

After examining the impact of the selected policies on regional growth and development through a feedback process, the necessary implementation tools would be developed for those finally chosen.

The authors discuss the data needs and analytical methodologies for this process in some detail presenting a critical evaluation of how it can best be implemented. The process involves fairly extensive data requirements, the ability to utilize models and a fair amount of technical competence in

order to apply it in detail.

2. Evaluation of the Procedures

Although complicated, the approaches outlined above do indicate central elements which an air quality planning process would contain. These include the determination of the existing air quality in an area and of the future air quality deterioration possible before standards would be violated, the analysis of various land use planning alternatives in terms of their potential impacts on air quality, and, finally, the relating of specific land use planning decisions to the future permissible air quality levels.

One advantage of these procedures is that they can be employed in a variety of planning situations. Whether the desire is to integrate air quality concerns at the start of the planning process, to compare a series of proposed land use plan alternatives in terms of their air quality impacts, or to evaluate an existing land use plan for its effect on air quality, each procedure seems capable of the necessary modification.

Another advantage of the approaches is that they offer a mechanism for considering air quality concerns in conjunction with other planning concerns--air quality can be one goal among many. Although some of the procedures put more emphasis on air quality considerations than others, they all provide the opportunity for the inclusion of other concerns in the overall planning process.[85]

However, the processes discussed above do have some serious problems and limitations. Generally, these can be

divided into those concerning procedures and those concerning planning.

a. Procedural limitations

One potentially significant limitation of the planning procedures is their extensive data needs. The Epstein and Beaver proposals, especially, seem to involve major data requirements. It is often unclear how much information and precisely what information is required to make the processes workable. In many areas of the country extensive data bases are unavailable. It is unclear whether this would make it impossible to include air quality and land use concerns in the planning process or would simply lead to cruder, less certain results. Related to this problem, are the issues described elsewhere in this chapter regarding the difficulty of collecting data and interrelating complex sets of variables affecting land use and air quality.[86]

Another concern with the procedures is that, by and large, their application seems to require a good deal of technical knowledge. If this is true, it would severely limit the ability of smaller regions and most urban areas to implement them.[87] The Emission Allocation Planning process does appear to be geared, however, to a large extent, to local application with limited technical knowledge required.

The role of simulation models in the proposed planning processes raises other difficulties somewhat related to the previous ones.[88] Most of the processes require the use of at least one model. A number of studies have identified air

quality and land use models which are available for application as part of the planning process.[89] However, most of these models are complex and require technical knowledge to apply. Further, the transferability of some of the models is often limited. They often have extensive data needs and the absence of one kind of data renders them inoperable. Further, one observer has pointed out that the models utilized must be as specific as the land use strategies under consideration.[90] If the model is too general, the resultant strategies may be too general to implement. While models offer an important resource in the planning process and in some instances are necessities, they are often difficult to use in many regions.

There are also possible inequities built into the proposed approaches. The Emission Allocation Planning process, for example, would, as proposed, tend to discriminate against development in the fringe areas of a region, since it bases the assignment of emission limits on the current level of emissions. The Epstein process could limit commercial land use activities by focusing on industrial and transporation activities.

Related to this is the problem of areas that already exceed air quality standards. The various planning procedures seem to assume continued growth. They do not appear to give adequate consideration to ways of incorporating the possible need to limit the amount of new land use activity. The Emission Allocation Planning process seems to offer greater flexibility in this regard.

An additional problem, which includes some difficulties previously mentioned, concerns the current limitations of the start of the art. To some extent at least, the technology has not been developed yet to adequately consider the complex of factors influencing the land use-air quality relationship.[91]

Finally, a significant problem with the procedures relates to the distinction between how they appear and what they actually involve. A cursory examination of the four approaches, especially if focused on the charts, might leave the impression that only a few relatively simple steps are required in order to integrate air quality concerns into the land use planning process. The fact of the matter is, however, that a serious attempt to implement any of the approaches would quickly bring to light serious problems, some of which have just been outlined. This does not mean that the procedures cannot be utilized by local governments at all but only that their manner of presentation is somewhat misleading. One possible consequence of this problem is to create the impression at both the federal and the local level that applicable procedures for incorporating air quality considerations into land use planning are more readily available than they actually are.

b. Planning Limitations

Some of the limitations to the application of the proposed approaches concern the inadequacies of land use plans themselves. Often little or inadequate data are used in developing local plans.[92] More often the plans are extremely nonspecific in terms of the densities and amounts of proposed land uses.[93]

It is, therefore, impossible to estimate the likely emissions which would be generated. This inadequacy is compounded in many areas where zoning is inconsistent with the land use plan.[94] The land use plan, then, may not really reflect likely future development patterns.

Moreover, there are legitimate questions regarding whether the plans will seriously be implemented and enforced or even updated regularly to reflect changing conditions and objectives.[95] They often are not.

Another problem in applying the proposed processes is political.[96] Plans are almost always compromise documents representing an accommodation by decision makers to a variety of interests. The need for specificity required by the proposed procedures runs counter at times to the need of local officials to blur their decisions in order to please as many people as possible. Related to this is the fact that in many decision makers' minds other activities have a much higher priority than air quality-land use planning or any planning, for that matter.[97] In this regard local decision makers might strongly resist requiring them to implement one of the procedures, since such an approach would require the kind of planning decisions decision makers often wish to avoid. On the other hand, a local government might agree to cooperate with such a planning procedure knowing that the land use planning decisions it will generate will be too general and the results will not threaten its interests.

There is also a funding problem with the procedures. Implementing them is likely to be quite costly. Local decision makers are liable to be reluctant to spend the necessary funds, even if the amount is only a small share of a grant from an outside agency.

Most of these problems are common to every land use planning process. They are only somewhat exacerbated here due to the increased complexity involved in attempting to include air quality consideration in a systematic way.

One serious difficulty with the approaches, however, relates specifically to the air quality problem--this is the regional-local dilemma.[98] Most of the proposed procedures are based on a regional planning process. However, local governments control land use decisions and are more likely to produce meaningful plans than regional agencies. Regional land use plans are notoriously vague and are usually extremely difficult, if not impossible to either quantify or implement.[99] Local plans, on the other hand, are seen as less desirable in terms of the consideration of air quality concerns due to the fact that air quality concentrations are determined on a basinwide (regional) basis. It is obvious, also, that the possibility of institutional conflict abounds in this area.[100] Who controls the assignment of emission levels within the regions? Who coordinates the variety of local plans? Who insures that localities implement the regional land use/air quality plan? These questions are not unresolvable and the Emission Allocation Planning process tries to deal with them.

However, they do present real problems to the meaningful implementation of a planning process integrating air quality and land use concerns. This issue will be considered again later.

3. Evaluation of Planning Procedures--Conclusion

At this time there does not appear to have been enough experience with the planning approaches described herein to determine whether they are capable of successful implementation on a regional or local basis. Certainly, there are many serious problems which could hamper their application. On the other hand, they may be of use, at least in a simplified form, if a local government is willing to make a sincere effort. The discussion of the procedures in the literature has identified the data needs and the significant steps in the process. The impression is definitely left that a serious attempt to implement one of the approaches would be at least partially successful.

However, perhaps the clearest conclusion that can be drawn from this discussion is that the process of incorporating the air quality-land use relationship in the planning process is extremely complicated, and can only be used with great difficulty, if at all, in attempting to alleviate air pollution problems. However, when viewed in the context of government's difficulty in controlling most of the basic variables in the planning process, such as technology, affluence, mobility, etc., the limitations of the approaches considered here appear somewhat less monumental.

E. The Relationship Between Air Quality and Land Use--Conclusion

Although understanding regarding the relationship of land use to air quality and the availability of information for implementing air quality-land use concerns in the planning process is at a rudimentary stage, certain (albeit cautious) generalizations regarding the relationship of land use and air quality are probably justified. For example, mixing of land uses, high density development, and limitations on growth will probably benefit air quality in most cases. Emission density zoning and decisions regarding public investments, also, are probably useful techniques for controlling air pollution and local planners could consider these in their planning programs. The case studies presented later will consider the extent to which they were included in one locale.

Similarly, despite their numerous difficulties, the procedures for integrating air quality and land use considerations into the planning process probably can, in many cases, be utilized even if in a simplified manner. Unfortunately, none of these were used in planning processes analyzed in the case studies, although it appears that they could have been. Their absence probably is more indicative of the level of commitment rather than the level of technology.

Even if the material presented here is evaluated pessimistically as having little substance, the work done thus far on the relationship between air quality and land use seems to have created among many planners the belief that a relationship

exists and that the general policy statements and control measures suggested above regarding this relationship are true. To the extent that local governments receive the information on the nature of the air quality-land use relationship and the procedures for incorporating it into the planning process, they can no longer plead ignorance and are thus put under pressure to consider it in their own planning activities. Federal efforts to bring this information to the attention of local agencies represent one way that federal influence can be expanded on the local level. Moreover, the existence of viable land use measures and planning approaches can support a federal contention that local land use planning should incorporate air quality concerns. This also, then, fosters the expansion of federal influence.

On the other hand, local governments may effectively resist the pressure to consider the air quality-land use relationship by concentrating on the limitations of the existing knowledge and/or the difficulties in undertaking an adequate planning process. In which case, the problems discussed in this chapter can well be used as excuses for inaction.

The federal role in generating the information on the relationship between land use and air quality and making this information available to the local government has been significant.[101] Although a detailed analysis has not been made, it appears that every major study since the late 1960s concerning the air quality-land use relationship has been funded in whole

or in part by the federal government. The federal government, also, appears to have sponsored or co-sponsored, and has helped to finance the major conferences where papers on the land use-air quality relationship were presented. Moreover, the procedures developed for integrating air quality and land use into the planning process were developed, either directly or indirectly, by the federal government. Even before the 1970 Clean Air Amendments required the consideration of land use controls. HUD had funded a major study of the effects of land use on air quality under the 701 planning grant program.[102] This is not to say, however, that planners have not interested themselves in the relationship apart from federal support because, to some extent, the connection between land use and air quality has been recognized by planners for many years.

It does appear likely, however, that the land use implications of the 1970 Amendments and the regulations that followed stimulated a great deal of the activity in the field. With the federal requirements, which will be discussed in the next chapter, it became critical at both the federal and local level for a better understanding of the air quality-land use relationship to be developed.

Certainly, then, the level of knowledge that currently exists in this area was largely stimulated by the federal government. Whether the activity that has been generated to further that knowledge will continue in the future should federal funds dry up or federal interest wane, due to the changes in the 1977 Clean Air Amendments, raises interesting questions

regarding the advancement of knowledge in the planning field.

The next chapter will consider in some detail the history of the federal air quality program including those aspects of it which have provided to both the federal and local governments the incentive to increase their understanding of the air quality-land use relationship. The case studies will, finally, seek to investigate federal influence via, in part, the air quality-land use relationship on local land use planning decisions.

Notes

[1]J. J. Roberts, Edward J. Croke, and Samuel Booras, "A Critical Review of the Effect of Air Pollution Control Regulations on Land Use Planning," Journal of the Air Pollution Control Association (25:5 (May, 1975): 500.

[2]See, for example, Ibid., pp. 500-501 and Gregory K. Ingram and Mary R. Fauth, TASSIM: A Transportation and Air Shed Simulation Model, Volume I: A Case Study of the Boston Region (Cambridge, Massachusetts: Harvard University Press, 1974), p. 61.

[3]James E. Krier and Edmund Ursin, Pollution and Policy (Berkeley, California: University of California Press, 1977), pp. 11-12.

[4]See, for example, Edward J. Croke, Kevin G. Croke and Allen S. Kennedy, "The Impact of Urban Growth and Development on the Achievement of Air Quality Standards" in George Hagevik (ed.), The Relationship of Land Use and Transportation Planning to Air Quality Management (New Brunswick, New Jersey: Center for Urban Policy Research, Rutgers University, 1972) 207; E. J. Kaiser, Promoting Environmental Quality Through Urban Planning and Controls (Washington, D.C.: U.S. Environmental Protection Agency, 1974) 376; Allen S. Kennedy, et al., Air Pollution--Land Use Planning Project, Phase 1, Final Report (Chicago: Argonne National Laboratory, Center for Environmental Studies, November 1971), 13; Edward J. Croke, "An Evaluation of the Impact of Land Use on Environmental Quality" in Donald M. McAllister (ed.) Environment: A New Focus for Land-Use Planning (Washington, D.C.: National Science Foundation, October 1973), 220; and TRW, Inc., Development of a Sample Air Quality Maintenance Plan for San Diego. (Redondo Beach, California: TRW, Inc., September, 1974), 101.

[5]F. Stuart Chapin, Jr., "Summary Remarks" in Maynard M. Hufschmidt and Asta C. Cooper (eds.) Proceedings of the National Conference on Land Use Planning, Transportation Planning and Air Quality Management--November 13-15, 1974 (Chapel Hill, North Carolina: Triangle Universities Consortium on Air Pollution, March, 1975), 219.

[6]See George Hagevik, "Land Use and Transportation Planners Deal with Air Pollution: An Overview" and Salvatore J. Bellomo, "A Program for Considering Air Quality in Urban Planning and

transportation: A Summary" in George Hagevik (ed.), op. cit.,pp. 4 and 155; Allen S. Kennedy, et al., op.cit. p. 11; Livingston and Blayney, A Report on Guidelines for Relating Air Pollution Control to Land Use and Transportation Planning in the State of California" in California Air Resources Board, A Report to the Legislature on Guidelines for Relating Air Pollution Control to Land Use and Transportation Planning in California (Sacramento, California: Air Resources Board, August 1973), 1; Croke, op. cit., 217; TRW, Inc., op. cit.,p.64; and Daniel R. Mandelker and S. B. Rothschild, "The Role of Land-Use Controls in Combating Air Pollution under the Clean Air Act of 1970," Ecology Law Quarterly, V.3 (Spring 1973): 235.

[7]Croke, Ibid., p. 207.

[8]Julian N. Beaver, Comprehensive Planning for Air Quality Control (Colorado Springs, Colorado: Pikes Peak Area Council of Governments, January 1978), p. 2.

[9]See, for example, Croke, op. cit., p. 207; and John C. Goodrich, et al., Air Quality for Urban and Industrial Planning (Lexington, Massachusetts: Environmental Research and Technology, Inc., March 1974), p. 72.

[10]Goodrich, Ibid., p. 72.

[11]Brian J. L. Berry, et al., Land Use, Urban Form and Environmental Quality (Chicago, Illinois: Chicago University, Department of Geography, 1974), p. 426.

[12]Ibid., p. 412.

[13]Ibid., p. 406.

[14]Beaver, op. cit., p. 30.

[15]See, for example, William J. Pelle, Jr., "Survey of Land Use Planning Tools for Dealing with Air Pollution," in George Hagevik (ed.)., op. cit., p. 201.

[16]J. C. Fensterstock, J. A. Kurtzweg and G. Ozolins, "Reduction of Air Pollution Potential Through Environmental Planning," Journal of the Air Pollution Control Association, 21 (July 1971): 396.

[17]See, for example, Hagevik, op. cit., p. 6; Bellomo, op. cit., p. 155; Croke, op. cit., p. 226; Ralph A. Mead, "Air Quality Considerations and Local Land Use Planning" in Elaine T. Hussey, et al. (eds.), Proceedings of the Conference Air Quality Impact Analysis for Application in Land Use and Transportation Planning. June 24-26, 1974 (Berkeley, California: University of California, Continuing Education in City, Regional and Environmental Planning, September 1975) p. 59; C. Peter

Rydell and Benjamin H. Stevens, "Air Pollution and the Shape of Urban Areas," Journal of the American Institute of Planners, Vol. 34, No. 1 (January 1968); Byron H. Willis, Hackensack Meadowlands Air Pollution Study-Summary Report (Lexington, Massachusetts: Environmental Research and Technology, Inc., July 1973), p. 76; and Richard K. Brail, D. R. Mandelker, T. A. Sherry, and G. Hagevik, Emission Density and Allocation Procedures for Maintaining Air Quality (New Brunswick, New Jersey: Rutgers University, Center for Urban Policy Research, June 1975), pp. 4-10.

[18]See, for example, Mead, Ibid., p. 59; Fensterstock, Kurtzweg and Ozolins, op. cit., p. 397; Willis, Ibid., p. 69; and George S. Tolley and Allan S. Cohen "Air Pollution and Urban Land Use Policy" Journal of Environmental Economics and Management, 2 (April, 1976): 248.

[19]Jerry A. Kurtzweg, "Urban Planning and Air Pollution Control: A Review of Selected Recent Research," Journal of the American Institute of Planners, v. 39, n. 2 (March, 1973): 85 (cited subsequently as Kurtzweg (1973)).

[20]Tolley and Cohen, op. cit., p. 247.

[21]Alan M. Voorhees and Associates, Inc. and Ryckman, Edgorley, Tomlinson and Associates, A Five-Year Program to Incorporate Air Pollution Considerations in Urban and Transportation Planning (McLean, Virginia: Alan M. Voorhees and Associates, Inc., 1974), pp. 3-8 (cited subsequently as Voorhees--A Five-Year Program).

[22]Ibid., pp. 3-9.

[23]Alan M. Voorhees and Associates and Ryckman, Edgorley, Tomlinson and Associates. A Guide for Reducing Air Pollution through Urban Planning (Washington, D.C: U.S. Environmental Protection Agency, December, 1971), p. 3-3 (cited subsequently as Voorhees - A Guide).

[24]Willis, op. cit., p. 56.

[25]See, for example, Ingram and Fauth, op. cit.; Voorhees - A Guide, op. cit., describes some of these studies and Roberts, Croke, and Booras, op. cit., evaluates them.

[26]See Beaver, op. cit., p. 91.

[27]V. Petrites, et al., The Effect of Growth and Transportation Alternatives on Bay Area Air Quality (Berkeley, California: Metropolitan Transportation Commission, July 1976), p. 2, for example, found small differences in air quality between three 1990 alternative development patterns primarily because of existing densities.

[28]Willis, op. cit., p. 68.

[29]See, for Example, Willis, ibid., pp. 78-79; Rydell and Stevens, op. cit.; and Mead, op. cit., p. 51.

[30]Mead, ibid., p. 68.

[31]Melville C. Branch and Eugene Y. Leong (eds.), Research Investigation: Air Pollution and City Planning: A Case Study of a Los Angeles District Plan (Los Angeles, California: UCLA, Environmental Science and Engineering, 1972) makes this criticism of a district plan in Los Angeles. Also, see Mead, op. cit., p. 54.

[32]See Ingram and Fauth, op. cit., and Voorhees - A Guide, op. cit., pp. 3-7.

[33]Branch and Leong, op. cit.

[34]Mead, op. cit., p. 59.

[35]Ibid., p. 59.

[36]Petrites, op. cit., also makes this point.

[37]Voorhees - A Guide, op. cit., p. XII.

[38]See, for example, Kurtzweg (1973), op. cit., p. 82.

[39]See, for example, Willis, op. cit., comments on industrial dispersion.

[40]Voorhees - A Five-Year Program, op. cit., pp. 3-9.

[41]Leland S. Burns, "Urban Planning Aspects of Air Pollution Abatement" in Project Clean Air: Task Force Assessments, Vol. 3 - The Contribution of the Social Sciences to the Solution of the Air Pollution Problem (Berkeley: University of California, 1970), pp. 7-14.

[42]Real Estate Research Corporation, The Costs of Sprawl (Washington, D.C.: Supt. of Documents, April, 1974).

[43]See Beaver, op. cit., p. 30 and Pelle, op. cit., p. 201.

[44]Ingram and Fauth, op. cit., p. 4.

[45]Branch and Leong, op. cit.

[46]Willis, op. cit., p. 78.

[47]Mead, op. cit., pp. 53-54.

[48]Mead, ibid., p. 49.

[49]In Willis, op. cit., different population levels were one of a number of variables which were included in each alternative development plan. See also California Air Resources Board, Land Use Planning Program, Assessment of Air Quality Impact of Two Scenarios for the Development of the State of California (Sacramento, California: California Air Resources Board, August, 1974).

[50]Burns, op. cit., p. 7-3.

[51]George Hagevik, Daniel Mandeleker and Richard Brail. The Contribution of Urban Planning to Air Quality (New Brunswick, New Jersey: Rutgers University, The Center for Urban Policy Research, February, 1974), p. 9-2 (cited subsequently as Hagevik - Contribution).

[52]Robert O. Watkins, James B. Borden, and Fred F. Kirchner, "Can Vehicle Travel Be Reduced 20 Percent in the South Coast Air Basin?" Air Quality Environmental Factors, No. 492 (1974).

[53]Lester Lees, et al., Smog: A Report to the People (Los Angeles, California: California Institute of Technology, Environmental Quality Laboratory, 1972), p. 94.

[54]Hagevik - Contribution, op. cit., p. 1-7.

[55]Voorhees - A Guide, op. cit., p. 2-2.

[56]Ibid.

[57]Roberts, Croke and Booras, op. cit., p. 507.

[58]Kaiser, op. cit., p. 11.

[59]Ibid., p. 380ff.

[60]Beaver, op. cit., pp. 53-54.

[61]Chapin, op. cit., p. 219.

[62]See Voorhees - A Guide, op. cit., pp. 2-18, 19; Burns, op. cit., p. 7-5; Allen S. Kennedy, et al., Interagency Cooperation in Comprehensive Urban Planning and Air Quality Maintenance (Washington, D.C.: U.S. Environmental Protection Agency, March, 1974), p. 18 (cited subsequently as Kennedy - 1974); Jerry A. Kurtzweg, Land Use Planning and Air Pollution Control in the Puget Sound Region (Washington: King County Planning Department, Puget Sound Governmental Conference and Puget Sound Air Pollution Control Agency, 1967), p. 1 (cited subsequently as Kurtzweg (1967); and Dorn C. McGrath, "Planning and Zoning - Can They Be Made to Work for Clean Air?" in the Proceedings: The National Conference on Air Pollution, December 12-14, 1966 (Washington, D.C.), p. 554.

[63]Brail, et al., op. cit., p. 1-1 and following.

[64]See Kaiser, op. cit., pp. 381-2; E. J. Croke, and J. J. Roberts, "Land Use as an Organizational Basis for Regional Air Resources Management " in H. M. Englund and W. T. Berry (eds.), The Proceedings of the Second International Clean Air Congress (New York and London: Academic Press, 1971), p. 1248; Kathleen King, "Federal Land Use Controls for Clean Air," Environmental Affairs V.3 n.3 (1974): 514; John J. Roberts, "Data Requirements for the Design and Implementation of Strategies for Maintenance of Clean Air Goals," in Maynard M. Hufschmidt and Asta C. Cooper (eds.), Proceedings of the National Conference on Land Use Planning, Transportation Planning and Air Quality Management November 13-15, 1974 (Chapel Hill, North Carolina: Triangle Universities Consortium on Air Pollution, March, 1975), p. 192.

[65]See, for example, Alan M. Voorhees and Associates, Guidelines for Air Quality Maintenance Planning and Analysis - Volume 4: Land Use and Transportation Considerations (Washington, D.C.: U.S. Environmental Protection Agency, August 1974), pp. 5 and 21-22 (cited subsequently as Voorhees - Guidelines). Also of interest is Kurtzweg (1973), op. cit., p. 83.

[66]Ronald Venezia, "The Relation of Land Use and Transportation Planning to Air Quality Management" in George Hagevik (ed.) The Relationship of Land Use and Transportation Planning to Air Quality Management (New Brunswick, New Jersey: Rutgers University, The Center for Urban Policy Research, 1972), p. 23.

[67]TRW, Inc., op. cit., p. 64.

[68]See Fred C. Hart, "Air Quality Management Using Land Use and Transportation Planning and Control" in Maynard M. Hufschmidt and Asta C. Cooper (eds.), Proceedings of the National Conference on Land Use Planning, Transportation Planning, and Air Quality Management November 13-15, 1974 (Chapel Hill, North Carolina: Triangle Universities Consortium on Air Pollution, 1975).

[69]Lees, op. cit., p. 121.

[70]Branch and Leong, op. cit.

[71]See, for example, Kenneth L. Johnson, "The Transportation and Land Use Elements in State Air Quality Implementation Plans" in George Hagevik (ed.), The Relationship of Land Use and Transportation Planning to Air Quality Management (New Brunswick, New Jersey: Rutgers University, The Center for Urban Policy Research, 1972), p. 15; Hagevik - Contribution, op. cit., p.]-9; and Beaver, op. cit., p. 27.

[72]See, for example, Voorhees - A Guide, op. cit., pp.XII and 2-13; and Robbins, et al., "Detoxiculture and Urban Air

Pollution," Journal of Environmental Planning and Pollution Control, 1(3) (1973): 46-49.

[73]See, for example, Normal L. Cooper, "Transportation and Metropolitan Air Quality" in Maynard M. Hufschmidt and Asta C. Cooper (eds.), Proceedings of the National Conference on Land Use Planning, Transportation Planning, and Air Quality Management, November 13-15, 1974 (Chapel Hill, North Carolina: Triangle Universities Consortium on Air Pollution, 1975), p. 107; Clarence Davies, III, Politics of Pollution (New York: Pegasus, 1970), p. 216; Fensterstock, Kurtzweg and Ozolins, op. cit., p. 395; Hagevik - Contribution, op. cit., p. 1-3; Croke, op. cit., p. 207; Hart, op. cit., p. 66, David A. Lynn, Air Pollution - Threat and Response (Reading, Massachusetts: Addison-Wesley, 1976), p. 299; and Robert E. Trumbole, et al., "A Summary of Clean Air Act Oversight Hearings" in U.S. Senate Subcommittee on Environmental Pollution of the Committee on Public Works, Hearings on the Clean Air Act, 1975, March 19, 20, April 21, 22, 23, 1975 (Washington, D.C.: Library of Congress, June, 1975), pp. 80-81. Harvey S. Perloff argues that although planners are finally considering national resources, they have not yet produced useful concepts or tools in "Urban Planning and the Quality of the Urban Environment" in A. Downs, et al. (eds.), The Political Economy of Environmental Control (Berkeley, California: University of California Press, 1972).

[74]Voorhees - A Five Year Program, op. cit., p. 1-2 and Bellomo, op. cit., p. 155.

[75]Goodrich, op. cit., p. 72.

[76]Ralph C. D'Arge, "Economic Policies, Environmental Problems, and Land Use" in Donald M. McAllister (ed.), Environment: A New Focus for Land-Use Planning (Washington, D.C.: National Science Foundation, October 1973), p. 180.

[77]Willis, op. cit., p. 1.

[78]Beaver, op. cit., p. 13.

[79]A. H. Epstein, G. A. Leary and S. T. McCandless, Guide for Considering Air Quality in Urban Planning (Washington, D.C.: U.S. Environmental Protection Agency, March, 1974), p. 32.

[80]Beaver, op. cit., p. 15.

[81]Livingston and Blayney, op. cit., p. 30 and following; Hagevik - Contribution,op. cit., p. 9-18 and following; Brail, op. cit., p. 1-4; and George Hagevik, "Institutional Issues in Air Quality Management" in Elaine T. Hussey, et al. (eds.), Proceedings of the Conference Air Quality Impact Analysis for Application in Land Use and Transportation Planning June 24-26, 1974 (Berkeley, California: University of California, Continuing Education in City, Regional and Environmental Planning,

September, 1975), p. 41.

[82]Livingston and Blayney, ibid., p. 30.

[83]Roberts, Croke and Booras, op. cit., p. 510.

[84]Ibid., p. 510.

[85]See, for example, the following for discussions of the importance of relating air quality to other concerns: Maynard M. Hufschmidt, "Environmental Quality as a Policy and Planning Objective," Journal of the American Institute of Planners, V.37 (July, 1971): 231-242; and Trumbole, et al., op. cit., p. 78.

[86]See the following for discussions of data problems: Fensterstock, Kurtzweg and Ozolins, op. cit., p. 396; Hagevik - Contributions, op. cit., p. 11-6; Brail, op. cit., pp. 4-6 and 4-16; Voorhees - A Five Year Program, op. cit., p. 1-2; Epstein, Leary and McCandless, op. cit., p. 100; and Kennedy, et al., Air Pollution - Land Use Planning Project,op. cit.

[87]For discussions of this problem, see Hagevik - Contribution, ibid., p. 11-6; and Steve Carter, et al., Environmental Management and Local Government (Washington, D.C.: U.S. Environmental Protection Agency, 1974), pp. 78-80.

[88]For discussions of the use of models see Beaver, op. cit., p. 36; Voorhees - A Five Year Program, p. 3-7; and Epstein, Leary and McCandless, op. cit., p. 100.

[89]The following describe and evaluate a number of available models: Voorhees - Guidelines, op. cit., Appendices A and B; and California Air Resources Board, Air Quality, Land Use and Transportation Models - Evaluation and Utilization in the Planning Process (Sacramento, California: California Air Resources Board, July, 1974), pp. 140 and following. For examples of detailed descriptions of specific models, see also Ingram and Fauth, op. cit., p. 2; Willis, op. cit., p. 31; Frank Benesh, Peter Guldberg, and Ralph D'Agnostino Growth Effects of Major Land Use Projects: Volume III - Summary (Cambridge, Massachusetts: Walden Research Division of Abcor, 1976), p. 1-1; James L. McElroy, A Numerical Model of the Nocturnal Urban Boundary Layer (Triangle Park, North Carolina: North Carolina Division of Meteorology, 1971); and Gerald I. Nehman, John M. Griffin and Kenneth M. Duke, "Land Use and Environmental Planning," Residential Outlook, 7(1)(1975): 21-25.

[90]Voorhees - Guidelines, op. cit., p. 62.

[91]See the following for discussions of state of the art limitations: Brail, op. cit., p. 5-5; Carter, et al., op. cit., pp. 78-80; Epstein, Leary and McCandless, op. cit., pp. 100-101; Bellomo, op. cit., p. 155; Roberts, Croke, and

Booras, op. cit., p. 501; TRW, op. cit., p. 60; and Paul C. Watt and Wayne Hoffman, "An Experience in Relating Transportation, Land Use, and Air Quality Planning" in Maynard M. Hufschmidt and Asta C. Cooper (eds.), Proceedings of the National Conference on Land Use Planning, Transportation Planning, and Air Quality Management, November 13-15, 1974 (Chapel Hill, North Carolina: Triangle Universities Consortium on Air Pollution, 1975), p. 45.

[92]Hagevik in Hussey, op. cit., pages 41 and 45, discusses this problem.

[93]The need for specific, mappable plans is also considered by the following: Mead, op. cit., p. 66; Voorhees - Guidelines, op. cit., pp. 28-29; and Watt, op. cit., p. 46.

[94]See, for example, Voorhees - Guidelines, op. cit., pp. 28-29 on the importance of zoning consistency.

[95]See, for example, ibid., pp. 28-29 on updating plans. See the following on plan implementation: Brail, op. cit., p. 5-5; Carter, et al., op. cit., p. 59; Croke, op. cit., p. 234; Bruce D. McDowell, "Land Use Controls and the Federal System," in R. W. Burchell and D. Listokin (eds.), Future Land Use (New Brunswick, New Jersey: Rutgers University, The Center for Urban Policy Research, 1975), pp. 43-57; and Roberts, Croke and Booras, op. cit., p. 510.

[96]See the following on political problems: Hagevik in Hussey, op. cit., p. 45; and Voorhees - Guidelines, op. cit., pp. 27-28. Hagevik - Contributions, op. cit., p. 11-9, argues that the political problem is the most important one.

[97]Hagevik - Contribution, ibid., p. 11-5 mentions this.

[98]See the following on regional concerns: Hagevik - Contribution, ibid., p. 7-6 and Kurtzweg (1967), op. cit.

[99]Hagevik in Hussey, op. cit., p. 45 cites this concern.

[100]See ibid., p. 45 for a discussion of this problem.

[101]See Hagevik - Contribution, op. cit., p. 11-6 for a discussion of the federal role.

[102]McGrath, op. cit., p. 555.

III.

FEDERAL AIR QUALITY LEGISLATION

"the prevention and control of air pollution at its source is the primary responsibility of States and local government";

"Federal financial assistance and leadership is essential for the development of cooperative Federal, State, regional, and local programs to prevent and control air pollution."

Section 10(a) 1970 Clean Air Act Amendments

A. Introduction

This chapter traces the history of the federal air quality legislation and its implementation. Particular emphasis is placed on the land use implications of the federal program.

The expanding influence of the federal government in the area of air quality control is a central theme of this chapter. The shifting role of local government through the years and the dynamic tension between all governmental levels are also important concerns.

The significant changes in governmental activity occurred in the context of a growing awareness of the seriousness of the air pollution problem. The increased understanding of the public health dangers resulting from the deterioration of air quality and the continuing spread of the air pollution problem provided the basis for public support for expanded governmental activities at all levels. Dramatic air pollution events were particularly important. At the same time there has been an ongoing search for governmental effectiveness;

and, if nothing else, governmental activity has accounted for the great increase in the understanding of both the seriousness and the complexity of the problem of air pollution.

B. Early Air Pollution Control Efforts

The first recorded attempt to control air pollution occurred in England in 1273 with the passage of a smoke abatement law in response to the popular belief of the time that food cooked over burning coals was "prejudicial to health."[1] Air quality problems in the United States were a consequence of the industrial revolution. In the late 1800's, the concern was focused on smoke and was seen almost totally as a State and local responsibility.

The first governmental activity appears to have occurred in 1869 when the State of Massachusetts established legislative authority for controlling air pollution.[2] In 1881, Chicago and Cincinnati became the first cities to enact smoke control ordinances.[3] The Chicago ordinance sought to control dense smoke in the city.[4]

Through the years, other cities enacted smoke control ordinances but the first modern air pollution program was started in Los Angeles in 1947.[5] The Los Angeles program was created under a California law which authorized the establishment of local Air Pollution Control Districts with authority to make and enforce necessary rules and regulations against stationary sources of air pollution.[6] Oregon followed California's lead in 1951.[7]

California, in fact, had the strongest air quality legislation of any state through the 1950's and 1960's. This is not surprising in light of the smog problem in the Los Angeles area. Los Angeles, however, continued to have one of the worst pollution problems in the nation despite the fact that it has also had one of the more aggressive local control programs. The Los Angeles Air Pollution Control District imposed a number of relatively successful stringent restrictions on stationary sources including backyard incinerators, in its attempts to reduce air pollution.[8] At one point, the Los Angeles District argued that its mandate was to completely eliminate air pollution. In justifying its activities, the Director said, "There is no basic right to use the air as a sewer."[9] Unfortunately, the District had no authority over the automobile, land use, or the region's transportation system. Moreover, there were other significant limitations to the State and local control efforts. Krier and Ursin in their study entitled, Pollution and Policy discuss these limitations and present a detailed description of the history of air pollution control in California.[10] They analyze the controversy surrounding the determination of the automobile as a primary source of pollution and also recount the worsening of the problem from the end of the Second World War to the 1970's. In their view, State and local activities to control air pollution in the 1940's and 1950's and 1960's were minimal and characterized by the taking of the fewest steps

(and those of least resistance) in response to the air quality crises that occurred. Relatively speaking, however, California was still in the vanguard of air quality control.

If State and local governments reacted hesitantly to the air pollution problem, early federal efforts were even more cautious. In 1912, the Bureau of Mines in the Department of the Interior, published 3 bulletins on the prevention of smoke from coal-burning equipment.[11] The Bureau's Office of Air Pollution conducted a limited number of studies through the years and was the principal location for such studies within the federal government.

In 1949, President Truman requested that a technical conference on air pollution be held. Over 750 people attended this conference in 1950. The federal government was urged to "help identify air pollution problems and develop the technology to combat them."[12]

In 1952 the House of Representatives passed a resolution providing for research into the causes and effects of air pollution and methods for its prevention and control. The Senate killed the legislation.

It should also be mentioned that in 1946 a major air pollution event occurred in Pennsylvania and in 1952 smog in London was widely blamed for the death of several thousand persons.

C. The Air Pollution Control Act of 1955

In his 1955 State of the Union message, President Eisenhower responded to the growing national concern over the

expansion of air pollution by promising programs to combat the problem. In a later special message on a health program, he indicated a need to "step up research on air pollution. As a result of industrial growth and urban development, the atmosphere over some population centers may be approaching the limit of its ability to absorb air pollutants with safety to health."[13] Certain State and local governments, especially in California, supported federal legislation. One argument advanced was that local taxpayers should not be burdened with paying for the necessary research on what was essentially a national problem.[14]

The bill, supported by the President, (P.L. 84-159) passed Congress with little disagreement and was signed by the President on July 14. A useful summary can be taken from the act itself. It declares that it is "the policy of Congress to preserve and protect the primary responsibilities and rights of the State and local governments in controlling air pollution, to support and aid technical research to devise and develop methods of abetting such pollution, and to provide federal technical services and financial aid to State and local government air pollution control agencies and other public and private agencies and institutions in the formulation and execution of their air pollution abatement research programs."[15] The law also provided for federal surveys of specific local problems upon request and for the publication of reports by the Surgeon General. Finally, it authorized

$5 million annually for five years to implement its provisions.

At that time the federal government perceived the problem as minimal and localized in nature. There was a great reluctance to play a major role and President Eisenhower opposed any federal enforcement authority.[16] There were, however, disagreements within the executive branch and some, like Arthur S. Flemming, the Secretary of the Department of Health, Education and Welfare (HEW, the agency responsible for the administration of the federal air quality program at that time) favored increased federal involvement. In part, the unwillingness of the Federal level to expand its influence stemmed from a strong reluctance on the part of many federal officials to threaten their existing relationships with State and local governments by moving into an area currently under their complete jurisdiction. The 1955 Act, then, retained the State and local responsibility for responding to air pollution problems and simply provided limited federal financial assistance, particularly in the area of research.

In 1959, the Bill was extended for four more years at the original funding level. There had been a growing concern about automobile emissions, however, especially as a result of the research carried out in California, and Congressman Paul Schenck, from Michigan, who wanted to prohibit the use in interstate commerce of cars discharging substances in amounts "dangerous to human health," was able to get a bill

passed in 1960 which required a "thorough study" of motor vehicle exhaust in two years.[17]

Also in 1960, California Senator Thomas Kuchel succeeded in convincing the Senate to report a bill which gave the Surgeon General power to hold hearings on interstate air pollution problems. Even though the bill did not include any federal enforcement power, the House took no action. The same scenario was repeated in 1961. Congress remained reluctant to expand the federal role.

A major change in the federal attitude occurred with the election of President Kennedy. In 1961 he indicated his support for a more substantial federal air pollution program. In a special message on natural resources, he said: "We need an effective federal air pollution control program now. For although the total supply of air is vast, the atmosphere over our growing metropolitan areas--where more than half the people live--has only limited capacity to dilute and disperse the contaminants now being increasingly discharged from homes, factories, vehicles, and many other sources."[18] The growing seriousness of the problem and its expansion to more areas had convinced the executive branch, at least, that a more active federal involvement was necessary.

In 1962, the administration asked the House to pass the bill previously approved by the Senate but the relevant House Subcommittee, chaired by Ken Roberts of Alabama, asked for more time and only approved a two-year extension of the 1955

Act. This extension was approved by the Senate and signed by the President on October 9, 1962, although the administration was disappointed.

D. The Clean Air Act of 1963

According to one observer, the Clean Air Act of 1963 "represented a compromise between those who desired a strong federal presence in the enforcement field and those who supported the doctrine of primary state and local responsibility."[19]

The pressures for a stronger federal presence increased during 1963. Not only did the administration and the Senate support an increased federal role, but they were joined by what was known as the urban lobby--the United States Conference of Mayors, the American Municipal Association and the National Association of Counties.[20] The leadership of these organizations saw the need for greater federal assistance in solving the air pollution problem on the local level, a problem which continued to grow in seriousness. Local governments had serious difficulties in trying to combat the problems on their own.[21] These problems included limited financial resources, the difficulty of local jurisdiction had cooperating with each other, the power of industry, and the total inability to control some of the major pollution sources, like the automobile. Local governments then, welcomed the expansion of federal involvement at this time and viewed it as a source of assistance rather than as a threat. What they hoped for was increased federal financial aid and the federal

clout in dealing with major polluters.

Opposed to the extension of federal activity beyond research were a number of industrial groups, like the National Association of Manufacturers.

While substantial conflict existed regarding the federal role in enforcement, there was general agreement on the other provisions in the Act. The Bill provided for more intensive research and new grants in aid to State and local pollution control agencies. $95 million was authorized over a three-year period.

The key shift in Congress that led to the approval of limited federal enforcement occurred when Congressman Roberts reversed his position. According to Ripley, after extensive hearings and discussions, "he became convinced that the problem was a truly national one and that it offered an immediate threat to the health of millions of Americans."[22] He came to believe that a limited amount of federal enforcement was both needed and feasible. On the other hand, he wished to avoid divisiveness and partisan warfare and agreed to severely limit the federal enforcement powers. The enforcement procedure finally adopted then, was extremely limited and, according to one critic, was long, complicated, cumbersome, and riddled with loopholes, mandatory delays, and misplaced burdens of proof.[23] It did, however, expand the federal influence to a major new area and establish the principle that federal enforcement was justified.

Federal involvement in enforcement actions was mandated by the Act in three specific, but limited, situations:

1. When the Governor or other designated local official requested federal intervention due to an interstate pollution problem;

2. When a State or local official requested federal assistance involving a solely intrastate pollution problem;

3. When the Secretary of HEW, after consultation with appropriate State officers, had reason to believe that interstate air pollution was endangering public health in the State receiving the pollution.[24]

The abatement proceedings established were modeled after the conference system established in the Federal Water Pollution Control Act. As described by Kramer, under this procedure HEW would call a conference of State and local air pollution control agencies when appropriate.[25] The alleged polluters could be invited and a 3-week notice was required. The conference was informal in nature and often focused on determining the source of pollution. After hearing the evidence, the conferees usually submitted recommendations. The Secretary of HEW was then required to prepare a summary of the conference with recommendations, if any, for abatement. The minimum time period for compliance with any recommendations was six months. If the Secretary was dissatisfied after this period, he could then call a public hearing. This required prior notice of three weeks. After the public hearing,

the hearing board would make findings and recommendations and submit them to the Secretary, who could then forward them to local agencies for implementation. Again, a minimum of six months was provided for implementation. Finally, if the Secretary was still dissatisfied after this waiting period, he could request the U.S. Attorney General to file suit to secure abatement in cases of interstate pollution. Where intrastate pollution was involved, a federal lawsuit could only be filed if the governor requested it.

It is not surprising that this cumbersome procedure, which was continued in the 1967 legislation, was not successful. Federal enforcement activity was minimal and where it did occur, it rarely succeeded, and, then, only after considerable delay.[26] Any serious State or local opposition to federal enforcement activity in a particular case could easily thwart it. On the other hand, even with full State and local cooperation, success was extremely difficult to achieve.

In summary, then, "the most salient aspect of the Clean Air Act of 1963 was that Congress recognized for the first time the national scope of the air pollution problem." While federal involvement was hampered and limited by the commitment to the primacy of local control and by the influence of industry, "once the precedent was set for increasing federal involvement, predicated on the State's inability to abate pollution, the inevitability of further federal controls became a reality."[27]

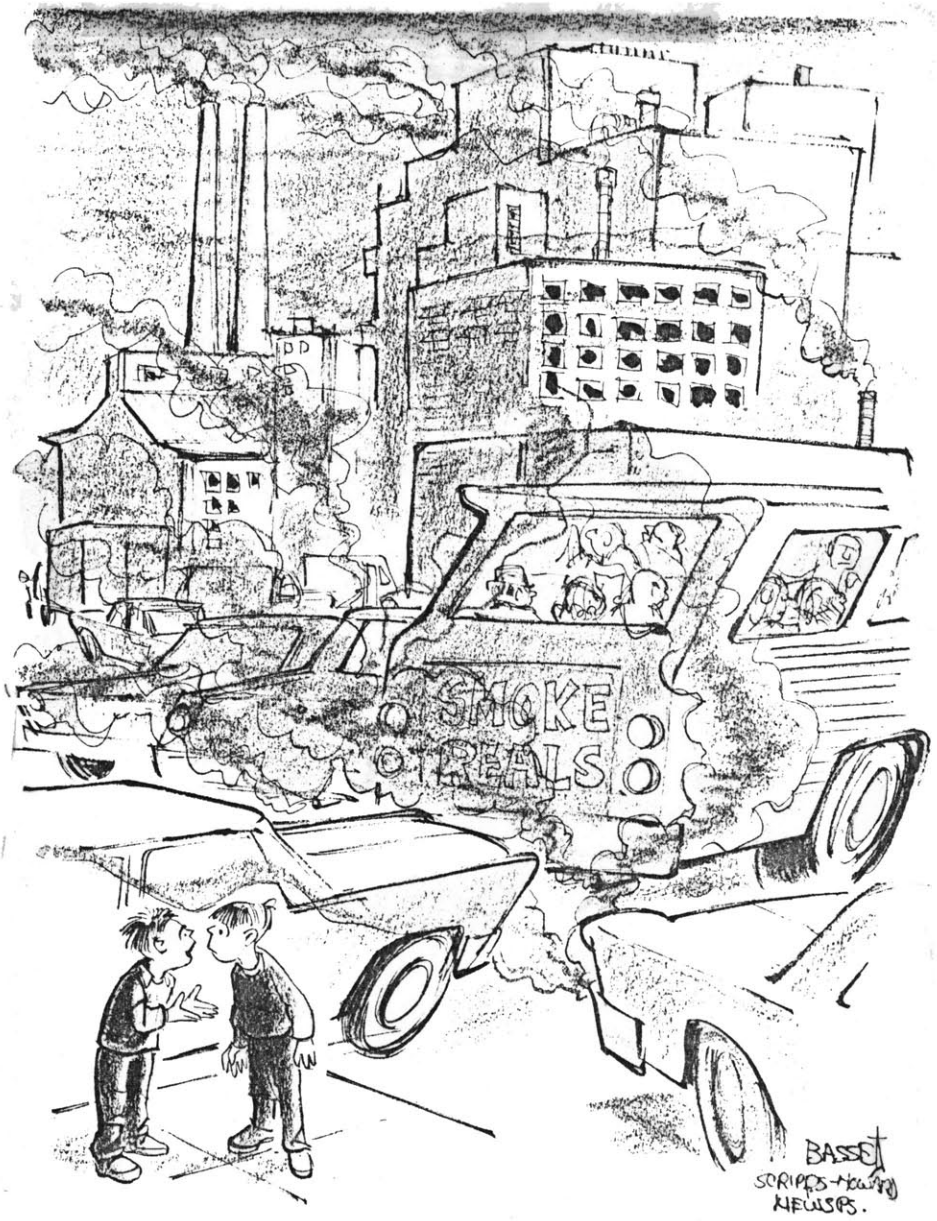
During this period of increasing federal activity, the states and localities were also becoming more active in the air pollution area. By 1963, 33 states and territories had enacted air pollution legislation. By and large, however, the legislation was weak and in response to the availability of federal funding. Most areas had not begun to make a dent in their problem.[28] On the other hand, the California program had become more aggressive. In 1960 the first law in the country to control automobile emissions was passed in California. Not only the State but local air pollution control districts as well began to strengthen their regulations. In many respects, the federal air quality effort during the 1960's was directly modeled on the California program.[29] In fact, part of the pressure to expand the federal influence was motivated by the desire on the part of industry to avoid different and, potentially, stricter regulations which were likely to ensue as state and local activity increased.

The Clean Air Act of 1963 itself did not consider automobile emissions at all. However, partially as a result of hearings held in California in 1964 at which then Governor Brown identified cars as the major problem, the Motor Vehicle Air Pollution Control Act of 1965 was approved by Congress as an amendment to the 1963 Act and authorized the Secretary of HEW to promulgate standards to control emissions from cars beginning with the 1968 models.[30] President Johnson initially opposed the legislation, preferring voluntary compliance, but,

with increased public pressure, finally approved it. The auto industry also supported the concept of federal standards because of their fear that 50 different standards might result if each state adopted its own. In fact, as a result of industry pressure, every state but California was prohibited from adopting standards stricter than the federal ones.

The auto industry even tried to pressure Congress to remove California's exemption from federal standards through the Dingell Amendment to the 1967 Clean Air Act. A tremendous public outcry, however, defeated this move. The successful opposition to the Dingell Amendment is a good example at least as far as one State is concerned, of the local ability to resist unwanted federal influence. The standards adopted by the federal government under the 1965 Act were the same as California had adopted in 1963.

In the early 1960's, then, federal participation in air pollution control activity increased cautiously but substantially. By and large, state and local governments, whose activities were also expanding, welcomed the federal involvement. The most concerned local governments saw the federal government as, primarily, a reluctant but necessary ally. Any fears of unwanted federal intrusion in the air quality area were based on the concern that industry might have too much sway at the federal level and, thereby, stimulate federal efforts to undercut pollution control activities.



'It's all right . . .breathing is okay as long as you don't inhale.'

Source: U.S. HEW, No Laughing Matter

E. The Clean Air Act of 1967

By 1967, the air pollution problem was expanding despite governmental efforts. The various programs initiated to improve air quality did not appear to be succeeding. The problem was more complex than anticipated, both technically and politically. It had also become more severe and there was a growing sentiment that it had become a legitimate national concern. These factors as well as the interstate implications of air pollution justified an expanded federal role. Despite the fact that governmental intervention had increased on all levels, there was increased criticism of both the limited federal program and the ineffectiveness of state and local efforts.

The 1967 Act sought to extend federal activity but still maintain the primacy of state and local control. The goal was to establish a mechanism whereby the federal government could be assured that state and local governments would take the necessary actions to solve the air pollution problem but, at the same time, would not have to intrude on their traditional prerogatives.

The central controversy surrounding the passage of the Act concerned the setting of ambient air quality standards; i.e., standards for a region's air quality. President Johnson wanted the federal government to play the dominant role in setting and enforcing uniform standards. Senator Muskie, the most powerful Congressman in the environmental area, favored

the states taking the initiative.[31]

While the debate was decided in favor of the states determining the standards, Congress did approve significant extensions of federal influence, at least potentially. The new federal activity was related to the setting of ambient air quality standards by the states. The federal government would first designate air pollution control regions. States would then be responsible for promulgating the standards for these regions. The standards would be based on federal technical reports. The states were also responsible for adopting control or abatement plans for achieving the standards. HEW would then review and approve or disapprove these plans.

HEW could establish ambient air quality standards if the states failed to act. This was a potentially important break with the past and represented a significant expansion of federal influence. Moreover, HEW could only approve state standards or plans if they met the following conditions:

1. State standards had to be consistent with the background criteria documents and reports on control techniques prepared by the federal government.
2. Plans had to be capable of leading to the attainment of the State standards.
3. Plans had to be enforceable by the states.

Since the federal government had the veto power over standards and plans, it was argued that it thereby became the

guarantor of effective regulations.[32]

While HEW could promulgate air quality standards if the states failed to act, the Act was unclear as to whether it could also promulgate the necessary control plans to attain the standards. The Act was also unclear regarding HEW's approval power over already existing standards. Finally, the additional responsibilities were not commensurate with HEW's enforcement powers. While the Act permitted direct federal enforcement if air quality in a region fell below prescribed standards and the state failed to take reasonable action to implement the standards, in fact, the conference system remained the major enforcement tool. These factors undercut the ability of the federal government to actually increase its influence over state and local governments.

As mentioned earlier, the conference system, for example, was not a successful tool. Between 1963 and 1970 only ten federal enforcement conferences were held. It took seven years to shut down one chicken rendering plant where everyone but the owner wanted it abated. The other enforcement actions were also, by and large, ineffective.[33]

While great hopes were placed in the 1967 Act by its proponents, at best its bark was worse than its bite. The biggest problem was that meaningful federal intervention only occurred after the states had acted to set standards and adopt plans and after regions had been designated. Since it took so long for these steps to occur, no meaningful action ever did take

place. By 1970, many regions had not yet been designated. While 21 state implementation plans had been submitted, none had been acted upon.[34] Moreover, since the HEW effort was shifted to designating regions and preparing criteria reports for standards, the emphasis that had been placed on the conference system enforcement activities under the 1963 Act was withdrawn.[35]

The track record, then, of the 1967 Act appeared to be extremely poor and generated a great deal of criticism. Some attributed its failure to its emphasis on what was called "creative federalism"--meaning the central role given State and local government. As stated by Esposito, "the new message was 'cooperation, partnership, consensus' all of the shibboleths that disguise inactivity and lack of leadership."[36] State and local governments were seen as being unable and, in some cases, unwilling to respond effectively to the problem, while the federal government was denied the requisite powers to insure the necessary actions. On the other hand, others attributed the slow progress to the short time since the Act's passage or the inability of the States to gear up for the necessary effort.

Despite the criticisms, it is possible to see in the 1967 Act the basic skeleton for air quality regulation which would be continued in the 1970 Amendments. The major changes came in the powers granted the various governmental levels.

The 1967 Act, then, while maintaining the primary role

for State and local government in controlling air pollution, threatened a major expansion of federal intervention if its requirements were not met. In fact, the actual federal influence was probably reduced while the Act was in effect because its activities became more diffused. State and local governments increased their control activities during this period, but the problem continued to worsen. Some welcomed increased federal activity, others began to fear it. In certain respects the 1967 Act shifted the emphasis in air quality control from the local to the State level in many areas of the country.[37] This was due, in part, to the provisions of the Act, which required significant State involvement, and, in part, to the fear of increased federal intervention.

F. The Clean Air Act Amendments of 1970

According to Krier and Ursin, prior to 1970 public policy aimed at combating air pollution was dominated by certain themes:

--Governmental intervention was limited to those changes easiest to accomplish and causing the slightest disruption;

--Those advocating increased governmental activity were responsible for proving that such activity was necessary and would be effective. The initial bias was to not act and increased intervention occurred in small grudging increments;

--Increased government intervention was a response to crises. Involvement was not stimulated by planning or the desire to prevent the problem from worsening. Rather, it

tended to be a response to particular events and was designed to cure the immediate problem while preserving the prevailing social patterns;

--The basis of public policy was a fixation on technological solutions imposed through quick, direct but crude regulations and intended to avoid social disruptions;

--Policy was developed through a process termed "exfoliation," or the gaining of knowledge from bad experiences. Trial and error was the major problem-solving tool. The failure of each small step taken produced valuable information which suggested the direction of the next steps;

--Public policy implementation suffered from governmental lag, the unwarranted delay in government's resolution of a social problem. Significant amounts of time elapsed between the recognition of the problem and any attempts by government to solve it.[38]

While Krier and Ursin identified these themes primarily in their examination of California's air pollution control program, they seem equally applicable to the federal effort over the same period, except that the federal effort was probably even less aggressive than California's. What these themes clearly indicate is that, despite increases in federal involvement and, in fact, in activity at all levels, the governmental response to the air pollution problem up to 1970 was characterized more by caution and hesitation than by a strong, aggressive action.

By 1970, however, the environmental movement had become national in its scope. Public pressure on government to solve environmental problems, like air quality, had grown considerably. The nation's air quality had continued to deteriorate after what seemed like years of governmental concern. The 1967 Act was increasingly criticized as ineffective.[39] In 1970, Vanishing Air by John Esposito of the Nader Study Group was published. The book contained a blistering attack on the 1967 Act, federal activity in the air quality area in general, and Senator Muskie in particular. Muskie was the most closely associated with the 1967 legislation and was considered to be a strong environmentalist.

At the same time, President Nixon decided to take the initiative in environmental matters and introduced stronger Clean Air legislation. Senator Muskie at first tried to defend the 1967 Act, but then went on the offensive and reported out a much stronger bill than even President Nixon had anticipated. The 1970 Amendments provided for a significant extension of federal power, in some ways unprecedented, and the President only signed it reluctantly.[40]

There were a number of important reasons behind the enactment of the 1970 Amendments. First was the frustration over the ineffectiveness of the 1967 Act. This ineffectiveness was blamed on the limited federal role and the failure of State and local governments to solve the problem. Congress had grown frustrated with State and local governments and felt



'You'll be all right in a few days. Just stay indoors, keep the windows closed, and stop reading the New York Times Air Pollution Index.'

Source: U.S. HEW, No Laughing Matter

they were unable to carry out their responsibility to clean the nation's air.[41] The 1970 Act strengthened the federal role and significantly reduced State and local powers, although lip service was still paid to local control. Second, the evidence of the public health hazards of air pollution had grown and it was generally agreed that bad air was a subject for serious national concern and required a decisive program to deal with it.[42] Third, through recent experience it was realized that air pollution was an extremely complex problem requiring a variety of techniques to bring it under control. Finally, what was called the "multiple crack" aspect of federalism played a part. Under this principle, groups carry their concerns to another governmental level if they fail at one level. Up until the late 1960's, industrial groups had great influence at the State and local levels and therefore, resisted federal intervention. By 1970, as states and localities became more active, national corporations came to prefer uniform federal regulations, even if they were more stringent.[43] In this regard, the automakers, for example, understood that the federal standards would still permit them to operate as they had in the past and would not require them to develop a fundamentally new technology. Citizen groups, in frustration with lower levels of government, also increased their pressure on the federal government. In sum, then, Congress decided, and other powerful interests concurred, that the problem was of sufficient national concern to require a



'What ! Add a $10 gadget like that ?'

Source: U.S. HEW, No Laughing Matter

strong federal solution and, therefore, established a system to ensure the achievement of that solution.

1. Provisions of the 1970 Clean Air Act Amendments

While the purposes of the 1970 Amendments included the statement that air quality control was primarily the responsibility of State and local governments, in fact, the basic thrust of the 1970 Amendments was for the federal government to identify the major air pollutants and establish ambient air quality standards applicable on a nationwide basis which would be attained within strict time deadlines.[44] The standards were to be set within three months of the enactment of the Amendments and the states would then have nine months to adopt a State Implementation Plan (SIP) which would provide for the achievement of these standards in each air basin within from three to five years.[45] The Act also specified the major elements to be included in each SIP and provided that the federal government had to approve each state's plan within four months of submission.[46] If a state plan did not meet the requirements of the Amendments and was, therefore, not acceptable, the federal government was responsible for promulgating an acceptable plan within six months.[47] Among the requirements for the state plans was the establishment of an air quality monitoring program, the adoption of performance standards for new stationary sources and the inclusion of transportation control and land use measures as necessary.[48] To be acceptable, the Plan had to "show" that it could meet the federal standards within the required time period. Thus did

the Act attempt to maintain state and local primacy. The federal government was responsible for setting the standards and the States were responsible for adopting and implementing the plans to achieve them, with close federal oversight to insure that this occurred.

The Amendments also contained provisions for direct federal enforcement in specific air pollution cases where emission standards were being violated by a polluter and for federal enforcement of State plans where widespread violations were occurring.[49] Citizen suits were also permitted in order to insure that the Amendment's provisions were implemented. This proved an important factor in the Amendments' history.[50] Finally, the Act required a 90 percent reduction in tailpipe emissions from 1970 motor vehicles within five years for hydrocarbons and carbon monoxide and six years for nitrogen oxide.[51] This was on top of the 75 percent reductions already achieved over pre-controlled vehicles.[52]

The Amendments, then, essentially promised clean air by 1975 and virtually guaranteed it by 1978.[53] The federal role had changed from one of minimal involvement to one of aggressive leadership in fifteen years.[54] By committing itself to solve the air pollution problems of the nation within a few years, the federal government justified the far-reaching expansion of its influence over State and local governments. Since the air pollution problem had continued to worsen while State and local governments had had the primary responsibility

for its solution, they were in an extremely weak position to oppose this expansion. In the eyes of the nation and the Congress, they had shown themselves incapable of meeting the challenge.

The seriousness of the problem and the need for a variety of activities to solve it also justified federal involvement in a number of new areas. Land use was one of these. It seemed likely to Congress that technological solutions, by themselves, would not be sufficient. Transportation and, even land use measures, might well be required. The role of these under the 1970 Amendments will now be considered.

2. Land Use and Transportation Control Measures.

With the 1970 Amendments, the first explicit attempt by the federal government to influence local land use planning decisions can be identified. As a minimum, the Amendments indicated a potential role for land use measures in achieving air quality standards. Federal involvement in the local land use planning area expanded as the Amendments were interpreted and implemented.

In a sense, the influence of the federal air quality program on local land use planning decisions can be traced to the primary requirement of the 1970 Amendments; i.e., that the federal air quality standards be achieved by all means available. However, the specific requirements of the Amendments and their interpretations related to land use activities were more significant.

a. Land Use Controls in State Implementation Plans

Section 110 (a) of the 1970 Act requires State implementation plans (SIPs) to include:

> emission limitations, schedules, and timetables for compliance with such limitations, and such other measures as may be necessary to insure attainment and maintenance of such primary or secondary standard, including, but not limited to, land use and transportation controls. (emphasis added)

The requirement for the inclusion of land use controls in SIPs where necessary is a relatively minor addition to a long list of programs which must be included. However, when viewed in the light of the authority granted to the federal government to promulgate an SIP, if States refuse or are unable to do so, this requirement represents a major potential expansion of federal influence into an area traditionally under the control of local government. Taken to the extreme, this provision would allow the federal government to promulgate a local zoning ordinance.[55]

While Congress may not have anticipated this broad expansion of federal jurisdiction, there had been a conscious concern with local land use decisionmaking. Senator Muskie, for example, stated that "implicit in the concept of State implementation plans" is the requirement that "urban areas do something about . . . the modification and change of housing patterns, employment patterns and transportation patterns generally."[56]

The actual effect of this provision on SIPs depended on the implementation adopted by the U.S. Environmental Protection Agency (EPA). The EPA was established in 1970 by the President and given the responsibility, among others, for implementing the Clean Air Act. Given the vagueness of the language in Section 110(a)(2), land use controls could be seen as essential elements of the SIPs by EPA or as supplemental control measures, included at the discretion of the states. In fact, initially EPA placed little emphasis on direct land use controls in the state plans and almost none of the early SIPs included any such measures. Those that did were minor in nature.[57] The initial SIPs only included control strategies for stationary sources. In general, EPA played a much more active role in the area of transportation controls than in land use controls. As will be discussed later, EPA's attempts to have transportation measures included in state plans, by itself generated significant controversy. In Mandelker and Rothschild's view, EPA's failure to require or encourage the consideration of comprehensive land use regulation made it extremely unlikely that the states would do so and, indeed, undermined the ability of the SIPs to achieve the Act's objectives.[58]

Despite EPA's reluctance to aggressively implement the section of the 1970 Amendments requiring, in certain circumstances, land use controls, a number of events took place which pushed EPA more and more into the area of land use control and planning.

b. Non-degradation.

The introductory language to the 1970 Amendments states: "The purposes of this subchapter are to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population." (emphasis added)[59]

This language was used by the federal courts in 1972 to uphold a Sierra Club suit to prohibit the EPA Administrator from approving any state plan which did not include provisions to protect the quality of the air in those areas where the air was better than the federal standards. According to King, "The theory of the action was that the Administrator (of EPA) was failing to perform a non-discretionary duty by his failure to require that state implementation plans assure no significant deterioration of clean areas."[60]

This decision had potentially far-reaching consequences, since it theoretically could prevent any significant industrial or population growth in clean air areas. Certainly, the requirement that each SIP include provisions to avoid the degradation of clean air areas was a significant extension of federal power under the Act. The decision obviously had significant land use implications. EPA's response to the Court decision was to promulgate regulations differentiating types of clean air areas and regulating the amount of deterioration permitted in each. EPA sought, as far as possible, to minimize the restrictions on growth. The controversy over non-degradation

however, was not resolved until the passage of the 1977 Amendments. Environmentalists accused EPA of continuing to ignore the mandate of the 1970 Amendments and state and local governments vocally opposed the federal intrusion into clean air areas and, potentially, land use planning decisions.

c. Indirect Source Review.

Indirect sources, or complex sources, refer to uses, like major highways and airports, large regional shopping centers, etc., which "contribute indirectly to air pollution by generating large amounts of motor vehicle traffic emitting vehicle related pollutants."[61] As with non-degradation, EPA became involved in indirect source review as a result of a successful citizen suit.

The EPA involvement developed in the following manner.[62] In May, 1972, EPA acted on a number of State Implementation Plans. In many cases, it approved plans and gave states additional time to prepare transportation control measures. Shortly thereafter, the National Resources Defense Council (NRDC) and Friends of the Earth sued EPA for failing to require the inclusion of transportation controls in the state plans and because the state plans were inadequate to insure the maintenance of federal standards as required by the 1970 Act. The Court upheld the plaintiffs and declared that the state plans must insure the maintenance of the air quality standards after 1975.

EPA immediately found that none of the state plans provided for the maintenance of standards after 1975 and that

the proposed control measures would not satisfy the court requirement, even if they were all implemented. The objective of SIPs up to that point had been simply to achieve the federal standards and those actions necessary to maintain the standards had not been considered. In fact, few SIPs had accomplished even this attainment.

EPA then responded to the court decision in a number of ways. Perhaps the most controversial was the promulgation of regulations for the control of indirect sources. In order to assure that federal standards would be achieved and maintained, the states were required to aggressively expand their control activities. As stated in the early indirect source review regulations, it was, therefore, "necessary to require states to review, and where necessary, prevent the construction of facilities which may result in increased emissions from motor vehicle activity or emissions from stationary sources that could cause or contribute to violations of national ambient air quality standards."[63]

In June 1973, EPA required the states to carry out this review as part of their SIPs. However, by October only seven states had submitted the required review procedures and only three satisfied EPA's requirement. Also in October, EPA issued final regulations requiring preconstruction review of a broad range of indirect sources. While EPA recommended that such reviews be carried out at the local level, the Administrator warned that EPA was prepared to enforce the regulations

itself if the states failed to do so. The federal government was threatening to involve itself directly in the approval process for local development projects, and those with major economic consequences. As a minimum, it was requiring the states to compel the localities to modify their existing practices. By February of 1974, a total of 14 states had submitted their review procedures and only two had been approved.

The EPA indirect source review regulations, especially those sections dealing with shopping centers and parking structures, generated a tremendous storm of controversy. Local governments, particularly, vigorously opposed this federal intrusion into their domain. Major developers also actively resisted the federal regulations. EPA was accused of coming into cities and prescribing the manner in which residents were to travel, where they were to park, how much to pay for parking and the amount of street improvements they were to receive. Further, it was alleged, the 1973 EPA regulations gave "virtual dictatorial power to regulate future land development within the city" to whomever was empowered to implement them.[64] In response to the nationwide uproar, Congress delayed the implementation of the regulations a number of times. In response to the Congressional actions, EPA indefinitely suspended their implementation in July 1975.[65]

The reaction to the indirect source review regulations is an example of the power of a united local government effort to resist the unwanted expansion of federal influence.

Localities were unanimous in their opposition to the regulations and were joined by powerful business interests. Congress, which had anticipated the need for aggressive land use controls in order to achieve the objectives of the 1970 Amendments, was nevertheless unable to withstand the pressure.

d. Air Quality Maintenance Program (AQMP)

Following the court decision in the NRDC case, the EPA initiated a second program to insure the maintenance of air quality standards. The June 1973 regulations required the states to designate air quality maintenance areas (AQMAs). These were areas which, as a result of current air quality and/or the projected growth rate, had the potential for exceeding any national standard within the subsequent 10-year period. Later regulations required a detailed analysis of the projected air quality in each AQMA and the development of an AQMA plan to be approved by EPA as part of the SIP which would assure that the air quality standards, once attained, would be maintained.[66]

The regulations required the inclusion of growth projections in the AQMA plan's preparation and, in fact, recommended one of the approaches described previously herein for incorporating the air quality-land use relationship into the planning process. In particular, states were referred to the Voorhees, et al., Guidelines for Air Quality Maintenance Planning and Analysis - Volume 4: Land Use and Transportation Considerations for guidance in relating air quality

maintenance to comprehensive planning. The regulations even specifically anticipated the possible inclusion of local zoning ordinances containing emission density limitations in the AQMA plans.

The regulations, however, did not require the inclusion either of specific land use measures in the AQMA plans or of the air quality-land use relationship in the local planning process. On the other hand, they did state the following: "the Administration intends to encourage State and local governments to incorporate air quality considerations into plans for growth and development so that air quality standards will be maintained."[67] The regulations further recommended that any changes in local land use plans be reflected in the AQMA plan.

These regulations clearly indicate the federal desire to influence local land use planning decisions and their conviction that land use controls were a basic component of an air quality control strategy. However, strict federal requirements were minimal. Localities were to assess the problem and propose solutions. The regulations emphasized the need for intergovernmental cooperation. They also did not require a specific date for the submittal of AQMA plans. This was to be worked out on a case by case basis by the EPA Administrator.

In fact, few if any AQMA plans were adopted prior to the passage of the 1977 Amendments and the AQMP generated minimal local opposition.

3. Evaluation of the 1970 Amendments

The 1970 Amendments constituted a major expansion of federal influence on the local level in the area of air quality control. While the air pollution control activities of all levels of government increased under the Amendments' provision, the expansion of federal involvement in new areas of concern generated significant controversy. This was particularly true in the case of land use and transportation measures. The experience under the 1970 Amendments also revealed the basic complexity of the air quality problem.

a. State and Local Concerns

Krier and Ursin probably expressed the view of many state and local governments when they stated that after 1970 cooperative federalism became distinctly uncooperative--under the 1970 Amendments pollution policy became national and the states were "little more than reluctant minions mandated to do the dirty work--implement federal directives often distasteful at the local level."[68] According to Krier and Ursin, "Congress reduced the realm of ultimate State and local authority to relative insignificance."[69] It might be added that at the same time the States and local governments were asked in some cases to do the impossible.

Much of the criticism was a reaction to the federal intrusion into areas of traditional local control. Local governments complained loudest about the federal takeover of their prerogatives when the federal activity most closely

interfered with their ability to make land use and transportation related decisions.

State and local criticism of the 1970 Amendments in many cases also resulted, specifically, from federal attempts to promulgate and implement state implementation plans when the state plans were deemed unacceptable by EPA.

Many state plans were found inadequate because they clearly would not meet the air quality standards in the Amendments within the required time period. In EPA's view the only way these standards could be met was by the inclusion of transportation control measures. However, as Chernow argues, the states did not have the political muscle to implement these measures. In fact, in most cases the SIPs simply summarized existing activities and hoped that in conjunction with the federal automobile emission standards, the ambient air quality standards would be achieved.[70] In addition, in the case of Los Angeles, it was realistically impossible for anyone to meet the federal standards within the deadlines, even with transportation controls. Automobile trips would have had to be reduced by 80 percent.

The 1970 Amendments, however, required EPA to prepare an adequate SIP and implement the measures necessary to meet the standards, if the states did not. Moreover, if EPA balked, someone was usually ready to take them to court to compel compliance. Riverside County, for example, forced EPA to attempt to promulgate a plan for the Los Angeles area which, of necessity, called for strict gas rationing and other draconian

measures.

As a result of the Act's mandates and court pressure, EPA attempted to adopt and enforce SIPs in many of the country's largest cities. It is not surprising that dozens of these cities sued. They were often successful.[71]

Several of the cases raised basic constitutional questions. The states argued that constitutional guarantees of the separation of powers were being violated. EPA could not legally require a State to operate a control program. If EPA wanted to impose it, the federal government had to run it. Further, EPA had no constitutional right to regulate land use. While these cases were appealed to the Supreme Court, the issues were not resolved because EPA backed down and suspended the challenged requirements before a decision was reached.[72] EPA also backed down or lost most of the local government suits, as well. In all, 196 suits were filed in opposition to the EPA plans.

Another objection to EPA attempts to enforce state plans was not legal but practical. In reality, the federal government did not have the manpower to carry out adequate enforcement activities, even if the courts let them. Realistically, it was argued, state and local governments were needed to enforce the requirements of the Amendments and, therefore, could not be ignored in determining the necessary control measures.

b. Transportation Control Measures

Many of the local criticisms of the 1970 Amendments resulted from the EPA's determination that strong transportation control measures were necessary to fulfill the requirements of the Act. These measures required substantial changes in people's behavior and, in some cases, local development decisions. Local government became the focal point of the opposition to them. In a sense this was predictable since one of the reasons the 1970 Amendments provided for strong federal intervention was that local and state governments had shown themselves incapable of carrying out the actions necessary to substantially improve air quality; in part due to their reluctance to take strong actions. To a certain extent, then, local government was probably used by powerful interests to spearhead and lend legitimacy to their own opposition to the federal requirements.

It is also true, however, that at times, the local governments accurately expressed the concerns of the large majority of their constituencies in resisting some of the transportation control measures proposed by EPA. Strict controls never developed a large public constituency.

Some of the criticism of the federal efforts in this area stemmed from concern over the effectiveness of the transportation control measures themselves. While EPA acted as if they were determinative in attaining federal standards, others argued that they would only have a minor impact on air quality

at best.[73] In fact, some of the suits against EPA's enforcement program succeeded because EPA could not document the effectiveness of its own measures.

c. Singlemindedness

Another aspect of the local government criticism of the 1970 Amendments concerned their singlemindedness. Local government, it was argued, attempts to deal with problems in a comprehensive manner. Concern with air quality should be integrated with other land use and transportation goals. All other local objectives should not be sacrificed in order to achieve air quality objectives.[74]

Part of the criticism of the Amendments' singlemindedness centered on the absence of concern for the social and economic costs of attaining its objectives. While Congress appeared to have placed the nation's public health above the cost of achieving it, some observers felt that the federal demands were unfair. The federal government usually pays for the programs it requires. In this case, however, the private sector was expected to shoulder the costs of cleaning up the air by itself.[75] Demands were made for federal subsidies or the relaxation of requirements. This complaint extended beyond the industrial polluters and auto makers. EPA was also criticized by local governments for attempting to implement transportation control measures without concern for their potential impact on jobs.[76] On the other hand, the cost-benefit ratio of the federal air quality program was never

clearly established. EPA estimated that the costs and benefits would even out. The findings of private studies differed.[77]

To some extent, these concerns with the singlemindedness and costs of the federal program can be seen as part of a local strategy to resist the growing federal influence. This does not mean, however, that they were without merit. In a sense, they illustrate the complexity of solving the air pollution problem. To succeed, the costs of the federal program were likely to be great and, to some degree at least, unanticipated. In addition, other important objectives might need to be sacrificed in order for clean air to be realized. It was never clear, however, just how far the federal government would have to go in order to clean up the nation's air.

A final word about costs. Local governments looked to the federal government for additional funds to carry out the provisions of the Amendments.[78] In part this indicated a willingness to expand the local effort with the necessary federal financial assistance. At times, though, it appeared that the local requests derived more from a desire to embarrass the federal government by arguing that huge sums of money would be required.

d. Deadlines

Another substantial criticism of the 1970 Amendments concerned their mandated implementation schedules. Probably as an antidote to the problems under the 1967 Act, Congress

imposed strict and rigid deadlines in the 1970 Amendments. These inflexible deadlines at times put EPA in the position of trying to do the impossible, as occurred with the proposed plan for Los Angeles. They also made it extremely difficult for EPA to negotiate with the States, let alone localities, over the contents or implementation of the SIPs. Congress had hoped that the threat of federal promulgation and enforcement of State plans would provide the incentive for the States to develop their own adequate plans. However, as the requirements increased and the political difficulty of adopting an acceptable plan grew, there was no time for EPA to work out solutions with the States. EPA was compelled to take action and, since in many cases it was drastic, vigorous opposition developed. In fact, a study sponsored by the National Science Foundation concluded that, while the goals of the 1970 Act were reasonable, the time frame was not.[79]

In one sense, the deadlines led to a rapid expansion of federal influence as states and localities would not or could not meet them and EPA was, therefore, required to intervene directly. On the other hand, the deadlines probably seriously undercut the federal effectiveness by placing EPA in impossible positions and making it, at times, an easy target. This probably explains, at least in part, EPA's reluctance to enforce some of the deadlines in a strict manner. In a number of instances, court cases were utilized to force full federal compliance. EPA, then, was often caught between state

and local governments on one side and environmentalists on the other. Both were displeased with its implementation of the Amendments' time requirements.

The experience with the deadlines of the 1970 Amendments is also an example of the complex nature of the air pollution problem. While the problem is serious and the federal government wanted a relatively quick solution, the pieces would not fall easily into place. The deadlines, usually, were not met. Whether the causes were political or technical, clean air could not be compelled simply by the establishment of federal deadlines. On the other hand, the lack of strict deadlines would have resulted in other criticisms. The 1967 Act was evidence of that.

e. Standards

The 1970 Amendments were also criticized because of the strictness of their standards. The standards were based largely on worst-case assumptions. Critics questioned whether the effects on public health of air pollutants should continue to represent the sole criterion for standard setting.[80] It was argued that the costs of achieving the standards should also be considered. This concern was raised mainly by industry.

A related criticism concerned the state of knowledge regarding the health hazards caused by air pollution. The air quality standards were based on a very limited number of studies and, in fact, there still is not a great deal of solid



Source: U.S. HEW, No Laughing Matter.

evidence on which to base the particular standards selected.[81] On the other hand, public health professionals argued that the non-attainment of the standards would have serious adverse public health consequences.[82]

A final criticism of the standards concerns their uniformity. According to Krier and Ursin, the uniform federal standards for air quality represented a central shortcoming in federal pollution policy.[83] As a result of the fact that the same standards applied nationwide, only socially and politically unacceptable measures, in some cases, could lead to their attainment. Los Angeles is a good example of this problem. In the same vein, the federalization of air quality control meant the loss of sensitivity to local variations as the federal straitjacket was inflexibly imposed on every area. There is a general tendency for the "lowest common denominator" to prevail when uniform standards are applied, although, in this case, it might be characterized as the highest common denominator. To a large extent, this criticism of the standards is in reality another criticism of the deadlines. The issue isn't so much whether the standards are desirable nationwide, but whether it is either fair or realistic to expect every locality to achieve them within the time constraints.

One of the unavoidable consequences of the expansion of federal influence generally appears to be that the adoption of uniform standards may result in hardships in certain local areas. On the other hand, the danger with locally determined

standards is that they may be set so as not to disturb powerful local interests and, thereby, will not lead to improved conditions.

The debate surrounding the federal standards once again points out some of the complexities in resolving the air pollution problem. Not only is the basic factual data limited but each of the policy alternatives entails serious difficulties.

f. EPA's Role

EPA was also criticized not only for being too active in the implementation of the 1970 Amendments, but for not being active enough. Environmentalists contended that the EPA, under President Nixon, did not seriously attempt to implement the Amendments effectively. It was argued that the 1971 implementation guidelines promulgated by EPA were, in significant ways, a response to political pressures and a retreat from the intentions of the 1970 Amendments. Later, after citizen suits compelled federal action, EPA took positions that were doomed to generate substantial opposition and, ultimately, to fail.[84]

Whether EPA's initial attempt to avoid conflict was due to an unwillingness to step on the toes of powerful interests or to an understanding of the resistance that an aggressive program would incur is debatable. It is also difficult to determine whether, after the court cases on the non-degradation and maintenance issues, EPA was motivated by a desire to achieve the objectives of the Amendments within the legal time

limits as aggressively as possible or by the wish to point out the impossibility of achieving them and, thereby, compel congressional action.

g. Automobile Emissions

The automobile emission standards played an important role in the ability of state plans to meet the federal ambient air quality standards and in the responses to the 1970 Amendments. Since in almost all air basins, automobiles were the major cause of air pollution, a 90 percent reduction in 1970 model emissions, as required by the 1970 Act, would almost by itself guarantee a successful SIP. In fact, only in the regions with the worst air quality were additional transportation control measures likely to be required. The automobile manufacturers, however, strongly argued that the standards were unrealistic and could not be met by the deadline. By 1974, it became clear that the standards would not be met in time. Also, the energy crisis was in full swing and environmental concerns were less of a public issue. In the Energy Supply and Coordination Act of 1974, Congress postponed the automobile emission standards until 1977.[85] On the other hand, it was felt that gasoline conservation could benefit air quality if automobile travel was reduced.

In response to the postponement of the automobile standards, however, states and localities accused the federal government of unfairness, since they were still expected to meet the deadlines for achieving the national ambient

standards. Reaction to the relaxation of the timetable for achieving automobile standards became a part of the local strategy to resist the federal program. It probably also lent increased fervor to the local efforts. If the federal government would respond to the needs of the auto industry, surely the problems of the local areas in meeting the federal requirements would be heard. The pressure on the federal government to loosen up on its controls over state and local governments was thus increased.

h. Accomplishments

What, then, were the results of the 1970 Act? Did the country's air quality improve? Were the ambient air quality standards met?

The Council on Environmental Quality in its 1977 Annual Report argued that for the five major pollutants present in the air, the nation's air quality had improved.[86] Presenting statistics for a number of major cities, the report stated that, while nearly all major cities are still in violation of the federal standards, with aggressive control programs the standards could be met.

Others were less sanguine. The testimony at the 1975 hearings on the Implementation of the Clean Air Act was much more ambivalent. Despite monitoring data indicating a decrease in individual pollutants in some areas, it appeared questionable whether real improvements had been achieved.[87] There is little disagreement, however, that the 1975 deadline for attaining the national ambient standards was met by very few

localities.[88] The Amendments appear to have been much more successful in imposing emission standards on individual industrial polluters.

While the 1970 Amendments sparked tremendous intergovernmental controversy, even some of their sternest critics applauded them for successfully raising the level of knowledge, of the public and of political leaders, regarding the air pollution problem.[89] The potential impacts of land use and transportation controls on air quality, for example, became widely recognized even if specific implementation plans were resisted.

i. Evaluation of the 1970 Amendments--Conclusion

The 1970 Clean Air Act Amendments, then, propelled the federal government into the forefront of the national effort to eliminate air pollution. Clean air became a primary national goal and considerable federal priority was placed on its achievement. The 1970 Amendments sought to achieve clean air by requiring the private sector, and state and local governments, to achieve it. This approach employed the regulatory stick primarily, rather than the financial carrot. In this, it was unlike most federal initiatives.

In their requirements and implementation, the 1970 Amendments placed, for the first time, the primary responsibility for achieving air quality on the federal government. Initially, state and local governments supported this change and looked forward to increased federal financial assistance

and a reduction in the criticism which had been leveled against them for not solving the problem. The responsibility for solving the air pollution problem had become an extremely heavy burden as conditions worsened and public criticism mounted. State and local governments didn't anticipate, however, the expansion of federal influence into areas, such as land use and transportation, from which it had traditionally been excluded.

On its side, the federal administration initially sought to expand its influence cautiously. In certain areas, traditionally under local control, it was reluctant to enter at all. However, the Congressional intent as interpreted by the federal courts forced a more aggressive federal posture. The initial reluctance may have been due in part to the realization that the Amendments would lead to many conflicts and it was better to engage them one at a time than to have widespread resistance spring up at once. The political orientation of the administration undoubtedly played a part as well.

The federal courts played a dual role as far as the implementation of the 1970 Amendments was concerned. On the one hand, in the major cases brought by environmental groups, the courts caused a significant expansion of federal influence on local affairs. On the other hand, in cases brought by the states and local governments, the courts, by and large, applied a brake to the spread of federal authority.

In the end, the 1970 Amendments greatly expanded government activity in the air quality area at all levels. Although the federal government occupied the central position, the Amendments caused both state and local governments to expend significant time, energy, and resources on the air pollution problem.

The complexity of the problem played a major role in frustrating the attempts to solve it. A great deal has yet to be learned about the causes of air pollution, its effects on human health in various concentrations, and the strategies for controlling it. More important, probably, than the limitations of the existing information is the potential social disruption which would result if an immediate solution were forced. Complex political choices had to be made in order to assure that achievement of air quality standards would not cause disproportionate social or economic inconvenience.

Finally, in terms of land use, the 1970 Amendments recognized the possible significance of the air quality-land use relationship and included the potential for substantial federal involvement. The attempt to expand federal influence over certain local land use decisions led to stiff opposition and was defeated. The federal effort then focused on the planning process as the primary mechanism for integrating air quality and land use concerns; but the process was only established for a relatively short time and did not result in a significant effect.

G. The Clean Air Act Amendments of 1977

Prior to the passage of the 1977 Amendments, attempts were made to weaken the 1970 Amendments. However, Senator Muskie's strong position prevented drastic modifications.[90]

The 1977 Amendments, when finally adopted, responded to many of the issues and criticisms raised by the implementation of the 1970 Amendments. While the attempt was made to sell the 1977 Amendments which were enacted as a more realistic commitment to clean air, in fact, the 1970 Amendments were seriously weakened. Senator Muskie argued that the 1970 Amendments were watered down, not because there wasn't a connection between urban sprawl and shopping centers and dirty air, but because there was no political support to do anything about it.

The Amendments gave significant control back to state and local governments in the hopes that they would build the necessary political support, if they agreed that there was a connection.[91] The federal government retained overall responsibility for achieving clean air but substantial limits were placed on its authority. While EPA was still permitted to promulgate an SIP if the state's plan was unacceptable, severe limitations were put on what EPA could require. Parking surcharges, for example, and indirect source review could no longer be imposed.[92] In fact, EPA could not require that indirect source review be included in an SIP in order for it to be acceptable, except for federal facilities. States, however, could include it if they wished.[93] The language

referring directly to land use measures was deleted from the Act, though states were not prevented from including them in their SIP.[94] While transportation control measures are listed in the Amendments and must be considered in the state plans, particularly if an extension for meeting the standards is requested, EPA appears to be given significant leeway to permit exceptions.[95]

The 1977 Amendments also postponed the deadline for meeting the federal ambient air quality standards. New state plans had to be approved by July 1979 and to provide for meeting the standards by December 1982. If this was impossible and the state agreed to carry out reasonably available transportation control measures, the deadline could be extended until December 1987.[96] The major justification for this change in the deadlines was that the automobile emission standards were also delayed.

The Amendments required that a specific non-attainment plan be produced for each region in violation of the federal ambient air quality standards. These plans continued the AQMA planning process and incorporated it into the legislation under a different name. While these plans are required to include specific measures leading to the achievement of the air quality standards before the deadlines in the Amendments, it is questionable whether this will actually occur. The emphasis is placed on general purpose local governments to balance the necessary control strategies for attaining the

standards. Local governments under the Act must approve the agency drawing up the non-attainment plan, must agree to the plan, and must also agree to implement it.[97] Given the short time frame to produce the plan and the continued unwillingness of local governments to propose programs which would inconvenience their constituents, it may not be possible to produce acceptable or effective plans in areas requiring them. In a sense, the 1977 Amendments retain the air quality goals of the 1970 Amendments but establish a process which makes them even more difficult to achieve. The hope was that with more time and greater authority, state and local governments would take the necessary actions. It is still too soon to tell if this will, in fact, happen, though the case study discussed subsequently would not engender optimism.

In terms of land use issues, the 1977 Amendments required non-attainment plans to include growth projections. The intention was to use these projections as a means of affecting land use decisions and, ultimately, air quality. Rather than attempting to influence local land use planning decisions directly, the objective was to require localities to commit themselves to specific growth levels which would assure the attainment and maintenance of air quality standards. Federal financial grants for infrastructure improvements would then only be available for projects which would not support a growth level higher than the one projected. It was hoped that, as a minimum, the commitment to the growth projections

would stimulate local governments to amend their local land use plans to insure consistency. Unfortunately, a number of factors could undermine this strategy. First of all, since plans cover a long period, localities could agree to relatively low growth projections in order to assure in their plan that the standards would be met and then do nothing to regulate the area's growth or land use to prevent the projections from being exceeded. This is especially likely where the existing infrastructure can serve populations in excess of the projected levels and additional federal assistance is not needed.

The complexity of the air pollution problem can also serve to undercut the utility of the growth projections. Since air pollution is caused by a great many sources and a large number of control strategies can be offered for reducing it, the non-attainment plan can, through a combination of other measures, propose to achieve the standards without the necessity to restrict growth or to include land use measures. The 1977 Amendments permit state and local governments to strike their own balance among stationary source, automobile emission, transportation and growth management control strategies, as long as the standards are met, providing an invitation for local bodies to focus entirely on technological measures as a way of avoiding land use related considerations. This will also be seen as occurring in the case study described later. The non-attainment plans, then, rely on growth projections as

as the primary mechanism for incorporating the air quality-land use relationship in the non-attainment planning process but do not assure that the consideration will be meaningful. However, the inclusion of growth projections indicates that the federal concern with the air quality-land use relationship has been retained as well as the desire to influence local land use planning processes.

The 1977 Amendments also responded to the concerns raised regarding the issue of non-degradation in clean air areas. The Amendments define three classes and specify the amount of deterioration allowable in each class.[98] While the Amendments appear to strictly limit deterioration, in fact, they provide a fairly simple procedure to redesignate areas and the strictest protection appears to apply only in areas with little development pressure.[99] The determination of what class to put a clean air area in is left to state and local governments. Federal lands appear to have the only really tight restraints.[100] Moreover, the whole procedure does not seem to include mobile sources and the effects of the automobile on these areas do not appear to be adequately dealt with. Overall, the provisions seem, in most cases, to respond to the concern expressed by local governments that the prevention of significant deterioration might interfere with growth. Here again, the potential expansion of federal influence over local decisions supported by the courts was restricted by Congress in response to the complaints of local governments and industry.

In the area of automobile standards, the 1977 Amendments postponed the 90 percent minimum reduction requirements until 1983. For oxides of nitrogen only a 75 percent reduction is required by 1985.[101] Once again, then, State plans are assuming the attainment of auto emission standards in providing for the attainment of ambient air quality standards when it is uncertain whether the automobile standards will actually be achieved. This time, however, the automakers promised Congress that they would meet the standards by the deadlines.

Finally, the 1977 Amendments did include a requirement which, it was argued, would apply real pressure on state and local governments to comply with their requirements. While EPA retained the legal authority to promulgate and enforce state plans, it was recognized that, in practice, this would not happen.[102] Therefore, sanctions, particularly financial ones, were added to the Act to increase federal influence. If states do not submit their plans on time, the EPA Administrator may withhold federal clean air and transportation grants.[103] Clean Air grants can also be withheld from local governments that do not adequately implement their SIP.[104] No federal project can be approved which does not conform to the state plan.[105] Finally, federal sewer grants may be withheld under certain conditions.[106] While the Act gives wide discretion to the EPA Administrator, these provisions could have a significant impact. It was hoped that the threat of these sanctions would stimulate local governments

to cooperate with the federal program. The application of all the sanctions, save one, however, are at the discretion of the EPA Administrator. The only exception is that no new stationary sources can be permitted after July 1, 1979 unless and until EPA approves the plan for the area.

Taken as a whole, however, the 1977 Amendments are a substantial retreat from the 1970 Amendments. Whether placing an increased emphasis on state and local governments for achieving clean air standards will lead to greater success, is problematical. Moreover, though EPA retains significant regulatory power, based on its response to the 1970 Amendments, it is also questionable whether this power will be used.

H. Federal Air Quality Legislation--Conclusion

In general terms there are two ways to view the history of the federal air quality program. These are not contradictory but emphasize different factors. One perspective derives primarily from an appreciation of the limitations of the federal system; the other from an appreciation of the complexity of the air pollution problem. Under the first, the federal response to air pollution increased slowly due to a great reluctance to intrude in an area where state and local governments had primary responsibility. Then, in 1970, the federal government seriously overreacted to the problem and attempted to totally dominate the control effort. This was followed by stiff resistance and, finally, federal compromise. According to Krier and Ursin, the only progress made under

the 1970 Amendments resulted from the federal willingness to cooperate, negotiate and compromise. When EPA responded to state resistance to some of the Amendments' provisions with insistence default, delay, and threats resulted. The ability to carry out the air quality program depended on the federal willingness to work cooperatively with state and local governments.[107]

Under the second view, the early federal response to the air pollution problem was based on the limited knowledge regarding its causes and cures and the fact that it was not yet a serious national concern. By 1970, the amount of available information had grown substantially and, more importantly, the problem had spread in both breadth and depth throughout most of the major population centers of the nation. The federal government, in response to these factors and to substantial public pressure, made an unrealistic commitment to solve the nation's air quality problem quickly. The resulting federal program failed to comprehend the complexity of the problem and the magnitude of the measures which would be required to solve it. In the face of stiff opposition and growing uncertainty regarding the actual extent of the problem, the adequacy of the control measures, the validity of the standards, the capacity of the technology, and the feasibility of the deadlines, the federal government retreated.

To a large extent, each perspective is valid. The federal program resulted from the interaction of a great many forces and both explanations assist in understanding what actually

occurred.

Whatever perspective is chosen, however, it is clear that the influence of the federal air quality program on local decision making expanded greatly between 1955 and 1978. By and large, however, the federal government proceeded cautiously in expanding its authority even after 1970. In fact, most of its vigorous efforts were mandated by the federal courts and legislative deadlines.

On its side, local government generally welcomed the extension of federal involvement. It was only when the federal program intruded on traditional local prerogatives and imposed difficult demands that strong opposition developed. The local resistance was generally successful. It should also be remembered that throughout this period, state and local activity increased as well.

In terms of the specific effects of the federal air quality program on local land use planning decisions, the 1970s ushered in a period of federal concern with the air quality-land use relationship. Despite the defeat, primarily through local opposition, of attempts to control direct land use decisions, the commitment to include land use measures in air pollution control strategies appears to have been retained. The focus of federal attention, however, shifted to the air quality planning process. In fact, through various activities, EPA in the 1970s has given the message to local governments that local land use planning should incorporate air quality

concerns. For example, the federal air quality program, as a minimum, created a heightened level of consciousness on the local level regarding the air quality-land use relationship. This, in itself, represents significant federal influence.

The federal air quality program, then, though no longer requiring the inclusion of the air quality-land use relationship in the local planning process, still seeks to influence local land use planning decisions by indirect means. The chapter on the case studies will explore the success of this effort in one geographical area. Before turning to the case studies, however, it is necessary to describe the setting in which they occur.

FEDERAL AIR QUALITY LEGISLATION

Notes

[1]Alan Gilpin, Air Pollution (St. Lucia, Queensland: University of Queensland Press, 1971), p. 17.

[2]U.S. Comptroller General, Assessment of Federal and State Enforcement Efforts to Control Air Pollution from Stationary Sources (1973), p. 7.

[3]Ibid., p. 7 and Phyllis Dee Lovoca, "The Clean Air Act in Action," Highway User (Winter 1975):13.

[4]J. Clarence Davis, III, Politics of Pollution (New York: Pegasus, 1970), p. 19.

[5]Ibid., p. 19.

[6]George Hagevik, Decision Making in Air Pollution Control (New York: Praeger, 1970), p. 8.

[7]Randell B. Ripley, "Congress and Clean Air: The Issue of Enforcement, 1963," Congress and Urban Problems, ed. F. N. Cleveland and Associates (Washington, D.C.: The Brookings Institution, 1969), p. 226.

[8]Hagevick, op. cit., pp. 88ff.

[9]Ibid., p. 116.

[10]James E. Krier and Edmund Ursin, Pollution and Policy: A Case Essay of California and Federal Experience with Motor Vehicle Pollution: 1940-1975 (Berkeley: University of California Press, 1977).

[11]Ripley, op. cit., p. 228.

[12]Ibid., p. 228.

[13]Quoted in ibid., p. 230.

[14]Krier and Ursin, op. cit., p. 106.

[15]Quoted in Ripley, op. cit., p. 231.

[16]Davies, op. cit, p. 45.

[17]Ripley, op. cit., p. 234.

[18]Quoted in ibid., p. 235.

[19]Kramer, "The 1970 Clean Air Act Amendments: Federalism in Action or Inaction," Texas Technology Law Review 6:47 (1974) p. 51.

[20]Ripley, op. cit., p. 237.

[21]Davies, op. cit., pp. 158-165 discusses a number of these problems.

[22]Ibid., p. 251.

[23]John C. Esposito, Vanishing Air (New York: Grossman Publishers, 1970), p. 22.

[24]Kramer, op.cit., p. 51.

[25]Ibid., pp. 52-53.

[26]Esposito, op. cit., contains a lengthy critique of the federal enforcement effort. See also U.S. Comptroller General, op. cit.

[27]Kramer, op. cit., p. 53.

[28]Ripley, op. cit., p. 226.

[29]Krier and Ursin, op. cit., p. 135.

[30]Esposito, op. cit., p. 22; see also Krier and Ursin, op. cit., p. 173.

[31]Davies, op. cit., pp. 49-51.

[32]Kramer, op. cit., p. 55.

[33]Ibid., p. 57.

[34]Davies, op. cit., p. 52.

[35]Esposito, op. cit., p. 141.

[36]Ibid., p. 152.

[37]Davies, op. cit., p. 159.

[38]Krier and Ursin, op. cit., pp. 11ff.

[39]Kramer, op. cit., p. 58.

[40]Davies, op. cit., pp. 53-55.

[41]Krier and Ursin, op. cit., p. 200.

[42]Frank P. Grad, et al., ed., The Automobile and the Regulation of Its Impact on the Environment, (Norman, Oklahoma: University of Oklahoma Press, 1975), p. 238.

[43]Davies, op. cit., p. 171.

[44]E. J. Kaiser, Promoting Environmental Quality Through Urban Planning and Control (Washington, D.C.: U.S. Environmental Protection Agency, 1974), p. 370. The Act required the setting of primary standards based on health considerations and secondary standards based on welfare considerations. See Davies, op. cit., p. 189.

[45]Amendments to Clean Air Act of 1970, Sections 109(a)(1), 110(a), 110(f). According to Jeffrey Kessler in "The Clean Air Act Amendments of 1970: A Threat to Federalism," Columbia Law Review 76 (October 1976): 796, by 1971, standards for six pollutants had been adopted, three of them related to automobile emissions.

[46]1970 Amendments, ibid., Sec. 110 (a) (2).

[47]Ibid., Section 110 (c) (i).

[48]Ibid., Sections 110 and 111.

[49]Ibid., Section 113.

[50]Ibid., Section 304.

[51]Ibid., Section 202 (a), (b).

[52]Lovoca, op. cit., p. 14.

[53]Eli Chernow, "Implementing the Clean Air Act in Los Angeles: The Duty to Achieve the Impossible," Ecology Law Quarterly 74 (1975): 538.

[54]Kathleen King, "Federal Land Use Controls for Clean Air," Environmental Affairs v. 3, n. 3 (1974): 507.

[55]Ibid., p. 507.

[56]Quoted in Daniel R. Mandelker and Susan B. Rothschild, "The Role of Land-Use Controls in Combating Air Pollution Under the Clean Air Act of 1970," Ecology Law Quarterly (Spring 1973): 240. See Robert J. Rauch, "EPA Regulations of Indirect Sources: A Skeptical View," Harvard Journal of Legislation 12 (1974) for an argument to limit the federal interest in this area.

[57]Mandelker and Rothschild, op. cit., p. 240.

[58]Ibid., pp. 254 and 274.

[59]Quoted in King, op. cit., p. 510.

[60]Ibid., p. 509.

[61]Mandelker and Rothschild, op. cit., p. 265.

[62]This discussion is based largely on Rauch, op. cit., pp. 113-118.

[63]38 Federal Register 6279 (1973) as quoted in Rauch, ibid., p. 116.

[64]Walter Rockenstein, II, "Statement on Behalf of the National League of Cities," in U.S. Senate Committee on Public Works, Subcommittee on Environmental Pollution, Hearing on the Implementation of the Clean Air Act--1975, p. 678.

[65]Arthur J. Magida, "New Clean Air Provisions Respond to Local Complaints," National Journal 7 (November 22, 1975): 1590.

[66]U.S. Environmental Protection Agency, "National Ambient Air Quality Standards: Implementation Plans," Federal Register Vol. 20, No. 203 (October 20, 1975): 49048-49063 (40 CFR Part 51).

[67]Ibid., p. 49053.

[68]Krier and Ursin, op. cit., p. 297.

[69]Ibid., p. 310.

[70]Chernow, op. cit., see Particularly p. 369.

[71]Magida, op. cit., p. 1589.

[72]U.S. Supreme Court, 97 S. Ct. 1635 (1977). See also Vaughan Finn, "The Clean Air Act Amendments of 1970: Can Congress Compel State Cooperation in Achieving National Environmental Standards," Harvard Civil Rights--Civil Liberties Law Review 11 (1976): 701-722 and Kessler, op. cit.

[73]Grad, op. cit., p. 360 and Lovoca, op. cit., p. 18.

[74]Mandelker and Rothschild, op. cit., p. 272. Also testimony of Jean Packard and Walter Rockenstein, II in Hearings on the Implementation of the Clean Air Act--1975, op. cit., pp. 679 and 687.

[75]Grad, op. cit., p. 332.

[76]Lovoca, op. cit., pp. 17-18.

[77]Ibid., p. 18.

[78]Rockenstein Testimony, op. cit., p. 684.

[79]Lovoca, op. cit., p. 18.

[80]Trumbole, Robert E., et al., "A Summary of Clean Air Act Oversight Hearings," in U.S. Senate, Committee on Public Works, Subcommittee on Environmental Pollution, Hearings on the Implementation of the Clean Air Act--1975 (1975), p. 5.

[81]Davies, op. cit., p. 186.

[82]Carl M. Shy, M.D. and Ph. D., "Testimony on Behalf of the American Lung Association," in U.S. Senate, Committee on Public Works, Subcommittee on Environmental Pollution, Hearings on Clean Air Act Amendments of 1977 (1977), Part 2, p. 165.

[83]Krier and Ursin, op. cit., p. 310.

[84]"Clean Air Act Amendments of 1970: A Congressional Cosmetic," Georgetown Law Review 61 (1972): 172-3 and 179-184.

[85]Grad, op. cit., pp. 362-363.

[86]Council on Environmental Quality, Environmental Quality --1977: Eighth Annual Report (Washington, D.C.: Superintendent of Documents, December 1977), p. 151.

[87]Trumbole, et al., op. cit., p. 15.

[88]Magida, op. cit., p. 1590.

[89]Chernow, op. cit., p. 581.

[90]Davies, op. cit., p. 56.

[91]Hearings on Clean Air Act Amendments of 1977, op. cit., Part 3, p. 21.

[92]Amendments to the Clean Air Act, August, 1977, Sections 110 (c) (2) (B) and 110 (a) (5) (B).

[93]Ibid., Section 110 (a) (5) (A) (i).

[94]Ibid., Section 110 (a) (2) (B).

[95]Ibid., Sections 108 (f) (i) (A) and 172 (b) (2).

[96]Ibid., Sections 110 (a) (1), (a) (2) (A) and Sections 172 (a) (1) and (2).

[97]Ibid., Sections 174 and 172 (b) (9) and (10).

[98]Ibid., Section 163.

[99]Ibid., Section 164.

[100]Ibid., Section 169A

[101]Ibid., Section 202 (a) (3) (A) (ii).

[102]Ibid., Sections 110 (c) and 113.

[103]Ibid., Section 176 (a).

[104]Ibid., Section 176 (b).

[105]Ibid., Section 176 (c)

[106]Ibid., Section 316 (b).

[107]Krier and Ursin, op. cit., p. 341.

IV.

THE LOCAL SETTING - SANTA CRUZ, CALIFORNIA

This chapter describes the context of the four case studies described in the next chapter. The chapter covers the following areas:

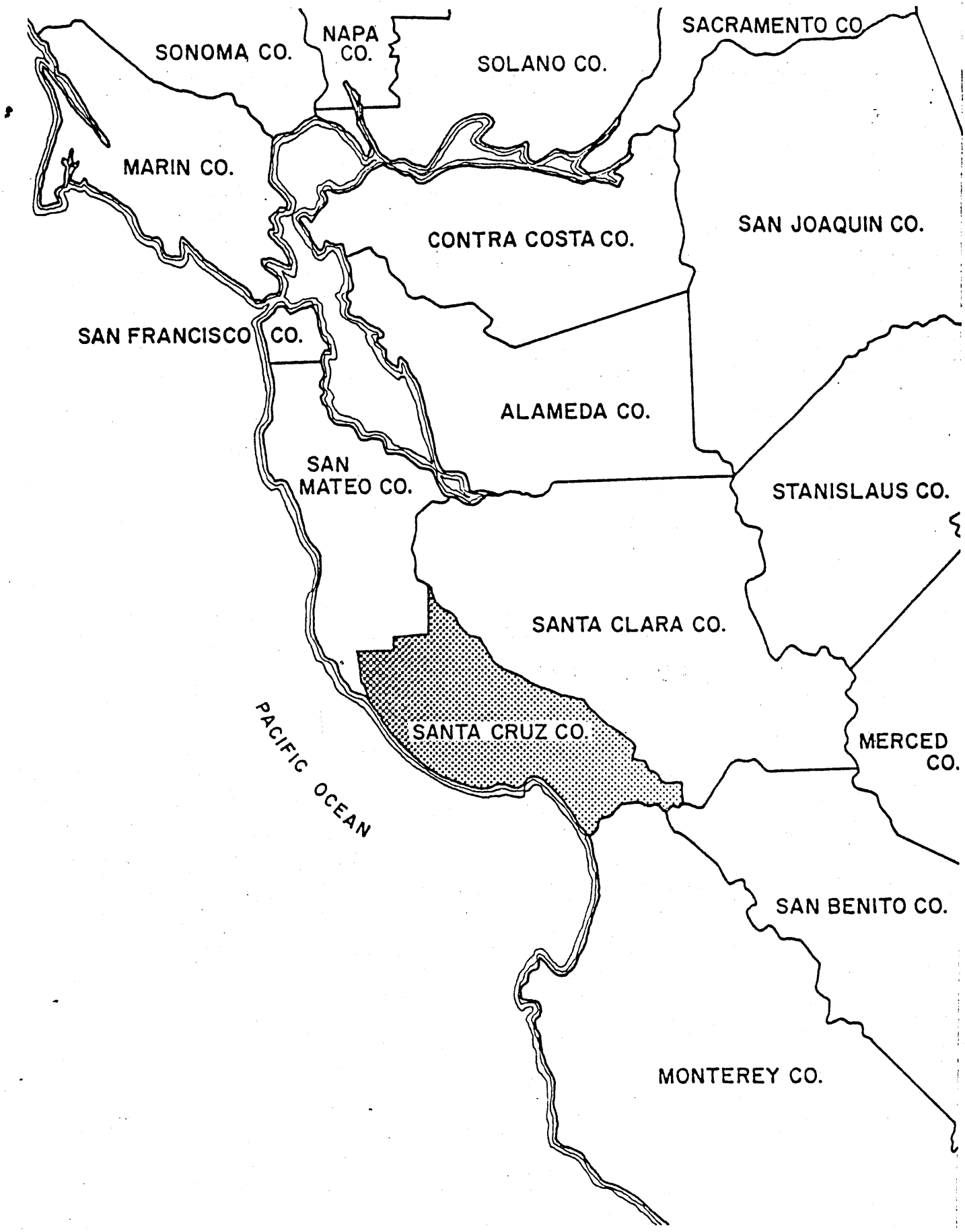
- general background information on Santa Cruz City and County;
- the local planning process in California;
- local air quality conditions;
- the major actors in the planning processes.

A. Santa Cruz City and County - Background Information

1. Location - Geography

Santa Cruz County is located in northern California approximately 90 miles south of San Francisco and 30 miles west of the City of San Jose. It is also located on the northern and eastern shores of Monterey Bay (see Figure 1). The County is one of the smallest in the State, having an area of only 441 square miles. The City of Santa Cruz is located at the northern end of Monterey Bay (see Figure 2).

The topography of the County has indirectly guided and directed much of its past growth. Along the shoreline of the County, there is a narrow coastal shelf of varying width. In the southern portions of the County the shelf widens into a prime agricultural area. Further north, the coastal shelf is the location of the major urbanized portions of the County



scale: 1 inch = 15 miles

Figure 1.

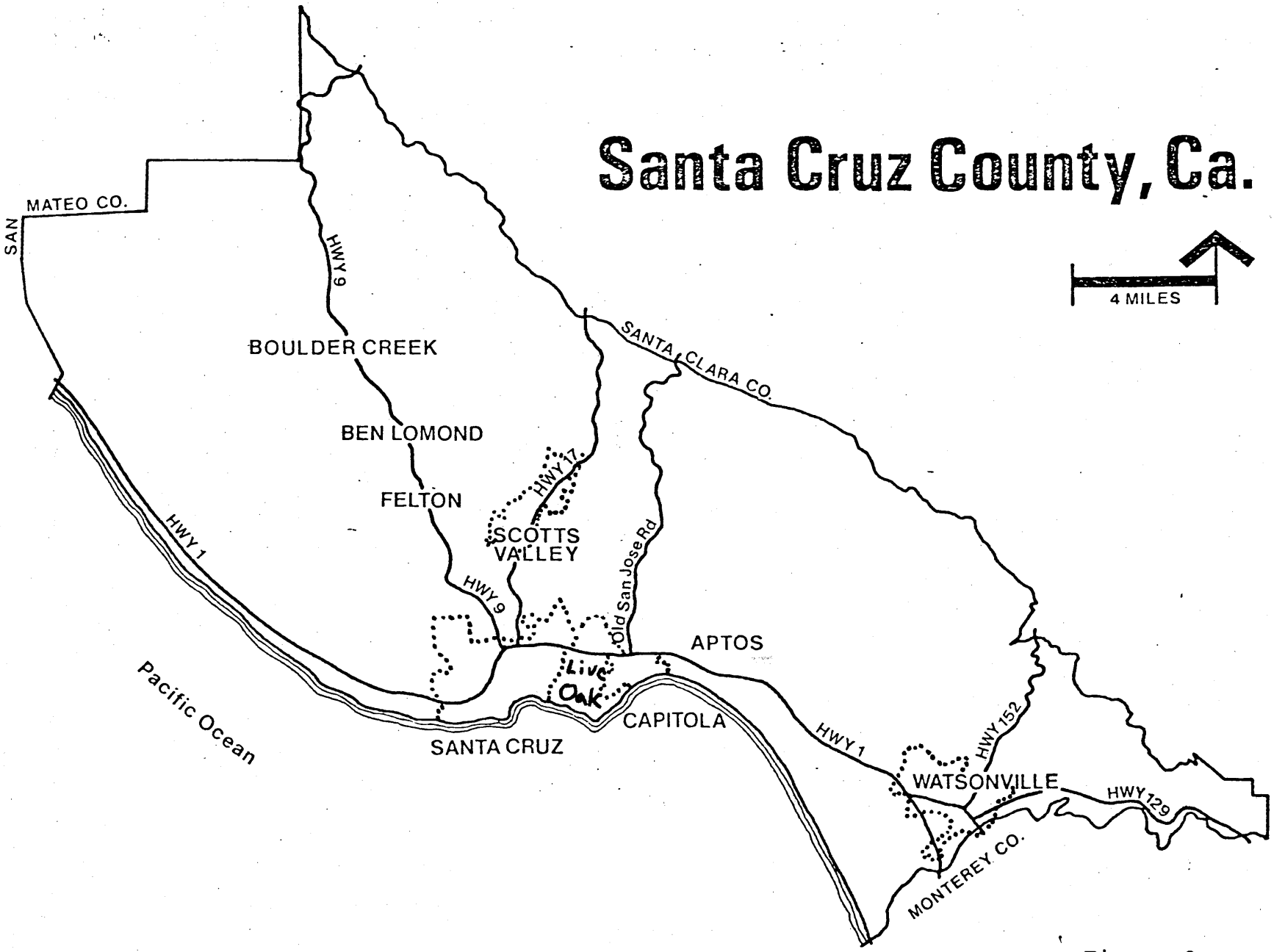

Santa Cruz County, Ca.
4 MILES
SAN MATEO CO.
HWY 9
BOULDER CREEK
BEN LOMOND
FELTON
HWY 17
SCOTTS VALLEY
HWY 1
HWY 9
Old San Jose Rd
SANTA CLARA CO.
APTOS
Live Oak
CAPITOLA
SANTA CRUZ
Pacific Ocean
HWY 1
HWY 152
WATSONVILLE
HWY 129
MONTEREY CO.

Figure 2.

in the City of Santa Cruz and what is called "the mid-county," which includes the Live Oak area.

The County is traversed by many narrow canyons extending from the coastal shelf to the ridge line of the Santa Cruz Mountains. Most of the County is still heavily forested and mountainous, especially in the central and northern portions.

2. Early History

Spanish explorers first reached Santa Cruz in 1769 and one of the original California missions was established in 1791 in what is now the City of Santa Cruz.

The Santa Cruz area grew slowly as the surrounding mountains prevented easy access by land. With the California gold rush and the subsequent explosive growth of the San Francisco Bay area, Santa Cruz became a prime source of needed raw materials. Lumber, lime, sand, explosives were all exported. Tanning was also an important industry. By the end of the nineteenth century, almost all of the County's original redwood trees had been cut. Statewide concern over the loss of the redwoods led to the establishment of California's first State park in Santa Cruz to protect some of the few original redwoods left.

The agricultural industry was fully developed in the South County area by the mid-1800s. The apple business was booming there in the 1870s and 1880s. Also, by the late eighteen hundreds, railroad lines had been extended into Santa Cruz and replaced the more dangerous ocean shipping of local products. The railroad lines also stimulated the development of the

City of Santa Cruz as a resort for the wealthy of San Francisco. Through the years, the function of the City as a resort area changed. The wealthy went elsewhere and Santa Cruz became a major retirement area for lower and middle income people.

Santa Cruz grew slowly in the early nineteen hundreds and it remained predominantly rural until the 1950s.

3. Demographic Characteristics

Three factors contributed to the increased growth pressure which the Santa Cruz area started to experience in the late 1950s and early 1960s. First, the Santa Clara Valley which had been a suburb of San Francisco became the fastest growing area in California and, quickly, a major urban area in its own right. The growth pressures, then, spread out from there and stimulated suburban development in adjacent areas, which included Santa Cruz. Related to this was the fact that with the urbanization of the suburbs of Los Angeles and the Santa Clara Valley, new immigrants to California sought other areas in which to settle.

The second factor causing growth pressures in Santa Cruz also concerns the filling up of other areas. While the climate in Santa Cruz and its location made it a desirable resort area, its history as a retirement and vacation community for the lower income led wealthier people to go elsewhere. Santa Cruz, much to the chagrin of the local chamber of commerce, even had been characterized as "a seedy little resort town." However, other areas considered more desirable were getting too crowded. Pressure on Santa Cruz, therefore, increased to

provide housing and recreational facilities for higher income retirees and visitors.

The final, and most visible, cause of the rapid population growth in Santa Cruz resulted from the establishment of a University of California campus in the City of Santa Cruz in the early 1960s. The University campus had a profound impact on the community's cultural and political life as well as on its population growth. Though still relatively small, with a current student body of approximately 6,000, it caused a major share of the City's growth in the late 1960s and early 1970s.

The current population of the County of Santa Cruz is approximately 165,000. The City population is about 38,500. While the annual growth rate has tapered off somewhat in the 1970s over the 1960s rate, the City of Santa Cruz is still growing significantly faster, at 3.8 percent, than the State average of approximately 1.2 percent. The growth rate of 5 percent for the County is one of the fastest in the State.

While projections of future growth vary depending on the assumptions made, the City Planning Department estimated that the City's population would reach 47,000 by 1990 if current growth trends and policies were maintained. This projection probably understates the demand since developable land within the City is becoming scarce. Population projections for the County range from 218,500 by 1990 to approximately 250,000. One recent study estimated that the County population in the year 2000 would be 310,300. Irrespective of the exact projections, it is anticipated that both the City and County will

continue to experience substantial growth pressures, even though the University's growth has leveled off.

In terms of the age distribution of the population, there has been a shift from an unusually high percentage of elderly to an unusually high percentage of young people. In the 1960s and early 1970s, Santa Cruz, especially the City, was noted for its concentration of seniors. The County percentage was much higher than the State average and the City had one of the highest percentages in the country. This situation has now changed, particularly in the City. The percentage of elderly in the City and County, though, is still higher than the State average.

As a result of the relatively high percentages of students and elderly, the average household size in both the City and County is below that of the State. This decline has generated increased pressure for housing. Even if housing construction keeps up with population growth, the vacancy rate will increase where average household size has declined.

In terms of the ethnic background, approximately 20 percent of the County population and 10 percent of the City population are minorities, predominantly Mexican-Americans.

Most households in the County own their own homes (approximately 60 percent), although the percentage has been declining. The City has experienced a steady decline in homeownership and, for the first time in 30 years, renters now outnumber homeowners.

The population of the City and County is highly mobile.

In this, they are similar to the State as a whole. High mobility tends to indicate the State's rapid growth due to in-migration.

Income statistics are notoriously unreliable and this is true for Santa Cruz. The following figures display the results of the 1970 census:

FAMILY INCOME - 1970

City and County of Santa Cruz and the State of California

	City of S.C.	S.C. County	California
Number of Families	7,985	32,457	5,001,255
Mean Income	$9,890	$10,295	$12,227
Median Income	$8,516	$ 9,078	$10,729

Source: U.S. Census, 1970 (Draft City of Santa Cruz Housing Element)

While the precise numbers are undoubtedly inaccurate, the census does indicate that the income of both the City and County population is below the State average. This is consistent with the previous characterization of Santa Cruz as a lower income area. Some recent studies suggest that this situation is changing, particularly in the County, and that income levels are beginning to approximate the State average. Other studies have argued that both the City and the County continue to have large percentages of lower income people.

4. Housing Characteristics

It is generally conceded that a housing crisis currently exists in both Santa Cruz City and County. Housing prices

have soared and the vacancy rate remains high despite an unprecedented amount of construction in recent years.

Neither overcrowding nor housing deterioration are major problems in the Santa Cruz area, with current estimates of both conditions being below 10 percent.

The major housing problem is cost and housing prices have increased at unprecedented rates over the past decade. Median sales prices of houses available on the market in the City of Santa Cruz have more than tripled in just ten years. Price increases in the County have been just as spectacular. While housing prices have grown rapidly in recent years throughout California and, in fact, the nation as a whole, they appear to be growing faster in the Santa Cruz area. There is some indication that this trend may be slowing at least relative to housing prices in California.

Rent levels also have increased tremendously in the City and County over the past ten years.

Increases in the cost of housing have in no way been matched by income gains. The following chart graphically depicts the recent changes:

COMPARATIVE COST INCREASES

Percentage Increase from 1970 - 1977

	Increase
Median House Price - City of Santa Cruz[1]	193%
Median Advertised Rents - Northern Santa Cruz County[2]	141%
Overall Construction Costs - San Francisco Bay Area[3]	109%
Consumer Price Index, All Items - San Francisco Bay Area[4]	56%
Household Income - Santa Cruz County[5]	54%

Sources:
1 - S.C. Board of Realtors MLS Annual Summaries
2 - S.C. County HAC and Housing Authority Rental Surveys
3 - Bank of America Appraisal Dept. Cost Study (3 bdrm, 1-3/4 bath home of 1,570 sq. ft. and 2 car garage)
4 - Department of Labor, Bureau of Labor Statistics
5 - State of California Franchise Tax Board '70-'75; S.C. County C.R.A. Estimate '76-'77.

Source: Draft Santa Cruz City Housing Element

The obvious results of these recent trends is that lower income families, particularly, are being squeezed out of the housing market and the continued viability of Santa Cruz as a mixed income community is in question.

5. Local Economics

The major components of the Santa Cruz County economy are agriculture, tourism and government. Construction is also

important and, to a lesser degree, so is timber harvesting. The County has almost no heavy industry, though light manufacturing is a significant part of the economic base. One of the reasons for the limited industrial development is the problem of access into the County. The major highway from the Santa Clara area, Highway 17, goes over the Santa Cruz Mountains, has only two lanes and is fairly dangerous. Attempts during the 1960s to convert Highway 17 to freeway status were successfully opposed by Santa Cruz residents.

Highway 17 has also limited the amount of commuting possible, though it has been on the rise. Approximately ten percent of the City's labor force and 20 percent of the County's labor force work outside the County. On the other hand, almost 80 percent of the City's labor force lives in the City. The possibility of Santa Cruz becoming a predominantly bedroom community is a real fear in the area. Santa Clara County plans, also, appear to anticipate increased commuting from the Santa Cruz area. The capacity of Highway 17 is considered the major limiting factor, although there is currently debate concerning the amount of capacity which remains.

The seasonal nature of the agriculture and tourism industries have created structural unemployment problems in the County. Despite major increases in the number of jobs over the last ten years, the unemployment rate has stayed relatively high. While the agricultural industry has declined somewhat as a result of the conversion of prime agricultural land to

other uses, the tourism industry has continued to expand over recent years. The mild climate and great natural beauty of the County combined with its easy accessibility to major population centers are the prime reasons for this.

6. Live Oak

One of the case studies concerns the development of a general plan for the Live Oak area, which is also the major growth center in the mid-county area. Live Oak is currently the major urbanized area in the unincorporated portion of the County. It is immediately adjacent to the southern boundary of the City of Santa Cruz and extends along the coastline to the City of Capitola.

There are approximately 3,000 acres in Live Oak and its 1976 population was 22,595. The County's future growth plans favor the concentrating of development as much as possible in already urbanized areas and Live Oak, with substantial amounts of vacant land yet highly urbanized, has been targeted for a significant amount of future County growth. The projected population is 32,000 in 1989 and 42,000 in 1999. This represents a controlled growth estimate.

Live Oak contains a disproportionate share of the County's elderly and low income population. This is partially due to the fact that approximately 20 percent of the area's housing stock consists of mobilehomes. The area's median income is well below the County's average and the percentage of owner occupants is also lower than the County as a whole (54% vs. 60%). Like the City and County as a whole, the percentage of

elderly has dropped in recent years (1970-1976) while those in the 25-34 age group have increased by 96 percent.

The concentration of lower income people in Live Oak partially explains, at least, why Live Oak has not been annexed to the adjacent cities. With a minimal industrial and commercial tax base and a lower income population, there was little financial incentive for the cities to annex it. In addition, while Live Oak does have a greater level of urban services than the rest of the unincorporated area of the County, significant service needs remain to be filled.

Live Oak shares with the rest of the County the current housing crisis with soaring housing prices and rent levels, and a low vacancy rate. In addition, since much of the County's growth is occurring in Live Oak, traditional low income neighborhoods are being infiltrated with new, higher priced housing. This, in many areas, has created pressures on the lower cost stock to increase in value.

7. Local Politics

The traditional political climate in both Santa Cruz City and County was conservative and growth oriented. This was due partly to the large number of senior citizens, the agricultural economy in the South County and the general rural quality of life. The business community dominated political life, especially in the City.

Two major factors brought about substantial changes in the local political climate. One was the environmental movement. The growth of environmental sensitivity nationwide had

A strong effect in Santa Cruz. As a rapidly growing area which still had a great deal of natural beauty, the future of the County and its desirability as a place to live began to worry a great many local citizens. The second factor, somewhat related to the first, was the establishment of the University of California campus in the City of Santa Cruz in the mid-1960s. Not only the students but the faculty and many of the employees tended to be more liberal in their political views than the rest of the community. The impact of the students increased particularly starting in 1972 when the eighteen-year-old vote was granted. The political influence of the University has been felt strongest in the City but has also been felt in the County as a whole.

In the early nineteen seventies, a number of environmental controversies shook the City. The city council had rezoned much of the city in the late 1960s to provide for increased population. Among other features, the zoning ordinance included absolutely no height restriction for a number of areas. An eleven-story motel was built in the early 1970s and two sixteen-story towers were proposed. Until then, few buildings in the City were over three stories high. A major convention center, hotel, shopping center development was also under consideration at this time for the major remaining piece of open space land along the city's coastline. Finally, a large southern California development corporation proposed a development on the northern boundary of the City which would provide for almost double the City's population. All these

projects generated fierce opposition and all but the motel were eventually defeated. The 1973 City Council election was dominated by these issues and the environmental candidates won in a major upset.

However, since only three of the seven seats were up in the election, the environmentalists did not gain control of the Council and, in fact, this was the only time they succeeded in electing council candidates. However, the influence of the environmentalists has been great. Besides the victories on the major development proposals, the moderates and conservatives in control of the Council who tend to favor growth have had to move cautiously and consider the environmental issues. In certain respects, the environmentalists have suffered from their success, which left them without clear issues to rally around. Recently focus has shifted to an advocacy of strong growth management and the preservation of the remaining major natural areas that border the City. The City elections coming up in April 1979 may well be dominated by these issues.

In the County, the adjustment to environmental concerns at first occurred more slowly and with less drama. A majority of the Board of Supervisors were elected in the early seventies with some environmental sensitivity and began to impose environmentally oriented restrictions on development. This process was accelerated by the election in 1974 of a strong environmentalist representing the district which included most of the City. This was considered one of the most liberal districts in the State, primarily because the University is

within its boundaries. Soon afterwards another strong environmentalist was appointed by the Governor to replace a Supervisor who resigned. The movement to regulate development to protect the environment and, in fact, to slow down the County's rapid growth accelerated. In 1976, one of the Board's environmentally oriented members was defeated and was replaced by an extreme conservative. At the same time, a strong environmentalist upset one of the Board's conservatives and the environmentally concerned majority was maintained.

The new Board majority continued the efforts to restrain growth and protect the environment by, for example, adopting strong septic tank, grading, and riparian corridor protection ordinances and by initiating a major effort to develop a County growth management system. They generated a significant amount of opposition in the development community and a well financed recall campaign led to the ousting of two of the Board environmentalists. At the same election, 56 percent of the electorate approved a growth management ordinance which provided for a restricted growth rate and the protection of the County's environmental resources.

The ordinance also contained a provision requiring that 15 percent of all newly constructed housing be affordable by people with average or below average incomes. This provision indicates one of the key features of the local environmental movement and a reason for its successes. That is, the concern with providing housing for low and moderate income people. Environmentalists have supported subsidized housing from the

beginning and have also advocated increased human services for those in need. In California, a constitutional amendment requires that a local referendum must be passed before a public agency can own or build housing in a community. Last June housing referenda were passed in both the City and the County by wide margins. The City voters, also, had passed an earlier referendum. Environmentalists also supported a rent control initiative in the City in November 1978, which was barely defeated.

Not all the jurisdictions have shared the history just outlined. The Cities of Watsonville and Scotts Valley, to be described later, are consistently both conservative and growth oriented. The City of Capitola has shifted significantly and in the last Council election, for the first time the voters elected an environmentally sensitive majority.

The local political climate, then, is highly charged and characterized by a good deal of conflict. The communities are in transition and the traditional consensus has broken down.

B. The Local Planning Process

In California, State law has played a major role in determining the nature of local land use planning.

1. General Plan Requirements

The California Planning and Zoning Law (Section 65300 et seq. of the California Government Code) requires the adoption by all general purpose local governments of a comprehensive, long-term general plan for the physical development of the

city or county, and describes the various elements that may be included. Certain elements are required by law, such as land use, circulation, conservation, and housing. Others, such as historical preservation, may be added according to the needs of the locality. Local jurisdictions are also permitted to develop area plans to cover portions of their area.

The General Plan is considered the totality of all the functional elements and any area plans which may be adopted. As a new element or area plan is approved it becomes part of the General Plan and if it is inconsistent with any other portion of the plan, it takes precedent. The intention of the State legislation is to create one unified and integrated plan. However, since planning is a slow process and the State has required the preparation of various elements at different times through the years, it is often very difficult to point with any certainty to any one document that can accurately be called the local general plan.

This problem is particularly severe for Santa Cruz County. The original general plan was prepared in 1961. Since that time a number of area plans have been adopted, including the Live Oak Area Plan, which superseded the 1961 Plan for particular areas. At the same time various elements have been adopted which in some cases superseded area plans and in some cases were superseded by them. While there has been an attempt to keep the general plan consistent, the changes in the County's policy direction through the years have made that impossible. There currently exists, then, a hodgepodge of

planning documents that, at times, substantially differ in their planning policies for different areas of the County. Obviously, this situation creates a hardship not only on the staff as they attempt to apply the policies but on the public as well as they attempt to understand the policies.

The County is currently in the process of attempting to integrate the various portions of the general plan as part of the adoption of a comprehensive growth management system. The system was mandated by the voters in June 1978 through the adoption of the growth management ordinance mentioned previously. Whether the system will actually resolve some of the contradictions between the various parts of the general plan is questionable. However, it is hoped that a consistent, understandable system for regulating development will result from the effort.

In any event, the Live Oak Area Plan, the subject of one of the case studies, represents the latest County policy for the area. No new element applicable to it has subsequently been adopted.

While the City's General Plan shares some of the problems just described for the County, it is less complicated in that the City is small enough not to have required many area plans. The various elements which have been adopted have included new policies for the City but it has been possible to more clearly identify the inconsistencies with the 1964 General Plan. The major problem with the City's General Plan is that it is hopelessly outdated and no longer reflects the views of

the vast majority of the residents.

In addition to the General Plan and its elements, State law (Chapter 1253, California Statutes of 1972) required the preparation of a Regional Transportation Plan (RTP). In Santa Cruz, the region has been defined as the county as a whole and an RTP has been prepared and adopted by the agency granted responsibility for developing it, the Transportation Commission. While the law does not require that each local government within the region adopt the RTP, the RTP becomes an element of the General Plan of any jurisdiction which does adopt it. Santa Cruz County, though not Santa Cruz City, has done so. The RTP was, also, required to be consistent with the local general plans as much as possible.

The RTP is relevant here for two reasons. First, the Air Quality Element of the RTP is the subject of one of the case studies. Second, the Transportation Commission and the County of Santa Cruz at the time they adopted the RTP added an aggressive transit goal calling for 30 percent of all trips in 1995 to be by transit. Since the current percentage is approximately 5 percent, the achievement of this goal would represent a significant change in the transportation habits of the population. The City of Santa Cruz, while not adopting the RTP has expressed support of the 30 percent goal.

The 30 percent goal has had both positive and negative impacts on local planning decisions. First of all, no concrete program has been developed to assure the 30 percent goal will be achieved. On the other hand, the assumption is made

in most planning documents that, somehow, the goal will be reached. This at times has led to the minimization of projected air quality problems. It has also minimized the need for land use measures to improve air quality since the achievement of the transit goal would all but eliminate the problem.

It is true, however, that in some cases, such as the Live Oak Plan, a rationale for certain land use policies was that they would help achieve the transit goal. The same policies would obviously, also improve air quality. It is also true that definite steps have been taken to expand the transit system. In June 1978, the voters approved the financing of the transit system with sales tax revenue and, thereby, substantially increased its financial base. The basic contradiction, however, between a low density land use pattern in the County and a feasible transit system has not been seriously faced. Although transit ridership has increased greatly in the last few years, so has the number of automobile trips, though not quite as fast. The transit system is still serving primarily the transit dependent.

2. Zoning Consistency

In California, a State law (Section 65860 of the California Government Code) passed in the early 1970s requires that local zoning be consistent with the general plan. The intent is to require the implementation of the general plan goals and policies. Its passage probably resulted from the frustrations felt by the local citizens when the general plans were

not utilized to guide development or when they were, in fact, negated by zoning and public works development.

While the requirement of zoning consistency has increased the clout of local general plans, this has been somewhat mitigated by the fact that, in many cases, the policies in general plans are so general, it is impossible to determine whether the zoning ordinance is consistent with them or not. In other cases, general plans will include a range of development densities for a particular area and a good deal of confusion develops over whether the zoning should be consistent with the lower end or the upper end of the general plan density.

On the other hand, the zoning consistency requirement has tied the zoning process more closely to the general plan process. In Santa Cruz County, for example, immediately after a new general plan is adopted, such as the Live Oak Area Plan, the process begins to change the zoning in the area to assure consistency. The State requirement has also increased the appreciation of general plans as action documents. Greater thought is now given as part of their preparation to the means of implementing them. They are no longer seen simply as a statement of goals but as actual guides to action.

3. CEQA

The California Environmental Quality Act (CEQA) was adopted in 1972 and requires that potential environmental impacts be considered prior to the approval of most development projects. The California Supreme Court in 1973 decided that

the CEQA requirements applied to private as well as public projects. The State has also determined that environmental impact reports (EIRs) must be prepared for local general plans and zoning ordinances.

Air Quality is one of the impacts to be considered as part of the environmental review process and some observers have argued that the EIR process will prevent the deterioration of an area's air quality. This point has some validity in terms of major development projects, such as highways and factories, and in some cases appears to have been used to justify the disapproval of a project. As a minimum, it assures that the possible effects of developments on air quality will at least be considered. On the other hand, since air quality usually deteriorates as a consequence of many development decisions and most projects by themselves have a relatively minor impact, CEQA has not, by itself, been an effective tool for protecting air quality. In addition, CEQA has not been interpreted by the courts to require that projects be turned down even when they have substantial adverse environmental impacts. Developments, then, which will result in substantial increases in air pollution can be approved under the Act. Local governments, for example, would be hard pressed to forego the economic benefits of a large shopping center because of its adverse effects on air quality. The controversy regarding indirect source review is evidence of this.

CEQA, then, provides a tool for the consideration of the impacts of local land use decisions on air quality, though,

by and large, it has not been effective at preventing air quality deterioration.

4. The Proposed State Mandated, Local Air Quality Element

In 1972, the State of California seriously considered requiring local governments to prepare an Air Quality Element as part of their general plans. If this had been approved, the incorporation of the air quality-land use relationship in the local land use planning process would have been assured. The story of this proposal provides an interesting sidelight to the major concerns of this thesis.

First of all, according to the Program Manager of the State Air Resources Board's Land Use Planning Program, the suggestion for a local air quality element was not influenced by the federal concern with the air quality-land use relationship. It derived from an independent concern with the effects of land use decisions on air quality.

Chapter 1338 of the State statutes of 1972 called for a report to the Legislature on proposed guidelines for the preparation of an air pollution control element in city and county general plans. Implied in the legislative language is the determination to adopt the requirement for such an element.

The report prepared under the legislation, however, recommended against requiring an air quality element. In the view of the consultant and the State agencies involved, air quality management could only be integrated effectively with land use and transportation planning on an air basin-wide

basis. The consultants recommended that regional agencies be designated for allocating air quality emissions to localities in each region and proposed the implementation of the Emission Allocation Planning process, which was described earlier herein.

Under this procedure, local plans would still eventually have to be modified in order to conform to the emission limits allocated to the area. The recommendations simply called for a regional agency to be responsible for the overall planning and the allocation of the emission limits.

The recommendations of the consultant were submitted to the Legislature in a proposed bill but died in Committee. Significant controversy developed concerning which regional agency should be given responsibility for the planning. Moreover, the State administration was afraid to support the bill. No subsequent independent State effort to require local consideration of the air quality-land use relationship was ever proposed.

In a sense, the originally proposed air quality element would have been a first step in gaining serious local consideration of the air quality implications of land use planning decisions. Later attempts by the State to provide technical assistance and establish a regional formula for allocating emissions may have been better received. The consultants, by proposing a comprehensive process incorporating all aspects of the situation created a political problem which could not be overcome.

A final point regarding the State's air quality program. As mentioned earlier, the State of California's program predates the federal efforts and in the early years, served as a model for it. Since this thesis is primarily concerned with the federal-local interaction particularly around land use planning issues, the State program has not been described in detail. For a detailed analysis of California's air quality efforts, Krier and Ursin's study entitled Pollution and Policy should be consulted. It should be stated, however, that in terms of the air quality-land use relationship, the State efforts, except for the case just discussed, appear to have stemmed from the influence of the federal program.

C. Air Quality Conditions

Santa Cruz does not have a history of extensive air pollution. In fact, until recently the area had relatively clean air. The air quality has now started to deteriorate and federal standards have been violated. While there is debate as to the causes of these violations, there is also a widespread concern with the potential of continued rapid population growth to create serious air quality problems. Santa Cruz, then, is a good example of a growing area, adjacent to highly developed urban concentrations, where air quality has begun to deteriorate and threatens to become worse.

1. Background

Santa Cruz County is part of what is called the North Central Coast Air Basin which also includes Monterey and San Benito Counties. The air basin covers an area of 5,159 square

miles and has four mountain ranges and two major valleys (see Figure 3). The topography and the meteorological conditions over the Pacific Ocean have a great effect on the basin's air quality. In Santa Cruz County, for example, coastal mountains exert strong influence on atmospheric circulation and generally result in good air. On the other hand, in the autumn the Pacific high pressure cell occasionally holds in place a relatively stationary air mass allowing pollutants to build up over a period of a few days. Late summer, fall and early winter are seen as the times of year when weather conditions are most likely to cause pollution problems. Climatic conditions are also blamed for the transport of air pollution from other air basins during this time of year.

2. The Air Quality Problem

The only pollutant which has been a problem in the air basin is oxidants. Oxidant pollution is formed by photochemical reactions involving hydrocarbons and nitrogen oxides in the presence of sunlight. Automobiles are the major source of oxidant emissions. Eye irritation caused by oxidants starts to occur when the concentration in the air reaches .10 parts per million (ppm).

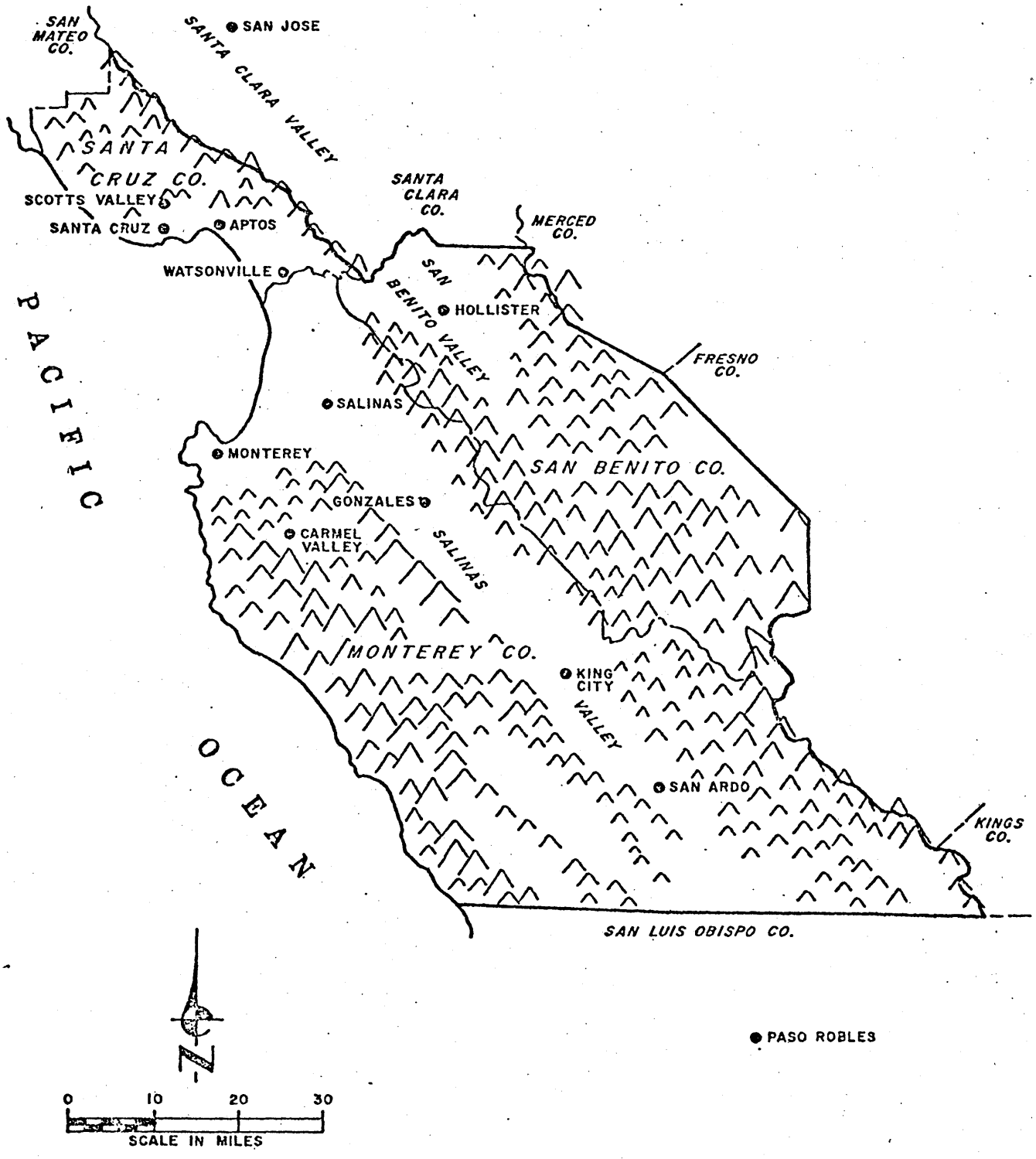
The federal oxidant standard of .08 ppm has been violated a number of days each year in the basin at least since 1973 as has been the State standard of .10 ppm. However, little was done about it until 1977 because of the controversy regarding the cause of the violations.

The Federal Highway Administration requires, as a

FIGURE 3.

NORTH CENTRAL COAST AIR BASIN

AMBAG Air Quality Conditions and Trends in the Monterey Bay Region



precondition for receiving federal funding that the regional planning agency assess on an annual basis the consistency of an area's Regional Transportation Plan (RTP) and the State Implementation Plan (SIP) for achieving and maintaining the federal ambient air quality standards. These so-called Consistency Statements have been the focus of the debate regarding the air quality problem.

As a result of air quality monitoring in 1973, and the discovery of violations of the federal and state standards, Monterey County was designated in 1974 as an Air Quality Maintenance Area (AQMA). Air quality in Monterey is worse than that in Santa Cruz primarily because of a number of major polluting industries in the County. A large power plant is located there as well as a producing oil field.

While certain actions were taken as a result of the AQMA designation to incorporate air quality considerations in ongoing programs, the growing understanding of the federal requirements for AQMAs led to a strong negative reaction to the designation. Three concerns were raised: 1) it was felt that if the designation were to be made, all the counties in the air basin should be included; 2) it was argued that the problem was episodic rather than regular in nature and, therefore, the stringent controls required in AQMA plans would be neither warranted nor cost-effective; and 3) there was evidence that much of the air pollution problem in the basin resulted from the "importation" of pollutants from other air basins. As a result of the local opposition the State Air

Resources Board withdrew the AQMA designation.

The 1976 Consistency Statement prepared by the Association of Monterey Bay Area Governments (AMBAG) maintained the local arguments against AQMA designation in spite of the fact that violations of the standards persisted and even increased. Transport from other basins was emphasized as the likely cause of the regional problem.

It appears that neither the State ARB nor the EPA were willing to accept this explanation in the face of increased violations. New monitoring stations also provided additional evidence of violations. Table 1 depicts the violations recorded between 1973 and 1977.

The 1977 Consistency Statement finally accepted the fact that the air basin was, in fact, violating the federal standards and, even if transport played a part in the problem, the area had a responsibility to clean up its air.

The debate over the role played by transport, however, continues into the present. Everyone concerned agrees that transport is a factor and EPA and ARB have agreed to discount the highest pollutant readings in the basin for that reason. The basic question concerns the role of locally produced pollution. The extent to which it is causing air quality deterioration is still unknown.

In 1977, the focus shifted to determining the exact nature of the pollutant sources and the appropriate strategies for controlling them. Figure 4 depicts the major sources of pollution in the air basin and their estimated emissions in 1977.

TABLE 1

HIGHEST AND SECOND-HIGHEST OXIDANT CONCENTRATIONS

ONE-HOUR AVERAGE
PARTS PER MILLION

LOCATION	1973	1974	1975	1976	1977
Scotts Valley	*	*	*	0.21/0.16	0.10/0.09
Aptos	*	*	*	0.13/0.12	0.12/0.10
Santa Cruz	0.10/0.09	0.09/0.09	0.08/0.07	*	*
Hollister	0.11/0.10	0.11/0.10	0.11/0.11	0.15/0.14	0.14/0.14
Salinas	0.12/0.10	0.10/0.09	0.07/0.06	0.11/0.11	0.08/0.08
Monterey	0.12/0.11	0.11/0.09	0.07/0.06	0.07/0.07	0.07/0.06
Gonzales	0.13/0.12	0.10/0.09	0.10/0.10	0.08/0.08**	0.09/0.09
Carmel Valley	0.10/0.09**	0.10/0.09**	0.09/0/08	0.05/0.05**	*

* No data available

** Full year's data not available

Standards: State 1-hour average = 0.10ppm

National 1-hour average = 0.08ppm

Source: AMBAG - Air Quality Conditions and Trends in Monterey Bay Region.

1977 ESTIMATED EMISSIONS

TOTAL ORGANIC GASES – TONS PER DAY

MONTEREY AND SANTA CRUZ COUNTIES

		Tons
A	On-road vehicles	28.4
B	Off-road vehicles	6.0
C	Petroleum	7.9
D	Organic Solvents	15.3
E	Pesticides	18.0
F	Wood Processing	1.7
G	Waste-Burning	2.2
H	Miscellaneous Area Sources	2.2
I	TOTAL	81.7

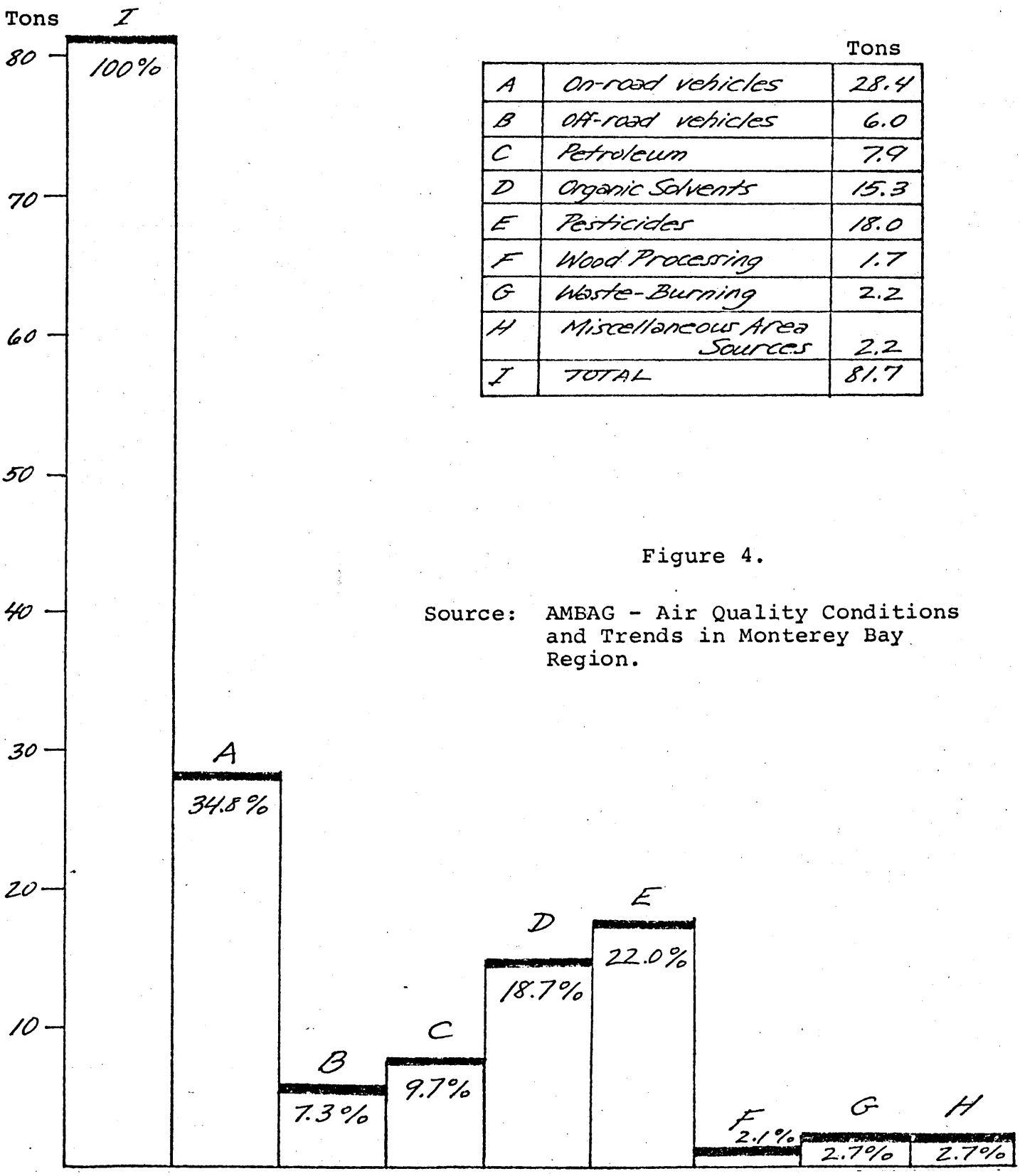


Figure 4.

Source: AMBAG - Air Quality Conditions and Trends in Monterey Bay Region.

While automobiles are the primary polluters, responsible for approximately 35 percent of the emissions, it is interesting that pesticides are second in importance representing 22 percent of the emissions. This is indicative of the importance of agriculture in both Santa Cruz and Monterey Counties.

3. Projected Air Quality Conditions

Estimates of future air quality are based on the projected rate of growth for each category of local emissions and the anticipated impact of external emission control programs. Since future population growth is the driving force behind the expansion of most air pollution activities, the estimated growth rates for emissions in the North Central Coast Air Basin were derived primarily from regional population growth projections. In the case of Santa Cruz County, for example, a moderate growth rate has been projected leading to a population in 1995 of 242,312.

On the other hand, the projected increases in air pollution are substantially mitigated, at least as far as the automobile is concerned, by the estimated impact of State and federal automobile emission standards. Mobile sources will change from being the major cause of the problem to becoming a relatively minor component. Unfortunately, the effect of the federal automobile emission standards may be overestimated. The emission control devices tend to deteriorate and are often not maintained. The switchover to newer cars may not occur as rapidly as anticipated. The automobile companies may not achieve the standards when they are supposed to, although they have promised to meet the deadline. Previously, the impact

of automobile standards has not had nearly as dramatic an effect as expected. The assumption, then, that the emission standards will be achieved could greatly understate not only the future importance of mobile sources in the pollution problem but the total extent of the problem as well. Partially in response to these potential problems, EPA is strongly encouraging and, where an extension to 1987 is requested to meet the standards, requiring, that effective vehicle inspection and maintenance programs be established.

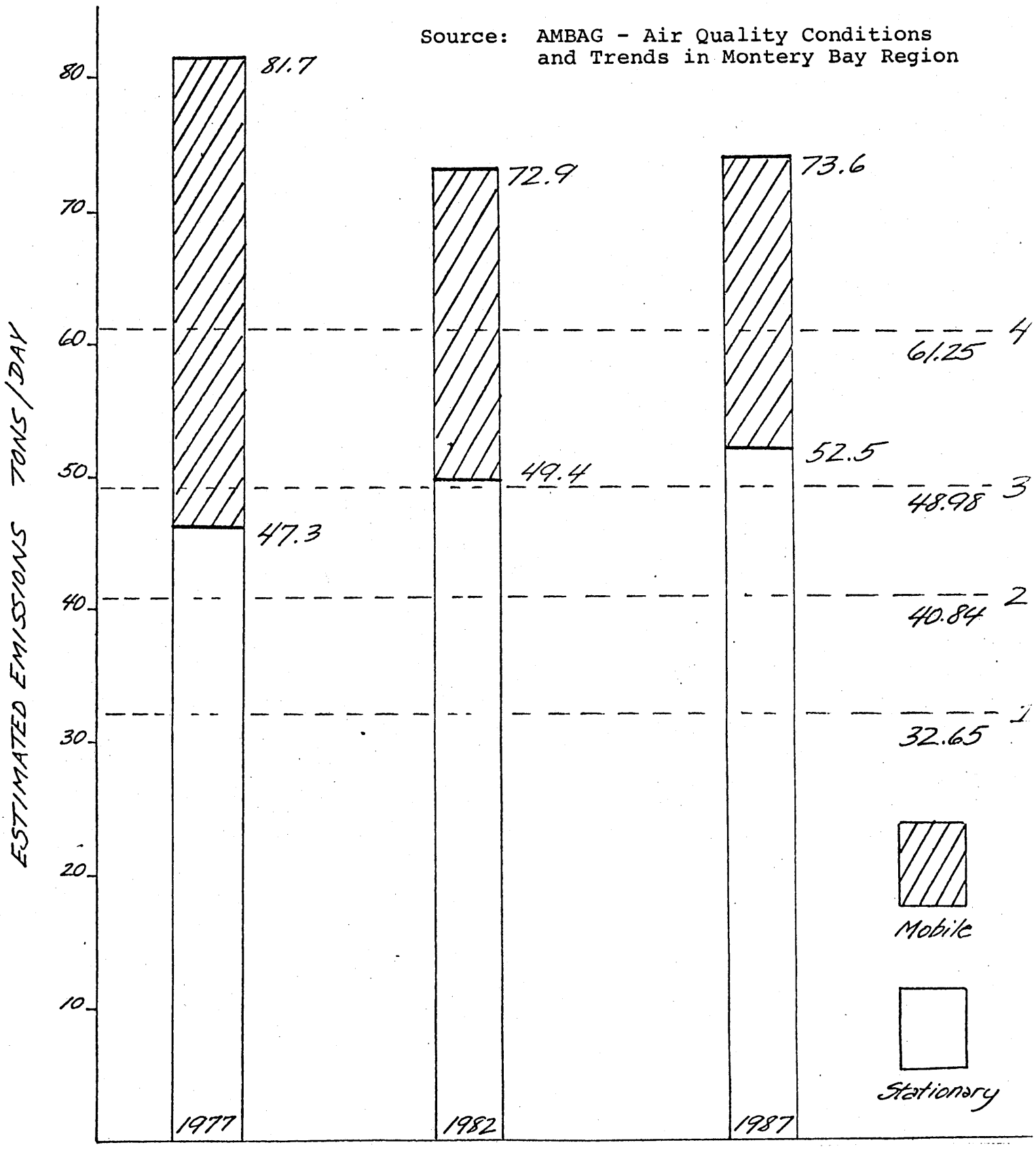
Figure 5 presents the projected pollution levels for stationary and mobile sources in 1982 and 1987. The figure clearly shows the estimated reduction in mobile sources and the resultant reduction of the overall level of pollution emissions. The figure also depicts the level of emission reductions required in order to meet the air quality standards under various assumptions. The controversy over these assumptions will be discussed in the case study in the next chapter on the non-attainment planning process.

In conclusion, then, while the air quality in the Santa Cruz area has not severely deteriorated and undoubtedly transport of polluted air from elsewhere contributes to the problems which do exist, there is still reason for air quality planning and action. Some of the problem undoubtedly derives from local sources and, with the projected growth in population, increased future deterioration is a continuing possibility.

Figure 5.

Case	Oxidant Standard	Second Highest One-Hour Oxidant Concentration	Percent Emission Reduction Required to Achieve Standard
1	0.08 ppm	.14 ppm	60%
2	0.08 ppm	.12 ppm	50%
3	0.10 ppm	.14 ppm	40%
4	0.10 ppm	.12 ppm	25%

Source: AMBAG - Air Quality Conditions and Trends in Montery Bay Region



D. The Actors

This section presents background information on the major actors involved or potentially involved in the planning processes analyzed in the case studies. Table 2 provides a synopsis of this information.

1. Santa Cruz County Board of Supervisors

The Santa Cruz County Board of Supervisors is composed of five representatives. The Supervisors are elected by districts which compose the entire County. While they are expected to represent the interests of their districts on the Board, they are also expected to serve the County as a whole. Supervisors are elected for four year terms and earn approximately $17,000 per year for what is termed a part-time job. The Board meets officially once a week.

The Board administers a budget of approximately $50 million. Approximately 1,300 employees work for the County.

County government is established under State law and most County activities are either specifically authorized or required by the State. Santa Cruz County does not have its own charter. If it did, it would be somewhat more independent of State authority.

The Board of Supervisors has jurisdiction over land use decisions only in the unincorporated area of the County. This includes, however, the vast bulk of the land area and approximately 90,000 of the County's 165,000 population. The Board is responsible for adopting and implementing the County General Plan for this area.

Table II.

Major Actors in Local Land Use Planning Decisions

Actor	No. of Members	Frequency of Meetings	Members Elected*or Appointed	78-79 Budget Approx.	Scope of Jurisdiction	Area of Interest
1. County Board of Supervisors	5	Weekly	Elected	$50 million	Gen.Purpose	Local
1a. County Planning Commission	5	Twice Monthly	Appointed	none	Limited	Local
2. Santa Cruz City Council	7	Twice Monthly	Elected	$18 million	Gen.Purpose	Local
2a. City Planning Commission	7	Twice Monthly	Appointed	none	Limited	Local
2b. General Plan Committee	14	Weekly	Appointed	none	Limited	Local
3. Capitola City Council	5	Twice Monthly	Elected	$1.8 million	Gen.Purpose	Local
Watsonville City Council	7	Twice Monthly	Elected	$12 million	Gen.Purpose	Local
Scotts Valley City Council	5	Twice Monthly	Elected	$1.5 million	Gen.Purpose	Local
4. County Transportation Commission	10	Monthly	Elected	$1.5 million	Limited	Countywide
5. Metropolitan Transit District	11	Monthly	Mixed	$9 million	Limited	Countywide
6. Local Agency Formation Commission	5	Monthly	Mixed	$50,000	Limited	Countywide
7. Special Districts	Varies	Varies	Elected	Varies	Limited	Local
8. Association of Monterey Bay Area Governments	18	Monthly	Elected	$335,000	General	Regional
8a. Air Quality Technical Advisory Committee	Varies	Monthly	Appointed	none	Limited	Regional
9. Monterey Bay Unified Air Pollution Control District	7	Monthly	Elected	$330,000	Limited	Regional
10. Regional Coastal Commission	16	Weekly	Mixed	none	Limited	Regional

*May not be directly elected to agency.

The Board administers a large variety of programs countywide. Many federal and State public health, welfare, employment, and social services programs are provided either directly by the County or through contracts with private agencies.

While this description of County activities is generally correct, there are complex formal and informal interrelationships with other local, State and federal agencies in a number of program areas which make it difficult to determine clear definitions of its authority. It should also be mentioned that one of the chief responsibilities of County Supervisors is to serve on other local and regional bodies.

a. The County Planning Commission

The County Planning Commission is mandated under State law, although its composition is at the discretion of the Board of Supervisors. In Santa Cruz, there are five members on the Planning Commission, each Supervisor appointing one member. The intent of this procedure is to have the Planning Commission accurately reflect the viewpoints on the Board and, as a minimum, cut down on the number of appeals.

Under State law, the Planning Commission is responsible for preparing the County General Plan and recommending it to the Board of Supervisors. The Supervisors are not bound by the Planning Commission recommendations and are the final decision makers.

The Planning Commission also reviews and acts upon a large number of individual development proposals. With certain of

of these, like rezoning applications, State law requires Planning Commission review. For others the process is left to the County's discretion.

While the Planning Commission is the final decision-making authority in a few areas, most of its decisions may be appealed to the Board of Supervisors.

Planning Commissioners serve without pay, although they receive $50 per meeting for expenses. While their regular meetings are twice a month, due to their large agenda, they have been meeting almost weekly.

2. The Santa Cruz City Council

The Santa Cruz City Council is composed of seven members elected at large for four year terms. They receive a minimum stipend amounting to approximately $250 per month. The Council meets regularly twice a month, although it is common for it to meet on a weekly basis, if not even more frequently.

The City of Santa Cruz is governed by a charter which was approved by the City electorate and the State Legislature in 1947. The charter grants a certain degree of independence to the City but many activities are still largely controlled by State law.

As a general purpose local government, the City provides the full range of urban services to its inhabitants. Its total budget is around $20 million.

The City also provides certain urban services to residents of the unincorporated County. About 50 percent of the water consumers served by the City live outside its boundaries.

The City owns and operates the sewer treatment plant which serves the entire north and mid-county area. The City also essentially administers the library system under a City-County agreement in which the County pays most of the costs. These examples indicate the interjurisdictional relationships which exist at the local level as a matter of course. Though at times a source of conflict between the concerned agencies, most of the time a cooperative attitude prevails.

Like County Supervisors, City Council members spend much of their time serving on other local and regional agencies.

a. City Planning Commission

The seven members of the City Planning Commission are appointed at large by the City Council for four year terms. They meet twice monthly and receive no pay.

They have the state mandated responsibility, as with the County Planning Commission, for developing and recommending the General Plan. Traditionally, the City Planning Commission was involved in the review of a large number of development applications. As a result of the workload as well as the need to concentrate on the General Plan's revision, the City Council created a Zoning Board composed of three Planning Commissioners and two others appointed by the Council to hear most of the development applications. Under State law, the Planning Commission must still consider certain types of items.

b. General Plan Committee

The General Plan Committee was established solely for the purpose of drafting a recommended revision to the City's General

Plan. The Committee was composed of 14 members, with each City Council member appointing two.

The activity of the Committee will be discussed in the case study on the General Plan revision.

3. Cities of Capitola, Scotts Valley and Watsonville

Capitola is located in the mid-County area and has a population of approximately 8,580. Scotts Valley, the most recently incorporated City in the County, is located in the Santa Cruz Mountains along Highway 17 and has a population of 6,425. Watsonville is located in the agricultural South County and is the traditional center of the County's agricultural industry. It is the fastest growing City in the County and has a population of 20,540.

All three cities are established under charter but only Watsonville provides the full range of urban services. Scotts Valley and Capitola residents still receive certain services, like fire and water, from special districts.

4. Santa Cruz County Transportation Commission

The Santa Cruz County Transportation Commission was established under the provisions of the California Transportation Development Act of 1971. The Commission was established by joint action of the Board of Supervisors and the cities of the County. The Commission has a membership of ten:

- three appointed by the Board of Supervisors;
- three appointed by the Mayors Select Committee (composed of the Mayors of the four cities whose only formal function is to appoint city representatives to various

agencies as required by State law);

- three appointed by the Santa Cruz Metropolitan Transit District;
- one appointed by the Board of Supervisors to represent other transit operators in the County (traditionally a fourth County Supervisor is appointed).

The Transportation Commission serves two legislative functions. The first is to distribute State funds for non-automobile oriented transportation projects in the County. The second is as the Regional Transportation Planning Agency primarily responsible for preparing, adopting and updating of the Regional Transportation Plan (RTP). The projects approved by the Commission must be consistent with the RTP.

The Commission's annual budget is approximately $1.5 million and, traditionally, the bulk of the money has gone to the Transit District with the remainder distributed to local agencies on the basis of population.

Most of the funds are granted on the basis of requests received from member agencies. The policies adopted by the Commission, likewise, depend on the approval of local agencies for implementation. The Commission, then, though independent and composed of members, at times, not in philosophical agreement with the majority of their appointing bodies, tends to make decisions most likely to be acceptable to the local governments represented. Compromises in policy and funding decisions are often made in order to avoid inter-agency conflict.

While the staff to the Transportation Commission is paid

out of the Commission's budget, they are located in the County's Community Resources Agency (Planning, Parks, and Watershed Departments) and are under the control of the County's Community Resources Agency Director. In most cases of potential conflict, Commission staff will meet with staff from the member agencies in order to resolve the issue prior to its coming before the Commission.

5. Santa Cruz Metropolitan Transit District

The Transit District, a separate public entity, provides the only public mass transit facilities within the County. The District is governed by an eleven member board of directors composed of three members appointed by the Santa Cruz City Council, five members appointed by the Board of Supervisors, and three other City members, one each appointed by the City of Capitola, the City of Scotts Valley and the City of Watsonville.

The Board of Supervisors and City Councils are not required to appoint members to the Transit District from their own membership and, in fact, often do not. Only two Supervisors, for example, serve on the Transit District. The other three appointees are private citizens. As the District has grown and become more powerful, the tendency to appoint public officials has increased. At the same time, there remains a strong desire to continue citizen involvement. The policy on appointments varies from agency to agency.

Beginning in January 1979, the Transit District will receive one-half of one percent of the Sales Tax revenue

collected in the County as a result of a successful ballot election in June 1978. It is estimated that this will generate $4 million in revenue annually. The total 78/79 budget for the District is $9 million, which includes $2 million in estimated Sales Tax revenue for six months.

The District has a fleet of 42 buses, with 23 more on order and 13 more out to bid. It is currently in the process of expanding service Countywide. Students and the elderly, the transit dependent, still account for the vast majority of the ridership.

6. Local Agency Formation Commission (LAFCO)

Though not directly involved in any of the planning processes considered in the case studies, LAFCO plays an important role in the development of the County and the local intergovernmental relationships, and deserves mention.

LAFCOs were created under State law in the 1960s to bring some order and rationality to the annexation and incorporation process. Previously, cities, for example, would only annex those parts of adjacent land that offered financial benefits. Property owners, also, would only seek annexation to the city that offered them the best deal. The result of this system was a hodgepodge of jurisdictional boundaries which confused the public, made the provision of public services difficult and expensive, and undercut the ability for planning to occur at all.

LAFCOs were given the authority to approve all annexation and incorporation requests. They were also directed to develop

guidelines which would guide development in a rational manner and create logical boundaries for the local jurisdictions.

The Santa Cruz County LAFCO is composed of two members of the Board of Supervisors, two City Council members appointed by the Mayors Select Committee and one public member appointed by the other four. The City representatives rotate on a yearly basis while the County appointees serve at the pleasure of the Board of Supervisors. The public member, though appointed for a four year term, can legally be removed at any time.

LAFCO, unfortunately, has not achieved the objectives set for it. While annexation decisions are probably made more rationally than occurred in the days before its existence, the guidelines governing LAFCO's decisions are notoriously loose and jurisdictional boundaries are still extremely illogical. Part of the problem has been that most annexation decisions are made to facilitate growth or lead to the financial gain of some party. The public officials elected to city and county government have often supported these interests and approved their requests. Further, the spirit of you scratch my back and I'll scratch yours tends to dominate.

LAFCOs, then, while not directly involved, can have a strong influence on whether local general plans or the land use components of air quality plans will ever be carried out, especially in those situations where there is disagreement between local agencies regarding the plan policies.

7. Special Districts

A large number of special districts exist in Santa Cruz County, many of which provide basic public services to local

residents. The most important of these are the public school, water and fire districts. Each district has its own elected board of directors, budget, and tax base. There are, for example, 15 independent fire districts and 13 school districts.

While the boundaries of special districts usually do not overlap with others providing the same function, there is tremendous overlap between the various types of districts. For example, one resident may be in a school district and a fire district. Another resident a block away might be in the same school district, a different fire district and a water district.

Although this system of special districts creates a good deal of confusion on the part of the public regarding how services are provided and results in low voter turnout at elections of the various district directors, it does provide flexibility in responding to local needs. It also appears to have significant public support since any attempt to eliminate or consolidate the various districts leads to an immediate public outcry.

While each district is independent, there is significant cooperation between them. The Santa Cruz Fire Chiefs Association, for example, is composed of representatives from all the County fire agencies and meets regularly. The major water districts are currently planning to install inter-ties between their systems.

It is not possible to describe the full complement of public and private special districts here. In the main, they tend to confuse local government as well as constrain the

power of general purpose local government, where they coexist. On the other hand, they provide specialized services in a visible manner. They have been included here to illustrate the rich fabric in which local government is interwoven.

8. Association of Monterey Bay Area Governments (AMBAG)

The Association of Monterey Bay Area Governments (AMBAG) is a voluntary governmental organization that was established with the signing of a Joint Powers Agreement on January 8, 1968.

Membership is open to the two counties of the region, Monterey and Santa Cruz, and all incorporated cities within the region. The membership at the present time is 18, and represents both counties and 16 cities. Santa Cruz has five representatives: the County and four cities.

As the area's Council of Governments (COG), AMBAG serves as the region's A-95 clearinghouse. It also has received substantial federal funding for a variety of planning and coordination activities. AMBAG was designated the lead agency and received approximately $825,000 over three years to undertake a regional water quality planning effort under the federal 208 water quality program. AMBAG has also received HUD 701 funds for the preparation of a comprehensive regional land use plan and housing element.

The receipt of outside sources of funds, however, has not made AMBAG independent. Ultimately, it is sustained by the payment of dues from member agencies. Out of a total estimated 1978/79 budget of $334,000, approximately $90,000 is provided by member agencies. A local government dissatisfied

with AMBAG's performance can refuse to pay its dues or simply withdraw its membership, as a few have done. While some State and federal pressure can be put on local governments to prevent this, AMBAG can also lose its legitimacy if too many local governments withdraw. Finally, the agency is governed by a board of directors composed solely of local officials. Irrespective of the sympathies of staff, they must respond to their directors. For these reasons, AMBAG functions more as a local agency than as a regional agency in any real sense.

The local representatives appointed to AMBAG tend to retain their local perspective and serve their local interests, rather than adopting a regional outlook. In many respects, AMBAG provides an opportunity for increased local cooperation and a more unified local stance in response to State or federal demands. As with the Transportation Commission, the general attitude of the membership serves to avoid conflict with each other.

The function of AMBAG will be considered at greater length in the case study on the non-attainment plan.

a. Air Quality Technical Advisory Committee (TAC)

The Air Quality TAC is, in fact, a staff advisory group to the AMBAG Board of Directors established to assist with the preparation of the non-attainment plan. It is composed of staff from all the member agencies, the regional air pollution control district and local industries. Representatives from the ARB and EPA usually attend the TAC meetings.

The TAC plays an important role not only as advisors to

the AMBAG staff and Board of Directors but, also, as advisors to their own City Councils or Boards of Supervisors. They can provide direct feedback to AMBAG staff regarding local concerns. On the other hand, AMBAG staff hopes that by participating in the process, they will buy into the results. The TAC members are aware of this and are usually cautious in their commitments, if they make any at all. They certainly never commit their governing bodies.

TAC meetings are important in the planning process, however, because they provide necessary input to AMBAG staff. The proposed elements of the plan probably receive their most serious review by the TAC members. Also, TAC meetings provide the opportunity for local staff to meet directly with State and federal staff. Clarifications of policy can be presented, differences of opinion discussed, and proposed alternatives argued out. While a good deal of tension existed in the non-attainment planning process between the ARB and EPA staff on the one hand and the AMBAG and local staff on the other, the TAC meetings, at least, continued the dialogue.

9. Monterey Bay Unified Air Pollution Control District (MBUAPCD)

The MBUAPCD was established under State law in the late 1960s and includes Santa Cruz, Monterey and San Benito Counties. State law, at the time, permitted counties to establish their own air pollution control districts, although unified districts were encouraged. The establishment of the MBUAPCD was considered a positive accomplishment by State and federal officials.

The MBUAPCD Board of Directors is composed of seven members, two Supervisors appointed by Santa Cruz County, one by San Benito County, and four by Monterey County. The District also has an advisory council composed of 15 citizen members and a hearing board of three citizen members.

The MBUAPCD is primarily concerned with the control of stationary sources of air pollution in the region. It has promulgated a number of regulations for both existing and new sources. To a large extent, the District's operations are governed by both federal and State law.

Although the District does receive revenue from each member county, this has become almost nonexistent this year as the various fees charged to the region's polluters were raised significantly. Much of the District's budget derives from State and federal grants.

In addition to the regulation of individual polluters, the MBUAPCD is responsible with AMBAG and the Transportation Commissions for the preparation of the non-attainment plan. Its focus is on the role of stationary sources and the requisite control strategies for them.

10. The Coastal Commission

While the Central Coast Regional Coastal Commission did not play a direct part in any way in the planning decision processes considered in the case studies, it is an extremely important part of the local planning context.

In 1972, California voters approved Proposition 20, the Coastal Initiative. This law designated a coastal zone generally

1,000 yards from the coastline, established a State Coastal Commission and six regional commissions, required that every development proposal in the coastal zone receive a special coastal permit which could only be granted if it met the conditions of the Act, and mandated a planning process to produce a coastal plan by 1976. The Legislature was directed to adopt a coastal plan and the provisions of the Initiative were to expire on January 1, 1977.

The Coastal Initiative had a tremendous effect on the development process in the coastal zone and the operation of local government. Despite criticism of the Act and its implementation, a Coastal Plan was produced by the Coastal Commission on time and a compromise coastal act was adopted by the Legislature.

Under this Coastal Act, coastal commissions are still responsible for granting development permits within the coastal zone. However, over the next few years local governments in cooperation with the coastal commissions are mandated to develop local coastal programs (LCPs), which are to be precise plans to guide future development in the coastal zone. Once the Coastal Commission approves the LCPs, permit authority reverts back to local governments except for appeals in certain cases and it is expected that the regional commissions will be eliminated.

At the present time, then, both Santa Cruz City and County are in the process of preparing their LCPs. While the purposes of the Coastal Act are to protect coastal resources, and clean

air can be considered an important resource of the coastal zone, the coastal commissions do not appear to have expressed much concern for air quality considerations in the LCPs. The priority of other issues may be the cause of this. Certainly the LCPs will have air quality impacts.

The coastal legislation is interesting particularly since it established a truly regional agency with substantial independent power. The Central Coastal Regional Commission has jurisdiction over San Mateo, Santa Cruz, and Monterey counties and consists of the following members:

- One supervisor and city council member from each county;
- One delegate of the Association of Bay Area Governments;
- One delegate of the Association of Monterey Bay Area Governments;
- Eight members of the public, two appointed by the Governor, three appointed by the Speaker of the State Assembly and three appointed by the State Senate Rules Committee.

The State Commission consists of three members of the Governor's cabinet, six members of the public, and six representatives of the regional commissions. Decisions of the regional commissions can be appealed to the State Commission for a final decision and the LCPs must be approved by the State Commission.

The Coastal Commissions initially generated criticism from property owners and local governments because of their permit granting authority. Although local governments still

criticize the coastal commissions at times because of particular decisions or policies, open hostility has largely passed and relationships on the staff level, where they mostly exist, are generally cooperative. Local governments realize that, at times, the coastal commissions perform a valuable function. Undesirable projects in the coastal area which the city or county may be pressured into approving despite public opposition are quite likely to be turned down by the coastal commission. The developer, then, vents his anger at the coastal commission and the opponents are appeased.

Another factor causing the current period of relatively good relations is the fact that the coastal commissions have granted funds to the local governments to prepare their LCPs. Since the localities also hope that their proposed LCPs will be approved, there's a double incentive to cooperate. When the time comes for the coastal commissions to finally approve the LCPs, conditions could quickly change.

Local general plans, under the Coastal Act are required to be consistent with the LCP and, in fact, the LCP can be seen as an element of the general plan. In the City of Santa Cruz and Live Oak, where a portion of the area is within the coastal zone, the general planning process is of direct interest to the coastal commission.

E. Conclusion

The context in which local government functions is extremely complex. Local government officials must respond, primarily, to the demands originating in their area's historical,

social and economic milieu. They must additionally respond to the requirements imposed by State and federal governments. In California, particularly, the State has mandated a variety of land use planning procedures. Although local government controls the content of the required plans to a large extent and retains wide discretion over individual land use development decisions, in a number of areas, State demands have either substantially restricted or directed their decisions.

The local government context is also complicated by the intricacy of intergovernmental relations. Local officials serve on a number of semi-autonomous agencies each with their own charge and powers. Local officials must also interact with a large number of independent, special interest districts which wield significant power within their area of concern.

In general, local governing bodies are, by nature and preference, reactive. Requests come to them or demands are made on them. Public officials usually do not introduce policies or programs independently. By and large they depend on their staff or members of the public to bring matters to their attention. Especially since they serve on so many policy making bodies, they tend to give a great many issues a relatively small amount of attention relying on staff to work out the details. They do, however, have their political positions and seek insofar as possible to have them implemented. They, therefore, will attempt to mold policies and programs brought before them to reflect their views. In this regard, they are very familiar with techniques for responding to

attempts by other agencies to influence their decisions. They are also experienced with the mechanisms for resisting unwanted intrusions and widening their own influence. At times the intricacies of public life will lead them to approve a policy while serving on one public body, like AMBAG, with the full intention not to implement it when sitting on another public body, their City Council. The 30 percent transit policy seems to be an example of this.

The reliance of local government officials on their staff for making the necessary information available to them is a source of difficulties at times. Not only do the staff of the different agencies on which the public official serves at times have conflicting views, but it is not unusual for the staff within an agency to disagree. Two departments within the County, for example, can have opposite opinions regarding the desirability of new road construction. While local officials usually seek to minimize staff conflict and, over the long run, develop a staff which reflects their positions, this does not always occur and adds to the complexity of local decision making. For its part, staff also seeks to avoid conflict among its governing body and frequently anticipates its response.

Finally, the air quality problem in Santa Cruz, as elsewhere, is complicated. Two general problems exist. One results from the perception that with rapid, increased growth, air quality will deteriorate and something must be done about it. Second, while it is generally agreed that at least some

of the area's air quality problem is due to transport from other air basins, the extent of the problem is not known and the local responsibility is debatable.

The next chapter will analyze the effects of the federal air quality program on four local planning decision processes in Santa Cruz County.

THE LOCAL SETTING

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V.

THE CASE STUDIES

In this chapter, the case study approach will be utilized to analyze in some depth the effect of the federal air quality program on local land use planning decisions in Santa Cruz, California. The "null hypothesis" of the thesis, discussed in the first chapter (i.e., that there has not been an effect), will be "tested" by means of an examination of four local plans and the processes by which they were prepared. The objective is to see whether in one urbanizing area with deteriorating air quality the federal concern is bearing fruit and, if it is, to investigate the extent and manner with which the concern has been manifested, the character of the local response, and the ways the complexities of the problem have affected the outcome.

A. Sample Surveys of the Local Air Quality-Land Use Relationship

Before beginning the analysis of the specific Santa Cruz plans, a review of a few general sample surveys concerning the incorporation of air quality concerns into the local planning process will be presented in order to provide a comparative and historical context for looking at the situation in Santa Cruz. As far as can be determined, only one detailed analysis of a local land use plan in terms of its concern with air quality has been carried out and that was done in the early

nineteen seventies before the effects of the 1970 Clean Air Act Amendments could be measured.[1] This study found no conscious concern with air quality factors, though the plan, if implemented, would have, in the authors' view, significantly increased air pollution. The lack of other detailed analyses required the use of existing sample surveys for comparison purposes.

Three surveys conducted in the early and mid-nineteen seventies were reviewed. The first, described by Kaiser, et al. in Promoting Environmental Quality Through Urban Planning and Control, was not directly interested in air quality but does offer relevant insights on the local perception of environmental issues and the expansion of federal influence in the early nineteen seventies.[2] Conducted in 1972 the study found that the federal air quality regulations were perceived as having only a very minimal effect on local government. NEPA, HUD programs and the A-95 review process were all considered as much more important.[3] In addition, the survey indicated that although local agencies tended to identify themselves as the lead actors in pursuing environmental quality and the planning process as the major mechanism for doing so, they did not appear to have integrated even general environmental concerns into their local planning activities in a meaningful way.[4]

The second study, conducted in 1973 by the Argonne National Laboratory in cooperation with the American Society of Planning Officials, stemmed from the conviction that planning

agencies must make air pollution control a part of their work program and sought to determine what planners were doing to support air quality control.[5] The survey found that a minority of planning agencies specifically considered air quality in land use and transportation planning, and even fewer considered it in other functional areas. On the other hand, planning agencies indicated a desire to be involved in air quality management, although the level of political support for this was questionable. This study, financed and published by EPA, is evidence of the federal concern with the air quality-land use relationship and of an attempt to expand its influence by providing information on the status of the incorporation of air quality concerns into local planning processes in a context which supported such incorporation.

Finally, in 1974 the California Air Resources Board (ARB) carried out a survey of local and regional agencies in order to evaluate the status of air quality considerations in the ongoing local planning process.[6] The ARB study found that, while the number of California agencies incorporating air quality considerations in the local planning process had increased, a large number of agencies had not yet done so. Moreover, even for those incorporating air quality concerns, the level of consideration was minimal. The awareness by California local agencies of the air quality-land use relationship was probably growing and, as elsewhere, they wanted to stay involved with it, even though it was not a high priority.

These surveys, though providing only limited information,

are relevant here for the following reasons. First, by indicating a minimal federal influence they validate the use of a "null hypothesis" exploratory approach in the case studies. Second, the generalized responses to survey questions by planning agencies signals certain analytic weaknesses that perhaps a case study approach can overcome.

B. The Case Studies

The federal effect on local land use planning decisions will be examined in case studies of the following planning decision processes:

- The City of Santa Cruz General Plan Revision
- The Live Oak Area Plan
- The Air Quality Element of the Santa Cruz County Regional Transportation Plan
- The Monterey Bay Regional Non-Attainment Plan

1. General Comments

The case studies consider two kinds of plans. Both the City of Santa Cruz General Plan Revision and the Live Oak Area Plan are traditional local general plans with strong land use components. They will be examined from the perspective of their incorporation of air quality considerations. The Air Quality Element and the Non-Attainment Plan are both air quality management plans. They will be explored from the perspective of their incorporation of land use considerations.

The case studies, then, offer the opportunity to compare the effects of the federal air quality concerns on local planning and the air quality-land use relationship from two

somewhat different perspectives. A consideration of these two points of view should help illuminate the nature of the federal impact on the local planning process. The different perspectives can be depicted in the following manner:

		Assume: Land Use Concern	Assume: Air Quality Concern
Examine	Land Use Concern		Air Quality Element Non-Attainment Plan
Examine	Air Quality Concern	Live Oak Area Plan Santa Cruz General Plan Revision	

There is a second important difference between the plans. Both the Live Oak Area Plan and the Air Quality Element have been finally adopted and the processes are completed. The City of Santa Cruz General Plan Revision and the Non-Attainment Plan are still in process. They are both well along in their preparation and review, and provide a good deal of information relevant to this investigation. Also, the fact that two of the plans are not yet adopted may provide an opportunity to better appreciate the ways in which air quality concerns are or are not incorporated in the planning process. This is because it has been possible to question some of the actors before the fact, as it were, rather than after.

It is important, also, to mention the rationale for selecting these four planning processes for investigation. First of all, they permit an examination of the federal influence and the air quality-land use relationship from a number of perspectives. The air quality plan-general plan distinction was mentioned above. Also of importance, each plan was prepared by a different jurisdiction--a city government; a county government; an agency composed of representatives from the cities, the county, and the transit district; and a regional agency governed by city and county representatives. Since the goal here is not to measure quantitative differences but to explore the intergovernmental relationships between the federal and local levels, this mix seems desirable.

Second, all four plans were prepared or are being prepared at about the same time. They are the most recent plans of the agencies involved and, therefore, any impacts of the federal air quality program should be manifested in them.

One complicating factor is that the federal law changed significantly during the planning process of the two general plans. While this confuses the analysis somewhat, it may also provide the opportunity for some useful insights.

Third, the four cases were selected in part because of the author's personal familiarity with each of them upon which first hand observations could be based.

Finally, given the fact that California has in many ways led the nation in terms of air quality concerns, it is likely that if federal influence is not evident there, it will not

be found anywhere.

2. Methodology

a. Introduction

According to Forcese and Richer, the essential feature of a case study is that the unit of analysis is "studied intensively as an entity."[7] The emphasis, then, is on understanding the complexity of the whole, rather than on precisely measuring the parts. In the area of public policy implementation, particularly, it is necessary to rely on qualitative as opposed to quantitative methods.

Further, because the case study deals with one situation in depth, it is not possible to readily generalize it to other contexts. On the other hand, it should not be a study of the unique. By asking the right questions, comparing case studies with one another and analyzing the definition and application of the factors considered, it may be possible to utilize the case study so as to generally broaden knowledge of the phenomena being investigated.

b. Sources

Three sources were utilized for gathering information on the four case studies. Documents were the major source. Minutes of meetings, staff reports, newspaper articles, preliminary planning studies, and the plans themselves were all reviewed. Every official document which could be identified as potentially relevant to the particular planning process was examined.

The second source of information was interviews. Question-

naires were prepared and administered to participants in the process--staff members and decision-makers. The same questions were asked of all the decision-makers and of all the staff members, though a somewhat different questionnaire was administered to each group (see Appendix A for the questionnaire forms). Almost all the questions were open-ended and a number were attitudinal. In most cases, one staff member and one or two decision-makers were interviewed. In all, nine interviews were conducted. The intention of the interviews was to provide a deeper understanding of the factors involved in the planning process, not to quantify individual perceptions or differences. The interviews were conducted in August and September 1978 and took place at about the same time the documents were being reviewed. While a greater number of interviews might have been desirable, time limitations made this impossible. Those selected were felt to be either generally representative of the majority on the decision-making body or the main staff member who worked on the air quality-land use issue.

A final data source was first hand observation. As an aide to a County Supervisor, an alternate member of the County Transportation Commission and a member of the City's Housing Advisory Committee the author, to some extent, was involved in the preparation of the four plans. With the Live Oak Area Plan and the Santa Cruz General Plan Revision it was primarily as a close-at-hand observer. With the Air Quality Element and the Non-Attainment Plan it was as an active participant as well as an observer.

While a sincere attempt has been made to remain objective, undoubtedly certain biases will be reflected in the analysis to some degree and the reader should be aware of this problem. There is always a possible pitfall when the observer participates in the process and cares about the outcome. In order to mitigate this problem the case study materials are first presented in a straightforward manner, without commentary, and all relevant information is described in order that the reader may decide whether the interpretations are justified by the data. An additional possible pitfall stemming from the author's participation in the planning processes is that important information may be missed as a result of a too close proximity to the day to day activities. This is the problem of overlooking the forest through an over-involvement with the trees. The studies undertaken in the earlier chapters were done, in part, to avoid this problem. Finally, the fact that the interviewees knew the author and had related to him in a number of ways outside of the study undoubtedly colored their responses. It is unclear, however, whether this is an advantage or a disadvantage since they may have been more willing to be frank with someone known to them than to a stranger. Personal involvement in the processes also has a number of advantages, not the least of which is the ability to evaluate available information in terms of its likely significance in the process.

c. Indicators of Federal Influence

The major thrust of the analysis is to measure the extent

of the federal influence on the local land use planning processes. Other aspects of federal influence, such as its forms and channels, are also considered.

Three general measures of federal influence have been identified. Although their application differs somewhat between the general plans and the air quality plans, taken as a whole they provide indications of possible federal presence on the local level from a number of perspectives. The three measures will first be described in a general manner in order to inform and help the reader organize the discussion of the relevant case study materials which follows. Finally, the evidence from the case studies will be evaluated in terms of the measures.

The three measures are the following:

1) Indicators of direct federal influence;
2) Indicators of the presence of the air quality-land use relationship;
3) Specific land use measures affecting air quality.

1) Indicators of direct federal influence

The evidence of direct federal influence will differ between the two types of plans. With the general plans, since there is no requirement that the federal air quality program be addressed in them, any specific mention of the federal air quality program will provide evidence of federal influence. The extent of influence can vary from a passing reference on federal air quality standards to an explicit program to implement the federal land use concern.

For the air quality plans, since they are mandated by federal action, the specific consideration of the federal concern with the air quality-land use relationship in the plan will be taken to indicate federal influence. The evidence of federal influence can vary from the brief mention of the federal interest to the advocacy of a set of land use control measures to be adopted by local governments explicitly designed to respond to the federal concern with relating air quality and land use.

The key, with this indicator, is the plan's explicit awareness and inclusion of the federal concerns.

2) Indicators of the presence of the air quality-land use relationship

The inclusion of the air quality-land use relationship in the four planning processes is taken to be an important indicator of potential federal influence for several reasons. As mentioned in previous chapters, to a large extent the awareness of the relationship is due to federal activity. The federal government financed most of the major studies to explore the relationship and has published much of the written material on it. Further, the federal government has attempted, through various means, to encourage localities to include the relationship in their planning efforts. At times, for example, with indirect source review, the federal government even sought to require this. Finally, to a limited extent, land use measures to improve air quality are still a federally required part of an area's air quality effort if only in the analysis. The

federal air quality program, then, has inspired and publicly advocated the consideration of the air quality-land use relationship. To the extent that local plans include it, there is a likelihood that the federal program was involved.

On the other hand, it must be recognized that to some extent, other agencies have also recognized the connection between air quality and land use. Planners have identified and studied the relationship for many years. Certain governmental agencies have also considered it. The State of California, in particular, has encouraged the inclusion of air quality concerns in the local planning process. Unfortunately, it is not possible to determine the federal influence on the State program. It is also difficult to determine the relative impacts of the federal and State programs and independent research on the local consideration of the air quality-land use relationship. Recognizing the possible problems with tying the air quality-land use relationship to federal influence, it still appears justified for this analysis.

The following are specific indicators identified under this heading relating to different aspects of the planning process.

a) <u>The plan contains some consideration of air quality-land use concerns</u>

In a sense, this indicator identifies the minimal degree of federal concern and is really a catch-all category. Its inclusion is designed to insure that if any indication of incorporation of the air quality-land use relationship occurs

in the plans, even if it doesn't fall under the other more specific categories, it will be contained in the analysis.

This indicator can vary from the briefest mention of the relationship to a full scale technical analysis with simulation models and precise land use control measures. This indicator gauges the general breadth and depth of the air quality-land use relationship's inclusion.

b) The plan contains specific air quality-land use goals, policies or programs

This indicator concerns any goals, policies or programs in the plans which explicitly link land use and air quality. To some extent, even the simple inclusion of an air quality policy in a general plan or a land use policy in an air quality plan would be relevant here, as it could indicate some degree of awareness of the air quality-land use connection.

The indicator can vary from the inclusion of an extremely general goal statement to a specific policy directly relating air quality and land use concerns.

With this indicator it is possible, also, to identify attempts by local government to resist federal influence. The inclusion of no more than extremely general goals or policies, for example, with little chance of implementation may indicate a desire to circumvent a serious consideration of the air quality-land use relationship by merely paying lip service to it.

c) The plan contains a technical analysis of the air quality-land use relationship

This could range from a simple rollback equation to a

complex simulation model. Utilization of emissions data and the evaluation of alternative plans in terms of their air quality impacts would be considered here. For air quality plans, the technical analysis would have to specifically include land use factors.

The strong presence of this indicator signals that the air quality-land use relationship has been incorporated in the planning process in such a way as to probably have a meaningful effect. This is because a detailed analysis can more precisely reveal the actual nature of the relationship and, thereby, provide a basis for deciding between alternative programs and plans.

d) Air quality-land use concerns were discussed publicly as part of the planning process

With this indicator, the analysis moves from the plan documents to the planning process itself. This indicator can vary from little or no mention of the air quality-land use relationship or, with general plans, the air quality effects of the plan, to the domination by this issue of the public discussion of the plan. Both the nature of the discussion as well as the amount of it are relevant here.

e) Decision-makers direct their staff to include or delete air quality-land use considerations during the planning process

This indicator explores the relations between the staff and the decision-makers. With this indicator, the extent to which the staff initially proposed the incorporation of the air

quality-land use relationship in the proposed plan must be reviewed first. The indicator itself could vary from decision-makers exerting little or no effort to add or delete air quality or land use concerns from the plan to the decision-makers requiring major revisions in the staff recommendations. Serious attempts by decision-makers to remove air quality-land use concerns could indicate a local resistance to the perceived expansion of federal influence.

This indicator is related to the previous one since discussions of the air quality-land use concerns are not very meaningful if action is not taken in terms of the plan.

f) <u>The staff of the planning agency is knowledgeable about the air quality-land use relationship</u>

The level of staff knowledge can be a major indicator of federal influence on the local planning process, since staff prepares the plan drafts and provides the decision-makers with much of their information. The consideration of staff knowledge of the air quality-land use relationship has two components. One concerns the level of knowledge and the other concerns staff's interpretation of it and willingness to utilize it. The indicator can vary from little awareness of the information on the relationship and/or little desire to use it to a detailed understanding of it, including the capability to perform a sophisticated technical analysis, combined with the conviction that it is important.

g) The local agency allocated its own funds to study the air quality-land use relationship

Since a financial investment usually signifies a serious interest, this indicator could provide strong evidence of a real local involvement with the air quality-land use consideration. The concern here is with local funds spent directly on the analysis of the air quality-land use relationship or on the potential impacts of air quality-land use measures contained in the plans. This indicator can vary from little or no commitment of local funds to the allocation of substantial amounts of money.

3) Specific Land use measures affecting air quality

This indicator relates back directly to the previous chapter on the nature of the air quality-land use relationship. In that chapter various land use strategies and techniques affecting air quality were described. With this indicator, the four plans will first be examined to see if certain of those land use measures are included. If they are, it will then be necessary to determine whether their inclusion is connected with a meaningful concern for air quality improvement.

For general plans, the presence of specific land use measures which affect air quality will be analyzed to see whether and to what extent a concern with air quality was a motive for including them. If air quality is found to be a motive, it will be considered an indication of indirect federal influence on the planning process. For air quality plans, the fact that specific land use measures are contained in the plans

is taken as indicative of a federal influence since air quality concerns would obviously have motivated their inclusion; however, if the programs are too general, they may only indicate a desire to avoid federal influence and the key is whether they are likely to be implemented.

The following land use programs, taken from Chapter II, will be considered:

- Compact urban development
- High density development along transit corridors
- Mixed uses
- Population growth limits
- Concentrated commercial development
- Restriction on infrastructure extensions
- Relating residential development permitted to projections of local employment
- Emission density zoning.

d. Mode of Analysis

Each case study will be presented in the following manner:

- a general description of the planning process
- a brief discussion of some of the major issues dealt with in each plan
- a detailed examination of the documents and statements composing the planning process for evidence of land use and air quality considerations
- a brief summary of the findings

In describing the specific documents and statements from each planning process, only those aspects directly related to

the relevant federal, air quality and land use concerns will be included. This procedure may create a slightly skewed impression of the major emphases of the plans but it is intended that the other parts of the analysis will put the air quality-land use issues in their proper perspective.

3. The City of Santa Cruz General Plan Revision

a. Brief Description of the Planning Process

The City's current general plan was adopted in 1964 and provided for substantial growth in the City to 1994. Serious concern with the 1964 General Plan emerged in the early nineteen seventies. The City Council at that time established a large citizens committee and in 1971 adopted a general plan program entitled A Policy Basis of the Planning Program.[8] This was composed of a long list of policies, often contradictory, covering every conceivable area of city activity. The Policy Basis did not resolve the issues of concern even on the policy level and also did not affect the 1964 General Plan land use map.

In early 1973, then, the City Council met with the Planning Commission to discuss revising the general plan. Little progress was made, however, over the following months. After a change in the Planning Director, the City Council again met with the Planning Commission in late 1975 and approved a process for the general plan revision. Soon after, the Council established a General Plan Committee to develop and recommend a plan. The Council also made preparation of the plan the highest priority within the Planning Department's work program.

The General Plan Committee first identified important issues to be considered, dubbed "critical factors," and released a report describing these issues in August of 1976. A detailed projection of current trends was then provided by the staff and released in October 1976. This was called the "base case." Using this base case, three alternative general plans for development to 1990 were prepared, distinguished primarily by a different population growth projection. There was a low growth, moderate growth and high growth option.

At various points in the process, the General Plan Committee held public meetings and the public was regularly encouraged to attend their regular meetings. Public attendance, however, was generally low.

In late 1977, the General Plan Committee completed its work and, on a split vote, recommended the moderate growth alternative. The proposed general plan revision then went to the City Planning Commission. After a series of study sessions and public hearings, one of which was well attended and marked by controversy, the Planning Commission, in April 1978, also recommended the moderate growth alternative to the City Council.

The proposed general plan subsequently came before the City Council for review. The Council, after expressing its concerns, referred the proposed plan back to the Planning Commission, which is now considering the Council comments. An Environmental Impact Report (EIR) is also being prepared at this time (December 1978). Public hearings will be held by the Commission once the EIR is completed and they will then make

their final recommendations to the Council. The Council will also hold public hearings and adopt the plan.

b. Major Issues

The major policy issue involved in the general plan revision is the amount of future growth of the City. The plan at this time recommends that the City accommodate the future growth projected in the base case report. A related issue concerns the future expansion of the City's boundaries. One large open space area in particular, named Pogonip, adjacent to the City, has generated significant controversy due to the plan's recommendation that the City annex it to provide for future housing needs.

The Plan also calls for the widening of one of the City's major streets and the construction of a major new dam and reservoir. These projects have been under consideration for many years and are highly controversial.

Despite these major growth-oriented policy choices, much of the current general plan proposal is concerned with protecting and preserving the community's environment and character.

A final issue concerns the "housing crisis." The proposed general plan revision includes policies to accommodate anticipated population growth but also emphasizes the need to provide housing opportunities to those groups in the City with special needs or problems, such as the elderly and low income groups.

c. Evidence of Incorporation of Air Quality Concerns

One objective listed in the 1971 report entitled A Policy Basis of the Planning Program was to reduce pollution of the

total environment to the lowest attainable level. The report called on the City to regulate local sources of air pollution, define levels of pollution and prepare reasonable reduction goals, establish emission controls based on the most stringent available standards, establish emission standards for petroleum-powered vehicles and service stations with provisions for enforcement, and recognize pollution as a regional problem in which the City should participate in solving.[9] While these recommendations indicate a concern for air quality, they are not related directly to land use and, in fact, most of them fall under the authority of the air pollution control district.

The Critical Factors report produced for the General Plan Committee considered air quality problems in the section on the natural setting. The report's concern was to identify the City's major problems and this was done by asking questions. The questions asked about air quality were "How much air pollution do we have and can we expect in the near future? What causes air pollution? Can we do anything about it?"[10]

The Base Case report projected that federal and state air quality standards would be achieved through 1994. These forecasts were made about six months before the 1977 Consistency Statement was released indicating the opposite conclusion.[11] The information in the report resulted from an exchange of letters with the Air Pollution Control District which indicated that the standards would be met and that much of the existing problem was caused by transport from the Salinas Valley in Monterey County. The Base Case report included a chart

on projected air quality levels based on this information. The Base Case report has not been updated to consider the Consistency Statement or the designation of the region as a non-attainment area.

The report also stated that improved air quality depended on the correction of a few stationary sources of air pollution, the control of emmisions in the Salinas Valley, and the projected increase in transit use and vehicle occupancy included in the County's transportation plan.

The report did indicate that the base case population projections would, if realized, cause increased traffic demands and greater pollution.

The only policy on air pollution, however, included in the base case policy set recommended reliance "on state conversion controls to minimize air pollution impact of increased automobile usage."[12] The General Plan Committee did not approve this policy and worried more about the increasing contribution of the automobile to air pollution than did the report. Staff, however, did not suggest specific land use measures and, finally, a substitute policy was approved to "encourage use of transit, bicycling and walking to lower pollution."[13]

At about the same time as public comments were solicited on the base case, a questionnaire on the general plan revision was also circulated to the public. One question concerned air quality. In general, little interest in air quality was evoked. One respondent recommended that wind direction be considered in the placement of industries. Another recommended

the adoption of exemplary anti-pollution standards to preserve the area's agriculture and tourism industries. Two people recommended the provision of passenger rail service, two limited growth, and one limiting power boats to achieve air quality. Besides these comments there has been little public mention of air quality concerns throughout the process.

After the General Plan Committee developed the three general plan alternatives, the planning staff prepared a report entitled Review of Key Differences Among General Plan Alternatives.[14] Concerning air quality, this report stated that the prime sources of air pollution in the County were the automobile and external influences from the Salinas Valley. While population increase was seen as a force threatening air quality, the report indicated that federal air quality and auto emission standards would counter this force. Further, the report estimated that in light of the future population projections for the County of between 203,000 and 310,000 people, an increase of the City's population of between 4,000 and 15,000 people, which was the maximum range between the three plan alternatives, would have a minor effect on the region's air quality. Finally, with increased use of public transit, it was argued, the City residents' automobile contribution to air pollution would be even less significant. No specific analysis of the air quality impacts of the alternatives was provided, however.

The report also included a discussion of the transportation implications of the general plan alternatives including an evaluation of the City's goal to have 30 percent of all trips

made by means other than the automobile. The report stated that the attainment of this goal appeared highly implausible over the next 20 years.[15]

The Planning Commission, in preparing their recommendations to the City Council, issued Policies and Programs for Recommended General Plan, which simply listed the recommended general plan policies and programs. It is the last document thus far developed as part of the planning process.

The only policy dealing directly with air quality was in the section on the natural setting and resource conservation. It stated: "As one contributer to the air and water quality of the region, the City of Santa Cruz shall ensure that the highest air and water quality standards will be sought in the implementation of the City's land use regulation."[16] The programs associated with this policy recommended discouraging automobile use through increased public transit, providing pedestrian and bicycle paths, and establishing carpool incentives.

Another policy in the document related to air quality called for an emphasis on alternatives to the auto, especially transit, and for the City to attain the goal for 30 percent of all trips in non-auto modes by 1990.[7] This policy, however, contradicted, to some extent, another policy which recommended new road construction as part of "an efficient and environmentally sound transportation system." New roads typically increase automobile travel. One program suggested for attaining the 30 percent non-auto travel policy would develop an undefined

but comprehensive program of transit incentives and auto disincentives. On the other hand, a second program recommended increasing the amount of parking in the downtown area, which would obviously facilitate, not reduce, auto use.

The policies and programs report also contained a number of land use programs which would potentially affect air quality. From the policies they were designed to implement, however, it appears that air quality was not directly a motive in their selection. The following land use programs affecting air quality were suggested:

- A program to encourage the infilling and intensification of residential land use in the already developed areas was recommended under the policy to accommodate growth to 1990. Since the City covers a large area, however, advocating development within its current boundaries as compared to development in the adjacent areas would not necessarily reduce auto traffic significantly.
- A similar program encouraging infill development on vacant lots and large parcels in the City, rather than promoting development in sparsely developed peripheral areas is recommended under the policy to maintain open space and preserve the City's natural setting.
- A program to study opportunities for intensifying residential land uses in the downtown area, along major streets, and around commercial development as well as to identify suitable locations for mixed uses is recommended under the policy intended to expand housing

choices for the various groups in the City with severe housing needs. The concern here is to try to determine the least controversial areas for the construction of higher density housing, which the City needs in order to accommodate some of the existing and projected demand.

- A program to phase zoning changes and the provision of public services in urban expansion areas so that land is available for development only when needed is also recommended under the policy to expand housing choices.
- A program to provide for neighborhood food and convenience stores within walking distance of residential areas is suggested under the policy to enhance the livability of residential areas by providing needed public facilities and services.
- A program to reduce strip commercial development and designate land for clustered commercial development is recommended under the policy to designate properly located land for commercial use.

Taken as a whole, the implementation of these land use programs would probably have a beneficial influence on air quality as opposed to what would occur without them. On the other hand, they are not strongly worded and are quite general in most cases. There is also no direct evidence suggesting that air quality was a motive in their selection.

The Planning Commission held a major public hearing on their general plan recommendations and several hundred people

attended. The major concerns expressed were with the total amount of growth proposed and, particularly, with the suggested development of the Pogonip area. While air quality was mentioned as a concern by several people, it was always in the context of a general criticism of the growth recommendations.

The City Council in their review of the Planning Commission's recommendations paid scant attention to the air quality policy. While some concern was expressed by Council members in regards to the policy recommendation that the highest air and water standards be achieved, this occurred because the Council is currently seeking a waiver of water quality standards from EPA for a major sewer project and council members didn't want their efforts restricted by a general plan policy. One Council member, however, argued to approve the recommended policy since it is important for the City to strive to achieve high air and water quality standards. The real issue, though, involved water and not air quality.

The interviews with several of the participants in the general plan revision process revealed somewhat differing perspectives on the role air quality concerns played in the planning process.

The planning staff member interviewed felt the air quality concerns were given moderate importance in the planning process compared to other concerns.[18] He considered air quality more in a regional than local context and looked for guidance from regional agencies. In his view, a need exists for more information on air quality as well as greater intergovernmental cooperation.

The staff member indicated that a technical analysis of the air quality effects of the plan was not carried out due to the lack of staff resources, equipment, and the availability of information. There was no good baseline data, for example. (There was also no public demand.)

While the staff did not recommend specific programs related to air quality, he did feel they were aware of the potential air quality impacts of other policies. For instance, increased transit use, intensified commercial use downtown, higher density housing along transit route, commercial areas within walking distances of housing, would all contribute to improved air quality. No specific impact analysis was undertaken, however. They just knew that more people meant more cars and more air pollution. From the staff perspective then, air quality to some extent was a motive in recommending the land use programs affecting air quality.

The staff member felt that land use controls should play a part in improving air quality but that it would be an indirect one. All the local jurisdictions must work together to have an effect. Each is important but cooperation is necessary.

Staff had received information on the air quality-land use relationship, mainly from AMBAG. Most of it was of a general nature and was used, by and large, as background.

In terms of the federal program, staff was aware of it but felt that its impact came through State and regional agencies. Local governments learn about the federal concerns second or third hand, as it were.

In the end, in his view, air quality concerns were incorporated into the plan primarily through transportation policies and programs and land use programs were not very important. In the personal opinion of the staff member interviewed, sanctions might be necessary in order to make local governments work on the air quality-land use relationship directly. A somewhat contradictory picture emerges, then, from this interview, regarding the incorporation of air quality concerns in the general plan process, particularly in terms of land use programs.

From the perspective of a member of both the General Plan Committee and the Planning Commission, there was real concern expressed for the need to maintain clean air as part of the planning process.[19] Air quality concerns were discussed, especially by the General Plan Committee, though the current policy had been watered down.

While there was an awareness that the area's air quality is deteriorating and a strong desire to keep it good, the Committee member had almost no understanding of possible local land use strategies or techniques to improve air quality, or even of the federal concern. The federal program was seen as being involved solely with stationary sources.

The City Council member interviewed had a slightly greater awareness of the air quality-land use relationship but felt that air quality concerns were of little or no significance in the planning process.[20] The Council member, one of the moderates on the City Council, felt that the only Council discussions

relating to air quality were minimal responses to the General Plan Committee concerns, if it was discussed at all. Somewhat more time was spent on transportation issues.

The Council member related air quality-land use considerations to energy concerns. In his view, if people were forced to abandon their cars due to gasoline shortages, land use concerns would be less important because the decline in auto use would create clean air by itself. Now, however, it is possible to concentrate development as a way to decrease auto dependence. This leads to conflict, though, since people don't want to be closed in. The Council member had mixed feelings then, about the desirability or feasibility of adopting land use programs to improve air quality. In any event, he indicated that the decision to implement such programs was a problem for the future and not particularly relevant as part of the general plan revision. He considered the air quality-land use relationship simply in conceptual rather than concrete terms.

As for the role of the federal program in the planning process, the Council member did not seem aware of the federal concern with land use and identified the program as concerned only with stationary sources. He did, however, have general criticism for federal efforts to influence local government activities. He criticized outside bureaucracies for promulgating cumbersome and unrealistic rules and regulations which local governments must follow. Time and again, in his view, local government can't afford them or could find better ways of doing whatever is being required. For this participant,

then, if he had been aware of any federal effort to influence the general plan revision process, he would undoubtedly have resisted it.

d. Summary

While air quality was considered during all phases of the general plan revision process and it was a real concern of some of the participants, the meaningful incorporation of the air quality-land use relationship or the federal concerns was limited. Further, while a variety of land use measures were included which would probably beneficially affect air quality, the plan also included policies which would be detrimental to air quality and no effort to evaluate the balance was attempted. Air quality concerns were included directly in a general way in terms of the importance of achieving standards, for instance. Where they might have a more concrete impact, as with certain specific land use measures, they were only considered indirectly at best. In part, the limited consideration of the air quality-land use relationship was probably due to the insufficient information during much of the process on the extent of the air quality problem in the region, a belief that, at most, the plan's impact on air quality would be minimal, the inability to measure the impact of proposed policies, a lack of knowledge concerning ways to affect air quality directly through the planning process, as well as certain realities about Santa Cruz and the relative urgency of other concerns.

4. Live Oak Area Plan

a. Brief Description of the Planning Process

In 1961, the Santa Cruz County Board of Supervisors adopted

a general plan for the entire unincorporated area of the County. Since that time, specific area plans have been approved for many of the County's subareas. The goal has been to adopt area plans for every subarea of the County and then integrate them as necessary on a countywide basis. Unfortunately, the general planning process has usually been a long one and certain areas of the County are still operating under the 1961 plan.

This was the case for the Live Oak area in 1975, when strong pressure for an area plan developed. Live Oak at that time, as now, was the most urbanized area in the unincorporated part of the County and was a key area in the rapidly growing county because it had a good deal of vacant land available and yet a higher level of public services than anywhere else in the unincorporated portions of the County. In addition, it is adjacent to the City of Santa Cruz.

The push for a general plan started in the spring of 1975 with a newly formed citizens group called the Live Oak Community Action League (LOCAL). This group contacted the County Supervisor for the area and sought approval to set up a citizens committee to participate in the preparation of an area plan. The Supervisor agreed and at that time expected to complete the entire plan in six months.

However, the Live Oak General Plan Advisory Committee (LOGPAC) was not established until December 1975. This group issued a progress report on the general plan including proposed policies in July, 1976.

At about the same time, a reorganization occurred in the group and its composition changed. The original group had a low growth, pro-residents orientation. This changed to a primarily land owner, pro-business orientation. The reorganization, then, fundamentally altered the group's position toward the general plan. This new LOGPAC issued its recommendations in March, 1977.

As a result of a surprise election victory, the incumbent Supervisor was replaced in January 1977 by one with sharply divergent views. The new Supervisor was much closer philosophically to the first LOGPAC than to the second, existing group.

In May 1977 the County Planning Department issued a Draft Live Oak General Plan which incorporated the recommendations of the two LOGPACS as well as the results of the department's own efforts. Ten concepts and four alternative plans were analyzed and compared, and a final plan recommendation made.

This plan was presented to the Planning Commission in June and generated a great deal of controversy. After a series of meetings on the draft plan and directions from the Planning Commission, a "compromise" Live Oak General Plan was prepared in October 1977, and released along with a Technical Appendix and draft Environmental Impact Report.

The Plan was considered by the Planning Commission in study sessions and public hearings, revised slightly, and adopted in February 1978. It then went to the Board of Supervisors where public hearings were again held. The Board made

some minor revisions and finally adopted it in May 1978.

As a footnote to this somewhat confusing and extremely political history, it should be mentioned that in June 1978, the new Supervisor was replaced by the former Supervisor as a result of a recall election. To the present time, however, no attempt to revise or reconsider the adopted Plan has occurred, although there are rumors that it may be brought back for changes.

b. Major Issues in the Plan

The major issues in the Live Oak Area Plan process were the amount of new population growth which would occur in the area and the location of the new development, particularly higher density housing and commercial activities. The role of parks and the location of roads were also of major concern as was the availability of public services generally.

c. Evidence of Incorporation of Air Quality Concerns

Neither of the two LOGPAC reports included a policy on or mention of air quality. The May 1977 Draft Live Oak General Plan did not include air quality in its section on issues and problems nor did it recommend any goals, objectives or policies specifically related to air quality. It did, however, contain an air quality analysis of the four alternative plans and, also, discussed briefly the existing air quality levels and major air quality issues in the area.[21]

According to this draft plan, in a two-page discussion under "Climatic Conditions," a greater concentration of haze could generally be observed over Live Oak than the City of Santa

Cruz. This appeared due to wind patterns in the area. The plan also reported the existence of evidence that an inversion layer, particularly in early autumn, trapped pollutants in the entire coastal area. The plan included a chart depicting the average hourly oxidant level greater than the federal standard on a yearly basis, indicating that these standards were exceeded four days in 1976 for a total duration of seven hours. There was no discussion of the consequences of being in violation of the standards. In fact, the draft plan stated that it is generally believed that the air quality in the Monterey Bay area was good.[22]

The plan was prepared just prior to the release of the 1977 Consistency Statement so, while it perceived the existing problem, it did not include the recognition that corrective action was necessary.

In the section of the draft plan in which the four alternative plans were evaluated, a subsection entitled "Air Quality and Noise" considered the air quality impacts. The draft plan first stated that auto emission rates were required by law to decrease each year as a result of federal and state emission standards, and that, therefore, auto emissions would be much less of a problem in the future. On the other hand, increasing traffic would negate somewhat these improvements. The draft plan then recommended that the County's 30/70 transit/auto modal split objective, other non-auto travel modes and land use planning be utilized to further assure that air pollution not be a problem in the future. The specific implications of

this suggestion were not discussed.

The draft plan indicated that traffic generation, distribution and circulation differences would largely determine the air quality impacts of the four plan alternatives. The consequences would be most pronounced along the major arterials. A table was presented showing the relative increases in the trips for the four plans and it was argued that the air pollution increases would be roughly proportional to these. The overall increases in travel demand ranged from 40 percent in what was called Plan A to 80 percent in Plan B. Plan A was said to have the least increase because it stressed a land use configuration making non-auto travel more probable. The draft plan observed that to determine specific, quantified effects of the four alternatives would require specific traffic assignment to the various traffic arteries. It urged that these be required in the Master EIR on the chosen alternative. No specific information was presented, however, as to how the relative increases in trips under each plan were calculated. It is significant, however, that the plan explicitly recognized the connection between land use patterns, auto use, and air quality and attempted to measure the differences between the alternatives on this basis.

Finally, the draft plan included a chart depicting the relative impacts of the four alternatives on the physical environment. One impact specifically considered was air quality. Plan A was listed as having a low impact on air quality, Plan B and Plan C a medium one, and Plan D a high one.[23] In a

later section and after taking account of a large number of factors, the draft plan recommended Plan A. No direct mention of air quality as a consideration in the decision to choose Plan A was made, however.

In the public response to the draft plan, there appears to have been no discussion of air quality concerns. There was, however, a great deal of comment on the various modes of transportation, though not in an air quality context.[24]

The next version of the general plan was released in October 1977, revised the same month and finally adopted later with some modifications. All three editions contained the same language on air quality.

The plan concluded that the major source of air pollution in Live Oak was and would be from motor vehicle traffic. While identifying regional, state, and national programs as having a greater effect on air quality than local efforts, the plan stated that local land use policies would have some effects. The Plan suggested the following policies to attempt to reduce air pollution: (a) rely primarily on non-automobile modes for increased circulation; (b) concentrate commercial development in designated centers more easily served by transit; and (c) delineate street plans that enable higher density residential development to be served by transit.[25] The first two policies, decreasing auto use and containing commercial uses, were also listed elsewhere in the plan as among its key proposals. The Live Oak Plan, then, explicitly included two land use measures affecting air quality with the motive of

doing just that.

The plan also included a number of other programs which would potentially impact air quality, without tying them to an air quality concern. The following additional land use programs would affect air quality if implemented:

- One of the key proposals of the plan was to restrict the population growth of Live Oak to between 36,000 and 38,000 people during the life of the plan. The projected growth without controls was 42,000 people.
- A program to encourage residential development on small parcels and in large back yards was recommended in the section concerned with the provision of housing for future residents.
- In the same section, a program to build at higher densities, where feasible, on parcels over two acres in order to offer maximum opportunities for housing development was suggested. Both this and the preceding program are consistent with and are intended to implement the County policy to concentrate urban development in the urbanized area. All Live Oak is considered urbanized.
- A program permitting residential uses in commercial districts was also recommended in the housing section, primarily in response to concerns raised by property owners and residents unrelated to air quality.
- Development guidelines to relate the provision of public services with the pace of development was included in the section describing the facilities needed in Live Oak

to implement the plan. One justification contained in this section for providing Live Oak the necessary public services is the County's policy to concentrate development in the urbanized areas.

The Technical Appendix of the Live Oak General Plan included the planning analysis and environmental impact report and was issued at the same time as the revised Plan. In a summary statement of the Plan's impacts, the Technical Analysis concluded that improved air quality would result from the Plan's implementation.[26] The Technical Analysis also contained an eight-page chapter discussing air quality.

This chapter started with the assertion that the air quality of the air basin as a whole determined Live Oak's air quality. It then described the 1977 Consistency Statement prepared by AMBAG which forecasted future air pollution concentrations and emissions and concluded that, even if the reduced automobile travel and higher vehicle occupancy objectives expressed in the transportation plan were achieved, the area would still not attain the federal oxidant standards by 1995. Stationary sources were identified by the Technical Appendix as the most significant contributors to the future problems, even with strict control over new and modified sources. The mobile sources contribution was expected to drop from 64 percent of the problem to 32 percent by 1995. This reduction seemed to be based on the assumption that both the 30 percent transit goal and the federal and state auto emission standards would be achieved, though the Technical Appendix was not clear on this point.[27]

The current air quality in the Live Oak area was described as generally good, although minor to moderate air quality problems were experienced depending on weather conditions. The report then presented the federal and state standards for the five major pollutants and indicated that except for oxidants, none of the standards were being exceeded or would be in the future.

The next section of the chapter described existing air quality management responsibilities of the various public agencies. The role of the Monterey Bay Unified Air Pollution Control District in controlling stationary sources was outlined. The history of mobile source control was briefly described especially in terms of the ARB. The importance of the federal Clean Air Act Amendments of 1970 in setting ambient air quality standards and requiring that they be met was also mentioned. The EPA role in establishing the standards and approving State plans was included here. Finally, the recent attempts by the Board of Supervisors and Transportation Commission to have Santa Cruz County designated as an Air Quality Maintenance Area was cited. The Live Oak Plan, then, although mentioning the federal air quality program specifically did not tie it to the general plan process or discuss the federal concern with land use issues. The federal government was listed as an actor in the planning process but one whose precise role was undefined.

The next section described the specific air quality impacts of the proposed plan. The report anticipated that stationary sources, such as industry, would not be a major source

of future air pollution due to the strict enforcement of emission standards. Motor vehicle emissions were and would continue to be the major air pollution source in the Live Oak area. The report predicted, however, that even though travel demand would increase by 54 percent during the life of the Plan, vehicle travel would decrease by 20 to 30 percent. This estimate was based on the assumption that the 30 percent transit goal would be achieved.

The report then utilized a simple rollback equation to convert the projected 20 percent reduction in vehicle travel to a reduction in pollutants. Assumptions regarding the anicipated decrease in auto emissions due to the effectiveness of the EPA standards were incorporated. The formula was employed for three other pollutants besides oxidants and, also, for the assumption that vehicle travel would increase by 54 percent. This was dubbed "the worst case." In all cases, the results indicated that the standards would be met. In all but one case, air quality would be better in 1995 than it is now. For example, with a 20 percent reduction in vehicle travel, the level of oxidant concentrations would be 20 percent of their current level (an 80 percent reduction). Assuming a 54 percent increase in travel demand, the oxidant concentrations would still be only 39 percent of their current level.

These results, however, were based on the assumption that auto emissions would be reduced by 75 percent in 1995 as a result of the federal and State emission standards. Further, the 20 percent reduced travel demand assumption was estimated

solely on the achievement of the transportation plan goal, rather than specific land use or, even, transportation programs. The 54 percent worst case increase in travel demand also did not consider the land use implications of the Plan and appears to have been based simply on projected population increases.

The final section of the chapter reiterated the conclusion that less automobile use was the best way to reduce air pollution. It indicated that the Plan attempted to encourage such reduction and aid in achieving the 30 percent transit goal through bikeways, pedestrianways, and land use patterns. Also, it argued that concentration of commercial facilities would make one stop shopping more feasible and reduce stop and go shopping caused by strip commercial. No attempt was made to directly relate these programs or the proposed land use patterns to specific reductions in air pollution.

The chapter concluded with a recommendation for continued monitoring, evaluation and forecasting of air quality.

During the long public hearings on the proposed Plan before the Board of Supervisors, little concern for air quality was voiced. Only one speaker directly expressed such concern and another supported the policies for concentrated development and decreased auto use.

While air pollution itself was not directly an issue before the Board of Supervisors, one of the major programs offered to control it was of significant concern at one point. The Board specifically asked the Planning Director to provide additional information explaining how concentrated commercial

development would help reduce automobile trips and encourage transit. In his response, the Planning Director argued that the major factor was one-stop shopping made possible by the clustering of a variety of shopping alternatives. In addition, strip commercial, which leads to the need for a number of stops, was said to be less conducive to transit. The Planning Director's memo also stated that concentrated commercial development was more important in encouraging transit than concentrated residential development due to the densities involved.[28] The reason for the Board's concern over this program was not air quality or even transit use, however. Owners of property along some of the main arterials currently zoned commercial opposed the program to eliminate strip commercial development and the Board sought justification for the recommendations.

Despite the more detailed inclusion of air quality consideration in the Live Oak planning process, it played a relatively minor role from the perspective of the major participants.

In the opinion of the planning staff member interviewed, air quality concerns entered the process mainly as part of the planners' background.[29] They had a general sense of how land use affected air quality but didn't have the time or expertise to do an analytic study. Air quality was incorporated more in the Live Oak General Plan, however, than in any other County plan. In the end, air quality concerns were of minor importance vis-a-vis other concerns, and analysis of the land use impacts

on air quality were not undertaken, in part, because it was felt that differences would be insignificant. Staff relied on transportation objectives to reduce air pollution more than any other local strategy. The staff member's perceptions are interesting in light of the fact that the inclusion of the air quality-land use relationship in the Live Oak Plan was substantially greater than in the City plan.

While the federal air quality program was seen as having relevance to the planning process, its relevance was only in terms of the federal air quality standards. To some extent, according to the staff member, these were used as measures in the evaluation of the Plan. The federal concern regarding the air quality-land use relationship was not mentioned. In fact, the staff member didn't credit even the federal standards with stimulating the inclusion of land use measures affecting air quality. The Planning staff member had a good deal of information on the air quality-land use relationship, though he thought it was incorporated only in a general way.

From the point of view of one of the County Planning Commissioners, neither air quality concerns nor the federal air quality program had a significant effect on the planning process.[30] On the other hand, she felt it did have some impact in that several of the land use programs were derived from the desire not to see the air degraded more. Concentrating development and raising densities were stated as examples of such programs. From her perspective, then, air quality concerns were a motive behind incorporating some of the programs affect-

ing air quality. By and large, however, she saw inclusion of the air quality-land use connection as being due more to heightened consciousness than the awareness of federal standards. In her view, the federal program had raised the level of consciousness regarding air quality. The federal influence, for her, then, was more apparent indirectly than directly. This Commissioner also felt that land use policies would be necessary to achieve and maintain clean air in the future and cited the need for programs to minimize travel by arranging land uses in ways which allowed people to reduce their travel times.

The County Supervisor interviewed, one of the environmentally oriented majority on the Board at the time the Plan was adopted, thought that air quality considerations and the federal air quality program played little or no role in the Live Oak planning process.[31] Moreover, he saw the federal program solely in terms of its effect on stationary sources. He did not mention the federal interest in the air quality-land use relationship. On the other hand, in the Supervisor's opinion, land use control would be necessary to attain and maintain clean air in the future, though not necessarily in the Live Oak area. Land use programs, in his view, should be coordinated with other regulatory programs especially in relation to auto use. Land use affects auto use in terms of the location and kind of living units. The problem is that control over large areas is needed in order to have an impact. Land use controls could also be utilized to prohibit development

outside of already developed areas and also condition development on access to public transit. Moreover, he argued that land uses can be mixed so that people live near where they work and shop. In the end, in his view, a massive rethinking of how land use patterns occur is needed for there to be a major impact on air quality. This Supervisor, then, saw the problem in a regional perspective and predicted the need for major land use changes to improve air quality. The Live Oak Plan was not considered an important vehicle for bringing these about due to its limited scope.

d. Summary

While the Live Oak Area Plan and its development, relative to the City's general plan revision process, included a more significant level of awareness of the air quality-land use relationship and a limited technical analysis of its air quality implications, the participants did not consider air quality concerns as playing an important role. The Plan did include specific land use measures affecting air quality which, in the eyes of one participant at least, were motivated by air quality concerns. The federal program was directly incorporated a number of times, although there appears to have been almost no explicit consideration of the federal interest in the air quality-land use relationship. One participant, however, indicated that the federal government had created the awareness locally of that relationship.

5. Air Quality Element of the Regional Transportation Plan

The discussion now shifts from the general plans to the

air quality management plans. Since these are federally mandated plans, the evidence of federal influence will be sought in terms of an explicit consideration of the federal interest in land use concerns and the inclusion of specific, implementable land use measures as well as the awareness generally of the air quality-land use relationship.

The Air Quality Element of the Regional Transportation Plan (RTP) was required by the State's Regional Transportation Planning Guidelines once it was found by the 1977 Consistency Statement that the federal air quality standards were not being met in the region and would not be in 1995. The existing Transportation Plan was no longer consistent with the Clean Air Act as required by the Guidelines and federal law and had to be revised. Since the RTP is considered a clean air alternative under the Guidelines, the purpose of the Air Quality Element was to show how to implement it in order to achieve and maintain air quality standards.

The Transportation Commission is a planning and funding agency only and cannot directly implement any specific programs it recommends to improve air quality. This is the responsibility of local agencies whose members serve on the Commission. It does have the authority, however, to use its ability to allocate funds as a way to pressure local agencies into implementing meaningful programs. Historically, however, the Commission has not done this, primarily because, as previously mentioned, it follows the policy of "you scratch my back, I'll scratch yours." In this context, only the adoption of specific

implementable programs with explicit decisions as to who was to implement them could be expected to have any effect on the local agencies.

a. Description of the Planning Process

In June 1977, the Transportation Commission accepted the Air Quality Consistency Statement prepared by AMBAG. In September, Commission staff presented a list of suggested programs to reduce pollution and help implement the RTP. The Commission directed staff to include possible courses of specific action that could be considered by the local agencies.

At the December 1977 Commission meeting, staff returned with a draft Air Quality Element Update. The Commission agreed to send the draft to the local agencies and to request their comments and recommendations. A public hearing was also scheduled.

At the public hearing in January 1978, no one from the general public spoke. No comments had been received from local agencies either. Although Commissioners raised concerns at the meeting regarding the proposed Element's lack of specific targets for pollution reduction, specific programs for implementation or time schedules for implementation, the Element was approved. It was set for further discussion at the next meeting.

At the February meeting, one Commissioner presented a letter highly critical of the Element. After some discussion, the Commission directed that staff respond to the letter within two months. No further action on the Element has occurred.

The planning process was somewhat hurried in this case

ostensibly because of the State deadline for completion and, also, because the process for preparing the Non-Attainment Plan was scheduled to start in the near future. However, requesting a delay from the State in order to carry out a more extensive analysis of the issues or undertaking such an analysis in order to lay the groundwork for the Non-Attainment Plan was never seriously considered.

b. Major Issues

The Element included a number of short-term and long-term programs for consideration by local agencies to improve air quality. The major issue appears to have been meeting the federal and State requirement to approve an Element within the time deadline.

c. Evidence of Incorporation of Land Use Concerns

The only major document produced during the planning process was the Air Quality Element itself. No significant changes were made in the original draft during the process.

Under the section on current actions, the Element mentioned that new approaches to land use planning were being considered in three local general plans, including the City of Santa Cruz General Plan Revision and the Live Oak Area Plan. Mixing of uses to reduce travel need and increasing residential and commercial densities as a means of favoring transit use were listed as examples.[32] No further analysis of these plans or programs, however, was made.

The remainder of the Element outlined recommended programs. In the section on stationary sources, the Element urged local agencies to utilize their zoning, permit and environmental

review processes to control air quality. For example, it specifically recommended that consideration be given to an ordinance or zone change prohibiting new or modified facilities which would deteriorate the air and to rules requiring the retrofitting of existing sources, where necessary, so that they meet air quality standards. The Element recognized, however, that the agency with primary responsibility for stationary source control was the Air Pollution Control District. No identification of the localities where such a zone change would be appropriate was made.

In the section on mobile sources, a number of land use related programs were recommended. The first program suggested walking, bicycling, public transit and paratransit as feasible alternatives to the automobile. Specifically, the Element proposed that walking be encouraged by providing for mixed land uses in the local general plans. This was especially important, it argued, in the central city areas and around large commercial centers. The adoption of a sidewalk construction program by local agencies was also strongly encouraged.

Second, as one way to encourage transit use, the Element recommended that land use patterns be changed by increasing residential densities along transit corridors and by increasing commercial densities in existing commercial areas.

Third, land use measures were offered to reduce the need or desire for travel. These included encouraging land use mix and changing land use patterns so that residential areas were not allowed to develop at great distances from areas of

employment and services. Developing an urban service line under LAFCO to confine urban growth to urban areas was also recommended.

The Element, then, contained a number of land use measures which would affect air quality and doing so was obviously the motivation for including them. However, these programs were presented on an almost philosophical level. No specific analysis on where or how to implement them or an examination of their specific impact was provided.

A letter from one of the Commission members critical of the Element and concerned about the incorporation of land use issues was received. The letter maintained that the Element was misleading when it pointed to new approaches in land use planning under consideration by the three local agencies because it ignored the fact that all three plans could also have major negative impacts on air quality as well. The proposed policy in the Santa Cruz General Plan Revision favoring low density housing within the existing boundaries and in the expansion areas of the City was cited as one example of this possibility. The letter recommended that the references to the local plans be deleted until it was clear that they would, in fact, encourage the attainment of air quality standards.

The letter also criticized the Element's land use policies because they were not specific enough, didn't go into any detail, and also, provided no real guidance to local agencies as to what exactly they should do. In this regard, the letter stated that the fundamental problem was the lack of a formula

to relate people and their automobile use to air quality deterioration. Without knowing the specific impacts of alternative land use programs on air quality levels, it was argued, they would be hard to sell to localities and the public. Finally the letter chastized the Element for not considering the effect of the amount of development on air quality. At least, the letter argued, the Element should have indicated the maximum population allowable if air quality standards were to be maintained given certain land use patterns and levels of automobile use. While this letter was briefly discussed by the Commission, no response to its concerns was ever received.[33]

The participants interviewed presented a somewhat different view of the issues involved in the Air Quality Element process than was found in the documents. From the perspective of the staff member interviewed, for example, land use considerations were given major importance in the planning process in comparison to other concerns.[34] This was because, in his view, it is possible to control vehicle miles traveled locally but not the automobile engine. On the other hand, he admitted that no technical analysis to determine the impact of land use controls on air quality was undertaken. He argued, though, that indirectly an analysis was made because staff tried to come up with recommendations to reduce vehicle miles traveled.

The land use policies recommended by staff were, in part, based on recommendations in the State Transportation Plan. The policies were not seen as having an immediate but, rather, a long-term benefit (10 to 15 years). Staff felt that in some

sense the impacts could be major over the long run because they would lead to reduced vehicle miles traveled. Although not presented to the Commission, staff indicated that estimates on distances traveled were made for the policies.

Staff also pointed out a potential problem with the adopted land use policy recommending the location of high density housing along transit corridors. Since bus routes could always be moved in response to changing patterns of demand, the location of the high density housing might not be important. The staff member seemed to feel that the mixing of uses so that people lived near where they worked and shopped was of major importance.

The staff member had received information on the air quality-land use relationship over the years and felt that he had attempted to integrate it into the Element by suggesting specific land use policies for local agency consideration.

In terms of the federal air quality program, it was the staff member's impression that the federal government didn't care one way or another about the land use effects on air quality. In his view, they didn't know the effects of their rules locally and only wanted to take the cars off the road. Land use was of interest only because it appeared to offer one way to reduce automobile travel but, in fact, the federal interest in land use was minimal. In a sense this staff attitude may reflect the frustration resulting from the Commission's unwillingness to strongly push for local implementation of land use measures and the lack of specific federal requirements. On the other hand, it may be a defensive reaction to

questions regarding the general nature of the land use programs proposed by staff in the Element.

The Transportation Commissioner interviewed, a moderate member of that body, believed strongly that land use controls were necessary to achieve clean air but worried about whether they would ever be implemented.[35] She favored growth management and opposed the creation of bedroom communities. In her view, cities with industries should build homes. She also felt that it was unwise to build when public services were at their capacity. The quality of life would deteriorate otherwise, including air quality. She supported the policies in the Element and hoped they would be implemented, although she did not place much importance on the role of the Element itself. On the basis of her previous actions, however, while she would support the policies on a general level, she would probably not support programs to implement them, if these would restrict the private market, and land owners and developers opposed them.

In terms of the federal air quality program, she believed that there was not enough federal concern with the effect of land use on air quality. She was worried that there had been some but that "we don't have it anymore."

In general, though, she was not well informed about the nature of the federal air quality program in terms of any of its areas of involvement.

d. Summary

While the Air Quality Element included land use concerns as a significant factor, it handled them in an extremely general

manner. There was not enough detail provided to determine either how or where the land use measures could be implemented. There was also no analysis of their potential impacts or discussion of their complexities. Though called programs, they were, at best, policy statements. Staff did have the technical knowledge and resources available in the transportation and land use areas to undertake a more sophisticated analysis.

In terms of the federal concern with land use, the participants believed that either the federal interest was not serious or that it had disappeared. There is no direct consideration of it in the Element itself.

6. The Monterey Bay Region Non-Attainment Plan

The Non-Attainment Plan process is the most complex of those reviewed thus far--at least from the institutional standpoint. AMBAG, the Monterey Bay Unified Air Pollution Control District (APCD), the Transportation Commission, and local agencies all play important roles in the planning process. The California Air Resources Board (ARB) and EPA are also involved.

Though the Non-Attainment Plan is regional in its scope, encompassing both Santa Cruz and Monterey Counties, in a fundamental sense it is a local plan. Under federal law, the plan is to contain control measures, as necessary, which the local agencies responsible for their implementation must agree to. More important, as discussed previously, the Board of Directors of AMBAG, the lead agency in the planning process, is composed entirely of locally elected officials who act, primarily, from a local perspective. The other two "regional" agencies, as

well, are controlled and governed by local officials.

a. Description of the Planning Process

The June 1977 Air Quality Consistency Statement, cited above, prepared by AMBAG found that air quality standards were being violated and would continue to be into the future. The federal regulations prepared under the 1970 Clean Air Act Amendments at that time required that an air quality maintenance plan (AQMP) be developed for regions in which such findings were made. The first step in initiating the AQMP process was to seek federal and state designation as an air quality maintenance area (AQMA).

AMBAG and the APCD during the summer of 1977 formally requested that the Monterey Bay Area region be designated an AQMA. A number of local agencies, including Santa Cruz County, joined in that request. AMBAG, in soliciting local support for the designation, indicated that, due to the findings in the 1977 Consistency Statement, the region would eventually be designated an AQMA even without local support. If the localities, on the other hand, showed support and, in fact, initiated the designation request, they would play a stronger role in the subsequent, mandated AQMP planning process. AMBAG, then, appealed to the local desire to maintain local control and resist increased federal influence in order to encourage local endorsement of its efforts. The argument that if localities don't do something they either don't like or don't care about, the federal government would do something worse to them, recurred a number of times during the planning process.

A major event occurred during the summer of 1977, however, which changed the direction of local efforts. The new Clean Air Act Amendments of 1977 were enacted. Under these, the focus switched from AQMAs to non-attainment areas and AQMPs were replaced by Non-Attainment Plans. The 1977 Amendments also mandated that EPA immediately designate the Monterey Bay region as a non-attainment area, since the federal standards were being violated, and also included a very tight time schedule for the preparation and submission of the Non-Attainment Plan to EPA. The Non-Attainment Plan was to show how the federal standards would be met in 1982 or, under certain circumstances, 1987. Finally, the Amendments, as discussed previously, called for a more active local role in the planning process than was provided for under the 1970 Amendments, though the definition of that exact role was rather unclear.

Local attention then switched to the designation of a lead agency to prepare the Non-Attainment Plan. After a number of months of discussion it was agreed that AMBAG in cooperation with the APCD should be designated the lead agency for the purposes of preparing the Plan, with the County Transportation Commission having responsibility for the preparation and adoption of transportation control measures for Santa Cruz County. This approach was agreed upon by the agencies involved and by a number of local agencies, including the Santa Cruz County Board of Supervisors. Since the federal law was unclear regarding the role of local agencies in selecting the lead agency for the planning process, AMBAG solicited support from all of them.

However, it appears that most never acted on their request. The level of local interest actually was rather low at the time. In any event, the ARB designated AMBAG as the lead agency in April 1978.

AMBAG then prepared a work program outlining how the plan was to be produced within the time constraints. The work program called for a number of reports to be prepared over the summer and early fall which, when taken together, would constitute the Non-Attainment Plan. Each report would be reviewed first by the previously described Air Quality Technical Advisory Committee (TAC), composed of staff representatives of local, State and federal agencies as well as business and industry, and then by the AMBAG Board of Directors. It would subsequently be released for comments to local agencies. The final plan would be based on the original reports and the comments received.

The first report entitled Purposes and Objectives of Non-Attainment Planning in the Monterey Bay Region was released in June 1978. The next report entitled Existing Air Quality Programs in the Monterey Bay Region came out in July. Neither of these reports engendered much controversy among either the TAC or the AMBAG Board of Directors.

With the next report, however, Air Quality Conditions and Trends in the Monterey Bay Region, serious difficulties surfaced. This report identified existing air pollution emissions for stationary and mobile sources in the region and projected their future levels. These were then compared with the

estimated reductions that would be necessary to attain the air quality standards. The amount of required reduction depended on the size of the violation and the standard to be met. Under the federal law, the second highest one hour reading in the region over a year's period was considered the violation to be corrected.

A disagreement developed over the size of the region's violation. The real issue concerned the role of transport in causing violations. EPA and ARB had agreed to throw out entirely the region's highest reading of .21 ppm because of their findings that it had indeed been caused by transport. They determined, however, that a second highest reading of .14 ppm could not be adequately tied to transport and the reduction should, therefore, be based on that. The local staffs, led by the APCD staff, argued that in their view the .14 ppm reading was probably caused by transport and that a .12 ppm reading should be utilized.

There was also a disagreement regarding the federal standard to be met. EPA is currently considering raising the oxidant standard to .10 ppm which is the current State standard. On the other hand, .08 ppm is the current standard and EPA argued that by law the plan must show attainment of it. Again, the local staffs pushed for the .10 ppm standard.

The impacts of the different options on required emission reductions is extremely significant. If the EPA position prevailed, based on the highest violation (.14 ppm) and the highest standard (.08 ppm), emissions would need to be reduced by

67 percent. If the locals succeeded, with the lower violation (.12 ppm) and the proposed standard (.10 ppm), the reduction in emissions would only need to be 25 percent.* EPA never retreated from their position, though they suggested that the plan be prepared in a way so that if and when the new standard was adopted, the no-longer-necessary control measures could easily be dropped from the plan. This approach was never accepted by AMBAG staff and the draft plan used the .12 ppm violation.

The disagreement over the required reductions delayed the release of the third report and generally slowed down the entire process. Partially due to this and also due to the fact that the original time schedule was unrealistic, AMBAG revised the schedule in September 1978, allotting more time to produce the plan and less time for local and State review.

At the heart of the plan are the control strategies. Originally, AMBAG intended to prepare one report identifying the strategies and another evaluating them. Due to time constraints these were combined. In late September the report entitled Candidate Air Quality Control Strategies was released to the TAC.

The schedule called for review of the control Strategies by the APCDs, Transportation Commissions and the TAC in October and the preparation and review of the draft plan in early

*Since the relationship between the air quality concentrations and required emission reductions is based on a complex formula, these percentage reductions cannot simply be derived from the difference between the concentration levels. The report describes the process used.

November with adoption soon afterwards. Under this schedule, the original deadlines could be met with submission to the ARB in November and EPA in January. The APCDs, Transportation Commissions and the TAC did review the control strategies in October but the draft plan was not released until mid-November. It is now clear that the AMBAG Board of Directors will not finally act on the plan before the public and local agencies have an opportunity to review, comment and, where appropriate, adopt it. The current goal is for AMBAG to adopt it in January 1979. The draft plan has been sent to ARB for their review.

Part of AMBAG's reluctance to act quickly is due to the fact that most of the limited input received from local governments has been negative. While no formal comments on the earlier reports were received, a number of agencies in Monterey County expressed opposition to the entire process and even had AMBAG study the possible consequences of not doing a plan. A major thrust of the TAC meetings, also, has been to figure out how to do as little as possible. In Santa Cruz, the Transportation Commission has been supportive of the plan, though the local agencies have thus far said nothing (late November). To some extent, then, the perceived expansion of federal influence over local affairs is being met by resistance.

Although the planning process is not yet completed, it does not appear likely that stronger control measures than recommended in the plan, particularly in the land use area, will be added.* Therefore, the reports prepared thus far and the draft

*The AMBAG Board of Directors subsequently adopted the plan on December 27, 1979 with only minor changes from the draft.

plan are likely to include the maximum incorporation of land use issues which will occur.

b. Major Issues

The major issue in the planning process thus far has been the amount of emissions reduction which will be required. The general local preference is to have nothing greater required than what would occur through the application of currently projected APCD controls on stationary sources and anticipated reductions due to the continued implementation of the federal and State automobile emission standards.

While transportation control measures have not been discussed extensively to date, a general resistance to them will probably result if they entail more than what localities are currently doing or planning to do. The major transportation control measure recommended in the draft Plan is a mandatory annual inspection and maintenance program for automobiles. While critical for the maintenance of auto emission standards, it is also controversial, difficult to implement, and dependent on State action.

c. Evidence of Incorporation of Land Use Concerns

All of the major documents produced in the planning process included some consideration of land use issues. The Work Program for Non-Attainment Planning, which outlined the steps in producing the Plan was issued in May 1978, and discussed land use issues in terms of their proposed incorporation in the forthcoming reports.[36] The expectation was also expressed that cities and counties would revise their general plans,

where necessary, to conform to the Non-Attainment Plan. Local agencies would be encouraged to incorporate Non-Attainment Plan objectives into the planning and decision-making of City and County growth management plans, local coastal programs, sewer and water facility plans and sphere of influence plans as well. In addition, it was anticipated that the Non-Attainment Plan would be coordinated with other regional plans, including the regional land use plan.

The Work Program indicated further that existing local and public service districts' plans and programs for managing the type, density, location, timing and quantity of urban and suburban development would be reviewed in light of their potential air quality impacts. The intention to compile and evaluate land use management programs in the proposed report on air quality control strategies was also mentioned. It is interesting to note that neither of these work items were carried out in subsequent reports or in the plan, except at the most general level.

The first report entitled Purposes and Objectives of the Non-Attainment Plan in the Monterey Bay Region stated that the Plan would consider land management strategies when they were tied to population size and/or distribution.[37] This also was never done.

The report reviewed a number of existing air quality objectives in the region. It outlined the air quality related policies of the Santa Cruz Transportation Commission (which were also related to land use), including minimizing the use of

fuels, providing sufficient alternatives to the automobile, providing for the reduction in the length of trips, and encouraging carpools and transit. The AMBAG regional goal relating air and water quality to both transportation and land development planning was also included. Specific mention of the regional Land Use Element policies recommending compact urban growth and balanced land use was made as well.

The report further indicated that many localities already had goals advocating compact and balanced urban development, and relating land use and transportation to air quality. It specifically described Santa Cruz County's San Lorenzo Valley Area Plan which contained policies to maintain high air quality by restricting or eliminating all sources of air pollution, encouraging less polluting transportation alternatives, and restricting various stationary sources, such as open burning. No analysis of this plan's implementation was included. Also, the Live Oak Area Plan, though completed by this time, was not mentioned.

The report concluded that most local plans include some indirect land use control policies affecting air quality, such as supporting the APCD, but only a few plans contain direct, area-specific policies that are enforceable (no examples of these are provided). The report then argued that the Non-Attainment Plan offered the opportunity to avoid air quality problems accompanying growth.

The criteria for evaluating the meaningfulness of land use programs affecting air quality mentioned in this report

are significant. They should be kept in mind when evaluating the land use programs of the Non-Attainment Plan itself. The programs should be direct, area-specific, and enforceable.

The next report, Existing Air Quality Programs in the Monterey Bay Region, presented a more detailed discussion of land use concerns.[38] The report commenced with the statement that the Non-Attainment Plan would contain control measures for meeting and maintaining air quality standards, possibly including land use controls.

The report later discussed the role of the APCD, including its potential effects on land use. This potential stems from its ability to require permits to build or modify a source emitting air pollution. A permit can be denied if the proposed emissions would interfere with the area's capability to meet or maintain standards. Industrial land use activities, then, can be regulated by the APCD at least in terms of their emission levels.

The report also considered land use programs directly. It stated: "Land use affects air quality because it greatly determines the amount, type, and location of pollutant-emitting activities in an area."[39] The report then stated that stationary sources were generally associated with industry and mobile sources with the amount of residential use. Population level was related to vehicle miles traveled--more people means more cars, more driving, and thereby, more air pollution. The report continued by suggesting that the way land uses were arrayed and combined would affect air quality. Residential

distance from employment and the fact that scattered low density development relies on the automobile were offered as examples of this fact. It argued also that the special character of land uses could affect air quality--for example, tourist generators.

The report continued with a discussion of the potential impacts of land use controls on air quality. It indicated that localities can significantly influence air quality levels by controlling the type, intensity, timing and amount of development. Direct controls were mentioned, such as zoning, subdivision regulations, development phasing controls, annexation policies, development quotas and moratorium. Indirect controls were also listed, such as the placement and sizing of sewer, water and transportation facilities. However, no detailed or specific analysis of these techniques was included. Though of limited usefulness, these statements do indicate an appreciation of the air quality-land use relationship.

The report then described the air quality considerations found in existing local land use programs. It began by stating: "Local governments in this region have not directly incorporated air quality considerations in their land use management functions to any great extent."[40] Specifically, it noted that air pollution was seen as a regional problem which localities could not effectively address. They also lacked the information and expertise on methods to deal with air quality problems through land use techniques. Localities, according to the report, relied on the APCD for air quality

control. They addressed air quality primarily through the EIR process, which typically identified the impacts of a particular development as insignificant.

The report, finally, considered growth control and argued that setting and enforcing growth rates below the free market was an obvious and direct way to minimize air pollution. Santa Cruz County was mentioned as currently developing a growth management system which might do this. The ARB was cited as having occasionally imposed indirect growth constraints on areas by requiring capacity limitations on new sewer facilities. Monterey County was given as an example of where this occurred. The report concluded by suggesting the Non-Attainment Plan as a mechanism which could relieve the need to restrict growth by showing that air quality standards could be met with other control strategies. The report, then, after listing a large variety of land use measures, including growth restrictions, which would beneficially affect air quality, concluded with the near advocacy of an approach which would eliminate the incorporation of any land use program. It is possible to see this conclusion as an attempt by AMBAG to sell the Non-Attainment Plan to localities on the basis that it could assist them in resisting federal and State controls in other areas.

The third report, Air Quality Conditions and Trends in the Monterey Bay Region, did not deal with land use programs directly but made a number of points relevant to land use considerations.[41] First, the report stated that air pollution growth rates were derived primarily from population growth

rates, since population growth was the driving force behind the expansion of most activities which pollute the air. The report also discussed the differences between various population projections and indicated a hope that "more realistic" projections currently being prepared would estimate a lower future population level and, thereby, would lower required emission reductions. The intention, here, appears to have been to control future population levels not by public policy but through the talent of population analysts. Further, at this point the objective was to substantiate a lower population level to lower the level of required emission reductions. On the other hand, the earlier report seemed to favor a higher population level in order to justify the sewer capacity applied for. While there may be a point where both these objectives could be achieved, this is not presented anywhere in the planning documents.

The final report, Candidate Air Quality Control Strategies, was divided into sections on stationary source, transportation, and land use control strategies.[42] At the outset, the report distinguished the land use strategies from the others. These were said to be long-term in nature and designed to maintain compliance with air quality standards after the other control strategies attain them. They were also, according to the report, more general in application so it was not possible to estimate their ability to reduce emissions or their potential cost-effectiveness, as was done with the other strategies. The proposed transportation control strategies, which were directed

towards reducing automobile traffic, did not specifically recommend any land use proposals to assist in their implementation.

The section entitled "Land Use Strategies" was three pages long in a report of over 90 pages. The first strategy recommended was to support the proposed action of the AMBAG Land Use and Housing Element promoting concentrated, balanced development. However, to a large extent, the programs listed to implement this strategy involved simply providing information and assistance to local agencies with growth problems. One further program would utilize the A-95 review process to review and comment on large developments in terms of their relationship to balanced and concentrated land use. No direct connection was made between these objectives and specific local general plans. The discussion of this strategy argued that the programs to implement the strategy were consistent with clean air objectives "since it is generally assumed that compact development with housing close to jobs places less reliance upon automobile driving, and is more conducive to mass transit, than other types of development."[43]

The second general strategy recommended that AMBAG provide technical assistance to local planners in the preparation and review of EIRs. The third strategy suggested using the A-95 review process to review and comment on projects with significant air quality impacts in terms of the Non-Attainment Plan. Finally, the report proposes to prepare and seek local endorsement of new (and lower) regional population projections based

on the AMBAG Economic Study.

These land use strategies are extremely general in nature. They certainly do not conform to the criteria cited in the earlier Non-Attainment Plan report that land use programs be direct, area-specific and enforceable. The proposed programs appear particularly weak in light of the strong statements made throughout the reports regarding the potential positive impacts of land use measures on air quality. The proposed land use strategies and programs also seem based on the mistaken assumption that the Non-Attainment Plan is a plan to guide only AMBAG, the regional agency. In fact, its purpose is to indicate how every agency in the region can help, as needed, achieve and maintain the air quality standards. It would be entirely appropriate to include area-specific programs in the Plan.

The Draft Non-Attainment Air Quality Plan for the Monterey Bay Area, released on November 15, 1978, as far as land use is concerned, contained nothing more than what was included in the earlier reports and was previously described above.[44]

Since the AMBAG Board of Directors had not seen the Draft Plan or even the report on the Control Strategies at the time the interviews were carried out, only the AMBAG staff member responsible for the land use issue was questioned.

In general, he was very much influenced in preparing the reports by the political constraints he perceived to incorporating land use in a meaningful way in the Plan.[45] He cited the example of ABAG (Association of Bay Area Governments) where the land use policies were eliminated from the air quality

plan at the final stages by the political decision-makers. He doubted that local governments in this region would go along with meaningful land use programs either.

While land use was given a moderate degree of consideration in the Plan, the staff member felt that its impact would be minimal. This was partly due to its being controversial but also to the difficulty in measuring the relationship to air quality analytically. In his opinion, many assumptions and a technical analysis would be necessary to study the specific impacts. Such a study would require a tremendous amount of work and he doubted AMBAG's capacity to do it. On the other hand, a good deal could be done if there was a commitment on the part of the local agencies to do something with the results. Otherwise, it would not be worth the effort. He did not think the commitment existed.

In terms of the federal air quality program, the staff member believed that the federal concern with land use was waning, that because they had received so much flack from the indirect source review and parking management proposals, they had backed away from land use issues.

AMBAG staff was well informed about the air quality-land use relationship. The staff member interviewed was familiar with most of the relevant State and federal publications on it. He also had experience elsewhere of a technical nature relating land use and air quality considerations.

The basic problems, in the staff member's view, with incorporating land use into the Non-Attainment Plan were

political. He felt that if land use strategies were kept general enough, they might not be eliminated. On the other hand, a specific Emissions Allocation Planning Procedure, for example, would not be bought by the AMBAG Board of Directors. It might be possible for the plan to require all local agencies to revise their general plans to be consistent with the Non-Attainment Plan, but this would be meaningless since the Plan itself is so general.

d. Summary

Land use received broad but not deep consideration in the Non-Attainment Plan process. The air quality-land use relationship was mentioned often but, in fact, treated superficially. For example, a technical analysis to incorporate land use concerns into the air quality planning process, though difficult and complex, could have been carried out with some sophistication but, for political reasons, it was not. Specific land use measures were also discussed at some length and, even, presented as potentially effective programs. However, the land use strategies and programs finally recommended are neither direct, area-specific, nor enforceable. The direct federal concern with land use was not considered during the planning process and the staff member most involved thought the concern was waning. While the early documents promised substantial consideration of land use issues, these were not fulfilled in the later reports on the draft plan.

On the whole, the Non-Attainment Plan process was characterized by a good deal of friction between federal and local

levels. A number of local governments perceived an attempted expansion of federal influence over local matters and tried to resist. The local reaction was not so much to federal intervention in the land use area as with transportation controls and, probably most important politically, industrial developments.

7. Analysis of the Indicators of Federal Influence

Having described the four planning processes in some detail, it is now appropriate to review the evidence in terms of the indicators of federal influence defined previously. The task here is to measure, as systematically and analytically as possible, the extent to which the federal program and air quality-land use considerations were included in each and then to compare the four cases.

Previously, the following three broad measures of federal influence on local land use planning decisions were identified:

- Indicators of direct federal influence;
- Indicators of the presence of the air quality-land use relationship;
- Specific land use measures affecting air quality.

While it is not possible to quantify the evidence, meaningful units of measure can be identified for each category. The units should be viewed as points along a scale of potential federal influence ranging from nothing to major significance. The units, then, indicate relative rather than absolute differences.

For the first two categories of indicators, four units of measure are utilized. In reviewing the evidence in each case

by indicator, a decision will be made as to which of the following the data indicates:

- no federal influence;
- minimal federal influence;
- moderate federal influence;
- major federal influence.

Table 8 on page 297 summarizes the results of the analysis.

a. Indicators of Direct Federal Influence

Neither general plan explicitly considered the federal concern with land use measures, although the County Planning Commissioner credited the federal government with raising the level of consciousness regarding the air quality-land use relationship. Both general plans cited the federal air quality program, at least in terms of standards. The consideration was more detailed in the Live Oak Plan containing, for example, a discussion of the role of federal automobile emission standards. On the other hand, most of the decision-makers in both cases, did not see the federal program as playing a direct role and, in fact, did not realize that there was a specific federal land use concern. The extent of direct federal influence, then, is rated as minimal in the City of Santa Cruz general plan and moderate in the Live Oak Plan.

With the air quality plans, the federal influence is measured in terms of the explicit incorporation of the federal concern for the air quality-land use relationship in the plans. The Air Quality Element makes no mention of a federal role in stimulating the land use programs recommended. In fact, from

the staff member's perspective, the federal government didn't care one way or the other about land use concerns. Also, the decision-maker was unaware of the federal interest in land use.

The Non-Attainment Plan does indicate, on the other hand, an awareness of the federal thrust in land use, particularly on the staff level. Though explicit mention of the federal concern does not occur in the documents, the federal interest clearly permeates many of the discussions of land use matters. In addition, the staff member interviewed, though concerned that the federal interest was waning, was well aware of the changing federal involvement in the air quality-land use relationship.

The extent of direct federal influence is rated as non-existent in the Air Quality Element and minor in the Non-Attainment Plan.

b. Indicators of the Presence of the Air Quality-Land Use Relationship

1) The plan contains some considerations of air quality-land use concerns

This indicator gauges the general breadth and depth of the air quality-land use consideration. While each of the plans include air quality or land use concerns, they represented in all four cases a relatively minor consideration. The Air Quality Element and, especially, the Non-Attainment Plan contained a relatively large number of words on land use matters but these were consistently at a high level of generality. The evidence does not back up the Air Quality Element staff

member's contention that land use concerns played a major role in the plan. For both air quality plans, there was a good deal of breadth but not much depth.

The Live Oak Area Plan provided the most serious consideration of air quality concerns of all the plans, although, there too, it was limited. An awareness of the air quality issue informed all the major documents and efforts were made to incorporate air quality concerns in a meaningful way. On the other hand, the planning staff member interviewed thought that air quality played only a minor role in the process. With the City's general plan revision, air quality concerns were relatively unimportant, particularly in terms of their direct connection to land use programs.

The extent of federal influence, then, is rated as moderate for the Live Oak Area Plan and minimal for the other plans.

2) <u>The plan contains specific air quality-land use goals, policies, or programs</u>

This indicator concerns the explicit air quality-land use goals, policies, and programs in the plans. Each plan contains at least one relevant goal, policy, or program, although, by and large, they are quite general in nature.

The City's General Plan revision contained one explicit air quality policy, though it was not linked to land use measures. The Live Oak Area Plan, on the other hand, included specific land use policies and programs in the section on air quality, specifically in order to reduce the amount of air pollution.

The Air Quality Element contained a number of land use policies, called programs, but they were all general and non-area specific. They do represent, however, a substantial portion of the Element. The recommended land use policies of the Non-Attainment Plan, called strategies, and its programs are extremely general in nature. While the Plan described a number of implementable land use programs, they were, finally, not recommended.

The extent of federal influence here is rated as minimal for the City's general plan revision and the Non-Attainment Plan and moderate for the live Oak Plan and Air Quality Element.

3) <u>The plan contains a technical analysis of the air quality-land use relationship</u>

Only the Live Oak Area Plan process contained any serious attempt at a technical analysis of the air quality-land use relationship. The draft plan evaluated the air quality impacts of four major alternatives based on estimates of their projected vehicle miles traveled. While the methodology was relatively simple and was not completely clear, it appears that the different proposed land use patterns contributed to the results. The revised plan also was subjected to an air quality analysis though it was related more to the transportation goals than to projected land use patterns.

It should be mentioned that, since the EIR has not been done for the Santa Cruz General Plan Revision, it is possible that a similar analysis will be included when it is prepared.

Since the federal government has had such a major influence

on developing the tools to perform a technical analysis of the air quality-land use relationship, the meaningful inclusion of such an analysis would have provided a relatively solid evidence of federal influence. However, in three of the plans, no technical analysis was undertaken and in the Live Oak Area Plan it was minimal.

4) Air quality-land use concerns were discussed publicly as part of the planning process

In all cases, little public discussion of air quality-land use concerns occurred. With the Santa Cruz General Plan Revision, there was some discussion by the General Plan Committee and by a few members of the public at that stage. There has been almost none since then and, when air quality was mentioned, it was always in the context of a wider issue, i.e., as one of the benefits of low growth.

There was even less discussion of air quality concerns with the Live Oak General Plan. A few people mentioned it at public hearings but the Planning Commissioner and Supervisor interviewed did not even remember that it had been part of the process.

The only public discussion regarding land use which occurred as part of the Air Quality Element was contained in the critical letter from one of the members of the Transportation Commission and it was virtually ignored.

Finally, with the Non-Attainment Plan, there has, at this point, been little discussion of the plan itself, let alone the land use considerations. The TAC, moreover, has assiduously

avoided any discussion of land use and the AMBAG staff appears to be consciously seeking to sidetrack any public discussion by recommending innocuous policies.

The extent of federal influence here, then, is rated as minimal in all cases.

5) Decision-makers direct their staff to include or delete air quality-land use considerations during the planning process

This indicator is directly related to the last one since discussions of air quality-land use concerns are not very meaningful if they do not have an effect on the plan.

However, by and large, decision-makers gave no directions to staff to add or delete air quality or land use recommendations from the plans. The only time it occurred at all was when the General Plan Committee rejected a policy proposed for the City's General Plan Revision which relied solely on federal State programs to protect the air and substituted a policy to encourage alternatives to the automobile. In the other cases, the decision-makers accepted the policies and programs recommended by staff.

The Non-Attainment Plan process has somewhat special circumstances, since the decision-makers have not yet acted on the draft plan. However, there is clear evidence that the staff recommended only the weakest land use measures because of the expectation that the decision-makers would delete anything meaningful. The evidence here is that there was a conscious attempt to avoid federal influence.

With this indicator, then, the extent of federal influence is rated as minimal for the City's General Plan Revision and nonexistent in the other cases.

6) The staff of the planning agency is knowledgeable about the air quality-land use relationship

This indicator examines the degree of local awareness of the information presented in the previous chapter on the relationship betweeen air quality and land use, and the ability and willingness to use it.

The cases revealed a wider range of response for this indicator than for any other. City of Santa Cruz staff were least familiar with current knowledge of the air quality-land use relationship and the procedures for incorporating it in the planning process. The relied on AMBAG and APCD staff to provide back-up material when it was needed.

The staff working on the Live Oak Plan were more aware of the relationship and some of the procedures. However, their approach was transportation oriented to a large degree. In part, this was due to the fact that the staff with primary responsibility for carrying out the air quality analysis in the Live Oak Plan was also the staff to the Transportation Commission and had learned about the air quality-land use relationship in the context of transportation planning. The Transportation Commission staff worked on the Live Oak Plan because they were physically located in the County Planning Department and serve as the transportation planners within the department

as well as staff to the Commission. As staff to the Live Oak Plan they were relatively the most willing to use their knowledge.

Since this staff also wrote the Air Quality Element, the level of staff knowledge was obviously the same for both plans. However, as staff to the Transportation Commission they were not willing to use their knowledge to any great extent.

The AMBAG staff preparing the Non-Attainment Plan had the most extensive knowledge of the air quality-land use relationship and the procedures for incorporating it in the planning process. The staff was very familiar with the federal land use initiatives, with the Emission Allocation Planning (EAP) procedure, and with many of the various models which could be utilized. AMBAG staff also had the most experience working directly on the air quality-land use relationship. On the other hand, though the AMBAG staff had the most information, they were the least willing to use it.

The extent of federal influence here is rated as minimal for the City's General Plan Revision, moderate for the other three cases.

7) <u>The local agency allocated its own funds to study the air quality-land use relationship</u>

The willingness to allocate local resources would represent a strong commitment to the incorporation of the air quality-land use relationship, and, thereby, indicate a significant federal influence.

In fact, however, no local funds were provided to

specifically investigate the air quality-land use relationship in any of the cases. To the extent it was incorporated into the planning process, staff utilized information readily available.

c. Summary of Indicators for First Two Major Categories

Table 8 displays the results of the previous analysis in summary form. The column on the left hand side of the chart lists the indicators considered. The four plans are displayed along the top of the chart. The symbols in each box represent the extent of federal influence found in each plan. A zero (0) signified that no evidence of federal influence was present. The pluses (+) denote the range of federal influence from minimal (+), to moderate (++), to major (+++).

One general finding which is readily discernible from the table is that the extent of federal influence in all cases was relatively minor. No evidence of major federal influence, for example, was found and for a number of indicators and cases the federal influence was found to be nonexistent. The second general finding which is apparent from the table is that the federal influence in the Live Oak Area Plan was relatively greater than in the other plans. Possible explanations for these findings will be discussed following the evidence of the third major indicator category.

d. Specific Land Use Measures Affecting Air Quality

In seeking evidence of a federal influence on local land use planning decisions, the third major category of indicators

Table VIII

THE EXTENT OF FEDERAL INFLUENCE ON FOUR LOCAL PLANNNING PROCESSES

Indicators of Federal Influence*	City of Santa Cruz General Plan	Live Oak Area Plan	Air Quality Element	Non-Attainment Plan
a. Direct Federal Influence	+	++	0	+
b. Influence through Presence of Air Quality-Land Use Relationship				
1. Air quality-land use considered	+	++	+	+
2. Specific air quality-land use goals, policies, programs	+	++	++	+
3. Technical analysis of relationship	0	+	0	0
4. Public discussion of air quality-land use concerns	+	+	+	+
5. Decision-makers add air quality-land use concerns	+	0	0	0
6. Staff knowledge of relationship	+	++	++	++
7. Local funds to study relationship	0	0	0	0

Legend: 0 = no federal influence indicated

\+ = no minimal federal influence indicated

++ = moderate federal influence indicated

+++ = major federal influence indicated

*See text for explanation of indicators

examines the incorporation in the plans of land use measures which specifically affect air quality. For the general plans, these measures are analysed to determined whether air quality was a motive for their inclusion. An indication that air quality was a motive points to the existence of an indirect federal influence since the awareness of the air quality-land use relationship is considered here as resulting primarily from federal activity.

For the air quality plans, the measures are examined to determine the likelihood that they will be implemented on the local level. If the measures are incorporated in such a manner that they are likely to be acted upon by local governments, evidence of a real federal influence on local land use planning decisions is indicated. The three criteria presented in the Non-Attainment Plan will be utilized here to measure the likelihood of local implementation. The land use measure must be direct, area-specific, and enforceable.

The following analysis will review the evidence from the case studies in terms of the land use measures affecting air quality selected from some of the strategies and techniques discussed in Chapter II and presented earlier. These were:

- Compact urban development
- High density development along transit corridors
- Mixed uses
- Population growth limits
- Concentrated commercial development
- Restrictions on the extension of public services

- Relating residential development permitted to project local employment
- Emission density zoning

Rather than restate the relevant material from each case study, Table 9 summarizes the results of the analysis and indicates not only which land use measures were included in each plan but the evidence of federal influence as well.

The eight land use measures are listed in the column along the left hand side of the chart. The plans are arranged along the top of the table. The empty boxes signify that the particular land use measure was not found in the particular plan.

A box containing a plus (+) indicates that not only was the land use measure included but that, for general plans, there was evidence that air quality was a motive and, for air quality plans, the measure appeared likely to be implemented at the local level. Boxes with a minus (-) indicate that while the land use measure was included, there was no evidence that, for general plans, air quality was a motive or that, for air quality plans, the measure was likely to be implemented. Boxes with a question mark (?) signify that the land use measure was included in the plan but it is unclear, for general plans, whether air quality was a motive and, for air quality plans, whether it will be implemented.

A number of findings can be drawn from Table 9. For the City of Santa Cruz General Plan Revision, while a number of land use measures affecting air quality were included, it is doubtful that air quality was a motive.

Table IX

THE INCLUSION OF LAND USE MEASURES AFFECTING AIR QUALITY IN THE FOUR LOCAL PLANNING PROCESSES AND EVIDENCE OF FEDERAL INFLUENCE

Land Use Measures*	City of Santa Cruz General Plan	Live Oak Area Plan	Air Quality Element	Non-Attainment Plan
1. Compact Urban Development	?	-	-	-
2. High Density Development	?	+	-	-
3. Mixed Uses	?	-	-	-
4. Population Growth Limits		-	-	-
5. Concentrated Commercial Development		+	-	-
6. Restrictions on Public Services	?	-	-	-
7. Residential Development Related to Local Employment			-	-
8. Emission Density Zoning				-

Legend: + = land use measure included
For general plans, air quality was a motive
For air quality plans, measure implementable

\- = land use measure included
For general plans, air quality not a motive
For air quality plans, measures not implementable

? = land use measure included
For general plans, unclear whether air quality a motive
For air quality plans, unclear whether implementable

*See text for explanation

However, there is some contrary evidence. This is the staff member's awareness of the air quality implications of the land use programs. It is unclear whether that awareness signified that air quality concerns partially motivated the recommendations, or whether it would simply be used as one justification of the measure if it was opposed. On the other hand, even if air quality concerns did not motivate the inclusion of the land use measures and would only serve to help justify them, the presence of some limited degree of federal influence is indicated.

For the Live Oak Plan, clear evidence exists indicating that air quality was at least a partial motive for including some of the land use measures. For other measures, air quality did not seem to be a consideration.

While both the Air Quality Element and the Non-Attainment Plan contain a variety of land use measures affecting air quality, none of these seemed very likely to be implemented. The recommended measures were neither direct, area-specific, nor enforceable. Moreover, for the Non-Attainment Plan, while almost all of the land use measures were discussed, only two were even indirectly recommended and these at a general, unenforceable level.

8. Evaluation of the Evidence

The analysis of the indicators in the previous sections led to two general findings regarding the extent of federal influence on local land use planning decisions. For the four case studies considered here, the evidence indicates that,

first, the extent of federal influence was minimal and, second, in relative terms the federal influence was stronger in the Live Oak Area Plan than the other three. These findings were supported whether the federal influence was measured in terms of the direct consideration of the federal interest, the incorporation of the air quality-land use relationship, or the inclusion of specific land use measures affecting air quality.

There are several possible explanations for these findings which can be taken from the available evidence.

First, the following probably played a role in minimizing the extent of federal influence:

a) The air quality problem in the Santa Cruz area is not perceived to be of major significance. While the violation of federal standards is recognized, there is no sense that a crisis exists. In fact, a number of participants blame the local problem on the transport of polluted air from elsewhere. Although there is reliable evidence that the transport issue is overrated and at least some of the problem is created locally, it is still usual to discuss the violations as "their" problem, not ours.

Krier and Ursin in their study entitled Pollution and Policy discuss this factor in terms of the general reluctance of government to respond to a problem in a meaningful manner when there is no crisis at hand. While they advocate the study of the air pollution problem before it becomes too serious, they found that this rarely occurs.[46]



'Say, whatever became of that air pollution scare?'

Source: U.S. HEW, No Laughing Matter

b) The federal air quality program itself does not foster the consideration of the air quality-land use relationship. At this time, neither the federal nor State program insist that it be incorporated locally. At best, the federal government encourages its inclusion, but this encouragement, to the extent it exists, has not filtered down to the local level to any great degree. Most of the participants in the planning process were not even aware of a federal concern to link air quality and land use or doubted whether a serious federal interest really existed.

The federal interest, then, in expanding its direct influence locally in this area at this time is quite limited. For whatever reasons, it is not willing to put the heat on local government and actively pursue the incorporation of the land use-air quality relationship.

c) There is a lack of active public concern. Air quality is not a major issue at this time. There is a general interest in clean air and people are worried about the threat of future deterioration. Every decision-maker will express this concern. However, there is no active, organized involvement in understanding the air quality problem, including the land use implications, or in doing anything about it. Other environmental issues have a much higher priority.

Related to the level of public interest is the role of private interests, particularly economic interests. In general, business and industry have not actively participated in the

planning processes in terms of the air quality-land use relationship. In part this was probably due to the fact that the relationship played such a minor role and did not pose a threat to their concerns. There is some evidence, however, that with the Non-Attainment Plan certain local industries had quietly tried to scuttle the whole process in order to avoid the new source review requirements.

d) There would have been difficult technical problems with incorporating the air quality-land use relationship in the process. It would probably have been impossible to carry out sophisticated analysis of the air quality-land use relationship at this time, even if the money were available. There were big data gaps. Moreover, much of the data did not go back very far. The general plans for many areas were incomplete or too general to be usable in a simulation model. The level of expertise in the region was also limited. The general problems with integrating the land use-air quality relationship in the planning process discussed in the previous chapter are also relevant. The general complexity of the air quality problem is exacerbated in this region because of limited data and staff capabilities.

On the other hand, as seen with the Live Oak Area Plan, it was possible to utilize simplified rollback models as part of the analysis of air quality effects of land use policies. More could have been done. In the end, technical problems were more a contributing factor than a significant explanation for the minimal incorporation of the air quality-land use relationship.

e) Finally, there were serious political problems which partially explain the minimal federal influence. Most important, local governments are extremely wary of federal intrusion in their areas of jurisdiction and land use control is considered one of these prime areas. As indicated in a number of instances in the case studies, local officials would oppose an explicit federal attempt to influence local planning. Local officials tend to view the federal government with suspicion as far as land use is concerned and do not seek or welcome federal input.

Another somewhat related political problem stems from the fact that land use measures to improve air quality can, at times, create inconvenience and opposition if seriously implemented. To the extent such measures can be avoided, local decision-makers will tend to avoid them. Air quality concerns by themselves, then, would not justify a program's adoption to local officials. This may help explain why staff members found other rationale for land use programs which also would benefit air quality. Related to this is the tendency, discussed by Krier and Ursin, for decision-makers in the pollution area to take the path of least resistance in adopting policies. The greater the potential impact of the program, the greater the reluctance to implement it.

Moreover, the air quality-land use issue provides convenient excuses to local officials for not including it. It is easy for general plans not to consider air quality because it is a regional problem and it is easy for the air quality plans

not to consider land use because they are concerned with short-term programs and land use impacts will only occur over a long period of time. Politically, then, local decision-makers can justify their desire to exclude the air quality-land use relationship from the local plans.

The last political problem to be mentioned here concerns the local perception of regional agencies. This problem affects air quality plans. Although local officials may recognize that some problems, like air pollution, are regional in scope, they are still generally unwilling to grant any independent authority to regional agencies so that they may do something about the problems. As discussed earlier, regional agencies, at least in the Santa Cruz area, are fundamentally local in nature. Local governments not only control them but will also resist any regionally imposed solutions to problems. The regional agency staff, then, treads very lightly in order not to offend local governments. Since air quality issues tend to be regional and since the federal government tends to work more directly with regional agencies in the air quality area than with local agencies, this regional agency caution works against the meaningful incorporation of the air quality-land use relationship in either local or regional plans.

Overall, then the local political climate presents serious difficulties to attempts to expand federal influence directly or to include the air quality-land use relationship in the local planning process.

While the federal influence was found to be minimal in all

the cases, there were meaningful differences between them. In particular, the Live Oak Area Plan was found to be relatively more influenced by the federal concerns than the other plans. Why did this occur?

The principal explanation appears to lie in the political context of each case. The major political issues in Santa Cruz County are, and have been for the past several years, environmental protection and growth management. These issues have generated the fiercest community controversies, not only in specific cases, but in terms of general policy direction. The location, intensity and amount of development, moreover, have often been key concerns to voters in selecting local candidates. Local governing bodies and individual officials are seen generally as either pro-development or anti-development and communities as a whole are even characterized this way.

At the time in which the four planning processes took place, only the County Board of Supervisors, which approved the Live Oak Area Plan, was seen as anti-development. The Santa Cruz City Council majority was seen as moderate and generally pro-development. The make-up of the Transportation Commission was balanced by both pro-growth and anti-growth members. However, as mentioned earlier, there were significant pressures on all members to avoid conflict. The AMBAG Board of Directors was balanced somewhat as well but tended to lean much more in the pro-development direction. This was primarily due to the weight of the members from Monterey County who, in general, were more development-oriented.

There are several reasons why a local plan prepared in an anti-development political context would be more open to federal influence in the air quality area. First of all, environmental quality is a major goal and clean air is usually seen as an environmental resource which should be protected. Second, certain land use measures affecting air quality are also necessary for controlling growth. Restrictions on population growth rates is the clearest example of this. Air quality concerns, then, become another justification for implementing land use programs to limit development. Agency staff, responding to their governing bodies, will be conscious of these connections, even when the decision-makers are not.

Finally, local officials favoring environmental protection and growth management perceive the federal government as a potential ally in their efforts. At times, federal financial assistance is needed in order to implement their programs. At other times, the federal government is used as scapegoat, if the political heat becomes too great. In other words, federal requirements are offered as the reason for doing what they want to do anyway. All in all, since these local officials share the goals of the federal air quality program, they tend to welcome the federal influence on the local land use planning decisions.

In this regard, it may be helpful to consider why the Live Oak Area Plan process didn't contain a more significant consideration of the air quality-land use relationship and why one of the environmentally oriented Supervisors was, in fact, relatively

unaware of the federal concern with land use. It may well be that in those cases where policy makers are concerned with protecting the environment and limiting growth, they appreciate the benefits of clean air and don't feel the need for a detailed analysis of the air quality-land use relationship to show that the land use policies they espouse will improve air quality. On the other hand, policy makers favoring development might resist an analysis of the air quality-land use relationship because they don't want to hear something they would rather not know.

The plans, then, in terms of their air quality-land use considerations, generally reflected the political orientation of the governing body responsible for them.

There are other possible explanations of the differences between the cases, however, which also may have played some role. The Santa Cruz General Plan Revision might have included a more extensive analysis of the air quality-land use relationship, if the Air Quality Consistency Statement had come out earlier or if the EIR had been written. Time might have played a part with the Air Quality Element and Non-Attainment Plan. Both were done very rapidly and extensive analysis of the air quality-land use relationship in the time frame allowed would have been difficult. Finally, staff knowledge might have made a difference, at least in one case. The Santa Cruz planning staff had less information about air quality-land use concerns than the others.

It should be emphasized that the explanations offered here

are done so tentatively. The evidence is too incomplete and the situation too complex to offer them with certainty. It is very possible that other factors played an important role in explaining the evidence.

C. Chapter Summary and Conclusion

In this chapter the effect of the federal air quality program on local land use planning decisions was examined directly through the study of four local planning processes in Santa Cruz, California. In the terms of the analogy suggested in the first chapter, the null hypothesis, that the federal program had no effect, was "tested."

The analysis resulted in two major findings. First, while the null hypothesis was not valid and the federal air quality program has had an effect on the four planning processes, the federal influence has been minimal. In a sense, the major influence of the federal effort was to raise the general level of consciousness regarding the existence of the air quality-land use relationship. Local agencies were aware of the connection and were conscious of the fact that land use decisions affected air quality. Planning staff, particularly, was likely to talk in terms of the relationship. By and large, however, the inclusion of the air quality-land use relationship, in anything but a very general way, was minimal. This finding was consistent with the results of the surveys described in the first section of the chapter.

A number of possible explanations were suggested for the limited federal influence. These included the non-crisis nature

of the problem, the lack of public interest, the minimal federal requirements, technical limitations, and a number of serious political problems.

The second finding of the analysis was that, while the federal influence was minimal in all cases, it was somewhat greater in the case of the Live Oak Area Plan. Possible explanations were also presented to account for this finding. The local political climate in terms of the attitude toward the environment and population growth was seen as the most significant factor. An environmentally-sensitive, anti-development orientation appeared to offer the best local political climate for the federal air quality program to affect local land use planning decisions. In general, local political attitudes, whether positive or negative, played a major role in determining the extent of federal influence.

The case study analysis, however, did not just provide evidence on the extent of federal influence on local land use planning decisions. It is also possible to draw conclusions regarding the ways the federal program was able to influence the local decisions. The federal influence took a number of forms including the following:

1. <u>The federal law</u> - The Clean Air Act and its Amendments, in fact, determine the basic framework for considering air quality concerns at the local level. Not only does it specifically govern the context of the air quality planning carried out locally but, perhaps more important, it provides a legal legitimacy to the entire

air quality issue. Local officials must seriously consider air quality concerns if there is a local problem because it is the law and it is their duty to obey the law.

2. Federal regulatory standards - Though related to the first factor, federal standards are significant separately because they are something against which the local effort can be measured. The federal standards were mentioned in both general plan processes. Staff, particularly, is aware of them. The required standards provide the opportunity not only to see how well the local area is doing in terms of the problem but also puts some pressure on the local level to consider all possible control measures, including land use, in attempting to achieve the standards.
3. Conferences and written material - The federal effort to inform local staff particularly has been an important mechanism for expanding its influence. While it has been effective in terms of the heightened consciousness of the existence of the air quality-land use relationship, it has also been severely limited due to the complexity of the problem and the need for substantial money and expertise to implement it at the local level.
4. Money - Money is probably the most common form of federal influence but, in fact, played a surprisingly minor role in the planning processes studied here.

The expression of federal influence occurred through a number of channels, which included the following:

1. To a considerable extent federal concerns in the air quality area pass through State and regional agencies before being delivered to local governments. In fact, the City of Santa Cruz staff member interviewed indicated that he received all his information on the federal air quality program from regional agencies. The obvious reason this occurs is because the State and regional agencies are thought to be closer to the local level. On the other hand, a filtering out process seems to occur as well. The agencies along the line decide what is relevant and, in the end, a good deal of information which may be important to the federal government does not get through. It appears that federal information on the air quality-land use relationship, for example, was filtered out before it reached the City of Santa Cruz staff despite the federal policy to encourage the incorporation of air quality concerns in local general plans.
2. The direct meeting provides a useful channel for federal influence. At meetings, federal staff can explain their concerns and make available relevant information. EPA, however, participated directly only in the Non-Attainment Plan process and then only occasionally. Limited staff availability undoubtedly accounts for this. However, even at the times EPA did meet

with local staff and officials, they did not discuss the air quality-land use relationship or encourage the adoption of land use measures to improve air quality. They seemed concerned more to minimize the possible local opposition to federal intrusions. The one time the role of population projections was raised, it was in the context of telling local officials they had complete choice over the control strategies in the plan as long as the standards were met. The desire to minimize conflict, then, seemed to have taken precedent over any concern for the air quality-land use relationship.

3. The air quality planning process itself was potentially an important channel for effecting local land use planning decisions. However, the fact that the air quality planning processes were required did not mean necessarily that the federal concern with the air quality-land use relationship would be included and, in actuality, it was not to any great extent. The air quality plans, then, were of only minor importance as a channel of influence. On the other hand, they did provide a mechanism for spreading the awareness of the existence of an air quality-land use relationship to local governments and of some land use measures which affected air quality. The likelihood of local agencies incorporating those measures, though, simply because they were mentioned in the plans is doubtful.

THE CASE STUDIES

Notes

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CONCLUSION

A. Introduction

The purpose of this thesis was to explore the effects of the federal air quality program on local land use planning decisions. In doing this, the study ranged over a number of topics broader than the one of major concern here yet clearly related to it.

In this final chapter, reflections on some of the conclusions and implications from the previous material will be presented. The major themes and concerns will also be more closely tied together.

The issue of federal influence on local land use planning decisions has been a controversial one over the last several years. On the one hand, local governments have complained that their authority to control land use was being seriously eroded by state and federal intrusions. Federal intervention was seen as occurring mainly through the air and water quality programs, though concerns about proposed national land use legislation were also expressed.

On the other hand, so-called environmentalists welcomed the increased federal and state involvement in local land use matters and, in fact, actively lobbied for it. They saw local government as either incapable of, or unwilling to, prevent serious environmental degradation and believed that a more active federal influence would not only lead to increased

environmental protection but to a strengthened local planning process as well.

A major conclusion of this study is that those fearing a federal takeover of local land use decisions have little to worry about, at least as far as the federal air quality program is concerned. The findings of the four case studies indicated that federal influence on local land use planning decisions was, by and large, minimal. In most cases the federal concern had resulted in little more than a consciousness of the air quality-land use relationship and of the existence of certain land use measures which might affect air quality.

Although this finding is generally consistent with the other surveys of the inclusion of air quality concerns in the local land use planning process, caution should be exercised before generalizing the results to other areas. Santa Cruz, California does not currently have a really serious air pollution problem. The air quality deterioration is far less than what exists in many major metropolitan areas even though federal standards are being violated and the county is experiencing rapid population growth. On the other hand, since most of the factors which appear to have influenced the process in Santa Cruz are not unique to this area, it would not be surprising if similar results were also found elsewhere.

B. Factors Affecting Federal Influence

The evidence from the case studies and the information presented in the earlier chapters indicate that, generally, the ability of the federal air quality program to affect local

land use planning decisions is constrained and itself affected in significant ways by a large number of factors. However, the following conclusions regarding the federal-local interaction are based solely on the analysis of the air quality program and it is not intended that they should be generalized to other program areas.

1. The Federal System

The essence of American federalism is the diffusion of power. Power is shared not only between governmental levels but also within each separate level. The authority of the federal government is limited constitutionally and, because the federal powers in it are specifically enumerated, any expansion by the federal government into a new area is subject to challenge. When EPA attempted to implement the 1970 Clean Air Act Amendments by requiring states and localities to enforce federal air quality plans, they were resisted on the basis of having violated the constitution's separation of powers provisions. The constitution itself, then, can be used to constrain the federal ability to influence local government, especially when a new issue area, like land use control, is involved and when there is widespread local opposition.

In fact, extensive intervention by the federal government was attempted in the case of air pollution only after the seriousness of the problem had been generally recognized and the state and local governmental levels were seen as clearly unable to solve it. The expansion of federal influence over local governments was justified on the basis of the public

health dangers which, it was argued, only the federal government was capable of eliminating. The federal government, then, had to make a strong case in order to overcome the built-in resistance to expansions of federal power within the federal system.

Moreover, until 1970, local governments encouraged federal participation in the air quality area and welcomed federal political and financial assistance. To a large extent, localities were overwhelmed by the problem and recognized their own ineffectiveness. The major expansion of federal involvement clearly took the responsibility for solving the problem from local governments and put it on the federal shoulders. Although governmental activity was expanding at all levels, the federal government became identified as the prime mover.

Another factor which might have contributed to the early local support for federal intervention can be traced to the attitude of city-states during the Italian renaissance. When one of them was forced to become indebted to another, it almost invariably chose a power far from itself--one for whom it would be inconvenient or difficult to take advantage from that indebtedness. So in the struggle for power in this country, local governments are more comfortable asking help from a federal government perceived as "far away" than from the more immediately threatening state level. This is probably more true in California than the East Coast.*

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*I am grateful to Michealangelo Rosato for suggesting this point.

Local attitudes changed, however, when the federal government "came too close" and "went too far" and the stiff resistance succeeded in cutting back the federal program.

The nature of the federal system also affected the manner in which the federal government attempted to implement the air quality program. The executive branch, first HEW and then EPA, proceeded cautiously wherever possible. In the 1950's and 1960's there was a great reluctance to intervene too strongly due to fears of antagonizing state and local governments. Even after the passage of the 1970 Amendments and the congressional demand that the problem be solved within eight years, EPA proceeded slowly. Particularly in areas, such as land use, which were generally perceived of as within the domain of local government, EPA hesitated to enter. In part, this was undoubtedly due to the fact that the federal officials responsible for implementing the Act knew they would bear the brunt of local criticism. They also interacted on a regular basis with local agencies and recognized the importance of cooperation. In fact, given the limited amount of federal manpower available, they knew that local assistance was critical for a strong air quality program to be possible. They therefore tried to tread lightly in those areas of potential conflict.

The hesitancy of the federal government to aggressively implement the Clean Air Act and the ability of local governments to successfully resist federal enforcement efforts raise questions as to the viability of American federalism. Can

the major problems of our society be resolved in a system where power is so diffused and there are so many opportunities to undermine governmental effectiveness? These questions are particularly difficult to answer as far as air quality is concenred. On the one hand, if governmental power was more centralized at the federal level, it may have been possible to solve the problem of air pollution as rapidly as Congress envisioned. Transportation control measures, indirect source review, and direct land use control measures would have been more easily implemented. In fact, since central planning, in general, would be stronger under such a system, it can be argued that air pollution would not have been permitted to become as large a problem as it had. On the other hand, the limitations placed on governmental power by the federal system may have prevented serious governmental excesses and mistakes. The ability of land use measures to improve air quality has not yet been well documented. Moreover, even the transportation control measures proposed do not appear, at this time, to have major impacts on air pollution concentrations. More aggressive implementation of these measures may have led to extreme social disruption with little benefit to air quality. Moreover, some have argued that the existing federal air quality program is more aggressive than existing knowledge justifies. Standards are too strict and deadlines too rigid. Rather than extend federal influence, it may be possible and desirable to solve the problem with a reduced federal effort. Finally, still another perspective would suggest that the

federal system did not unreasonably restrain the federal air quality program. If the federal government had wished to more aggressively pursue its goals, it could have done so. The administration's hesitancy in implementing the program was based on political factors or, perhaps on the recognition that knowledge was limited and the problem very complicated to solve. While it is true, then, that the federal system constrains the power of the federal government, it is not clear, as far as the air quality program is concerned, whether this has been to good or bad effect or even whether the limits of federal influence were reached.

A final point. The federal government has implemented a number of programs which have imposed extensive requirements on local governments. In a number of cases, these programs have not met with significant local resistance. While it has not been possible to compare a range of federal initiatives for their effects on local government in this thesis, it is possible that a more affirmative federal approach would have avoided local opposition. On the other hand, whether this could have been done without sacrificing the federal air quality goals established by Congress is questionable.

2. The Air Quality Program

The federal air quality program itself in certain respects acted as a constraint on federal influence over local land use planning decisions. Originally the air pollution problem was defined in terms of stationary sources, mainly industry. The first federal enforcement efforts were directed at industrial

polluters. During the 1960's the emphasis shifted to the automobile as the major pollution source, at least in many communities. At first, as with industry, the solutions to the problem were seen solely in technological terms.

By 1970 there was a strong feeling, which received congressional support, that technological solutions would not be sufficient. In order to provide clean air, changes in people's travel habits were also necessary. Included in the 1970 Act, therefore, was the requirement that transportation and land use control measures be implemented, where necessary. The message, then, of the federal program in 1970 was that land use measures were potentially a meaningful component of an area's air quality control efforts. However, although this appeared to be the congressional intent and it was backed up by early court decisions, EPA acted as reluctantly and cautiously as it could. Court cases compelled the federal activities in the land use area.

Local and state governments, on their side, while welcoming federal control efforts as far as industrial polluters were concerned, strongly resisted federal expansion into the land use area. Around 1974, with the defeat in congress of the indirect source review program, the federal program began to back away from a strong position on land use matters. At most, the consideration of land use controls in local land use plans was to be encouraged and the Air Quality Maintenance Plans required consideration of growth projections.

With the 1977 Amendments, local and state governments

were given even more say over control strategies and, while population projections had to be included in non-attainment plans, little actual emphasis was put on them. In response to local pressures, then, the federal program's interest in promoting consideration of land use measures to improve air quality was reduced. While the federal concern with the air quality-land use relationship remains, it is significantly less than it was several years ago.

A further indication of the lack of a deep federal concern to affect local land use planning decisions is the fact that air quality maintenance strategies are not emphasized as part of the non-attainment planning process. The non-attainment plans are still geared to the attainment of the air quality standards and there has been no serious attempt to have the maintenance of the standards integrated into the process. Since most land use measures have impacts only over the long term, a maintenance perspective is needed in order to consider land use as a relevant part of the air quality planning process. The fact that such a perspective is not being pushed by EPA allows a local non-attainment plan, like the one considered here, to include land use measures in the most general way and essentially ignore them.

The overall federal air quality program, then, is primarily concerned with the meeting of the air quality standards. While land use measures are thought to be a potentially viable strategy to help achieve the standards, they occupy a position of relatively low priority. The limited commitment of the

federal air quality program, itself, to affect local land use planning decisions, then, has been a significant factor in minimizing its impact.

In part, this priority is due to the fact that there is still much debate regarding the potential effectiveness of land use measures and of technology in solving the air quality problem. Certainly technology still is regarded as playing the major role. In fact, it may be possible in the long run, and it certainly would cause less social disruption for technology to provide clean air by itself. To this point most of the improvements which have occurred have been due to technological innovations and, in large part, this is expected to continue into the future. On the other hand, not only may technology have its own limits but, probably more important, technology is applied by people and a theoretically viable technological innovation may fail if misapplied. Emission control devices on automobiles are an example of this possible problem. These devices are projected to have a major impact on air quality over the next ten years. Yet unless these devices are maintained they will cease to be effective and it is still unclear whether successful inspection and maintenance programs will be established. It may be possible, then, that in the long run land use measures for achieving air quality will be both more effective and less expensive than technological controls.

The cost problem is directly related to the role of technology. Probably the major criticisms of the federal air

quality program have centered around its cost implications for both the private sector and local governments. The federal government has been accused of imposing expensive programs while being unwilling to pay for them. Although the actual cost/benefit effects of the federal program have not been adequately determined to any great extent, a comment on the way the costs are imposed is in order. Industry has long argued that the costs government imposes on it are eventually passed on to the consumer. This point is essentially correct and it is, therefore, possible to look at these controls as a form of use tax set by the government. The arguments for and against indirect taxation cannot be considered here, but to some extent this form of taxation is used in this country and extensively elsewhere. Unlike most taxes though, it is much easier to directly relate the specific price to the specific public benefit. Further, since the decision to impose these "taxes" occurs in the public arena at least as much as with other taxation decisions, there is nothing procedurely illegitimate about the fact that the federal requirements impose costs indirectly.

3. Local Interrelationships

General purpose local governments exist within a complex, ever-changing web of intergovernmental relationships and an understanding of the dynamics of these relationships can help explain the impact of the federal air quality on local land use planning decisions.

Local government officials are primarily reactive in the

way they function and usually respond to issues brought before them. They are extremely busy, particularly since, in most cases, they serve on a number of local and regional agencies. They also tend to be crisis-oriented. They are generally most involved in the concerns of their local constituencies and locally defined problems. In an area like Santa Cruz where the issues are rapid growth, the high cost of housing, and unemployment, concern with air quality is largely peripheral. Even if decision-makers recognize the future danger of air quality deterioration, their major emphasis is elsewhere.

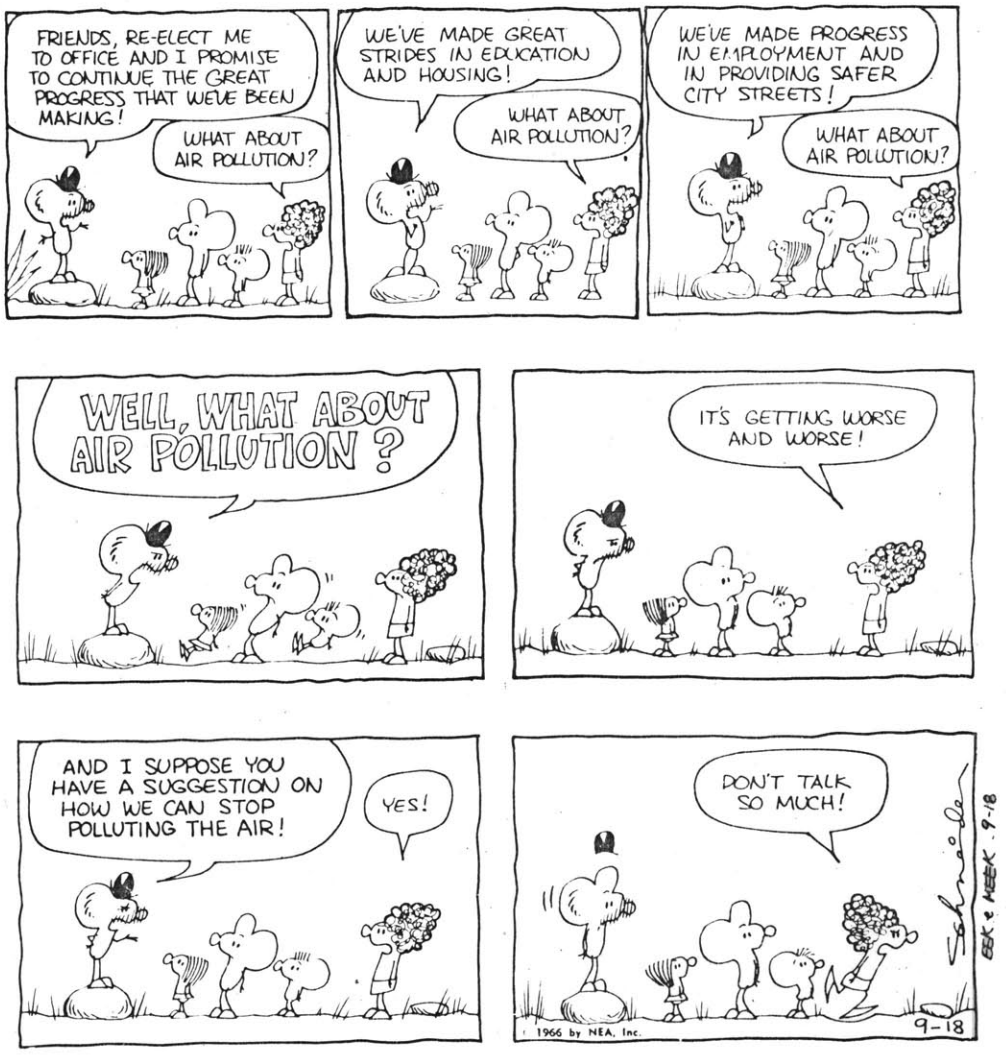
Local officials also have a strong sense of their areas of jurisdiction. In part, this is caused by the fact that these areas are limited and constrained. Much of what local governments do is mandated by either the federal or state governments. Land use is the area where localities have traditionally exercised their greatest autonomy and they strongly resent attempts by other governmental levels to encroach in this area, if only because they need to feel that they have some power somewhere. They, also, believe that they understand best the local situation and are best able to respond to local needs. In part, though, the local resentment is a consequence of the political climate. Often, local officials are responding to powerful private interests in the community and will support their resistance to outside controls. This helps to explain why, when the local leadership shares the perspective of the federal or state programs, they will not actively oppose outside intervention. The case studies considered

contained evidence of both kinds of responses.

In addition, local governments also have a strong conservative tendency. They generally prefer to move cautiously and avoid controversy. This desire to avoid controversy probably underlies much of the local resistance to including strong land use measures affecting air quality in local plans. To the extent these measures will cause inconvenience and dislocation to local citizens, there is great reluctance to adopt them. In a sense, local officials resist these programs because of the belief that they, and not the federal government, will end up bearing the brunt of the criticism for helping to achieve the federal goals. Local governments, then, without a strong outside push, would generally be unwilling to initiate or incorporate a new local effort that would cause controversy.

Directly related to this is the role of public action. While local governments will generally not initiate controversy, they have to respond to it. Widespread, active public concern with an issue will usually lead to at least a serious consideration of it by the public agency. Air quality, in Santa Cruz anyway, did not generate the necessary public interest to require a meaningful governmental response. Concern with air quality existed at a general level but the major citizen energy was focused elsewhere.

Local governments have a number of mechanisms at their disposal for resisting unwanted federal intrusions. The success of these strategies depends to a large extent on the



Source: U.S. HEW, No Laughing Matter.

strength of the federal commitment. Complaining is a common initial strategy which, if done by a large number of local bodies, can be quite effective. A second strategy is for local governments to ignore requirements in hopes of avoiding them. This occurred in the case of the non-attainment plan when EPA required that .14 ppm be taken as the second highest oxidant violation and the plan used .12 ppm. Often a program is so complex and the federal government is so reluctant to get into a fight, that this strategy will succeed. A more common strategy is to incorporate the federal concerns but in a meaningless way. The consideration of land use measures in the non-attainment plan is an example of this.

A fourth local strategy is negotiation. Usually, this will be a staff function but, at times, local decision-makers get involved as well. Meetings between federal and local people are held and an attempt is made to work out the differences. The negotiations may be protracted and it is not unusual for the locals to threaten federal officials with more dire action if they do not relent. The most extreme strategy is to fight. The federal demands are attacked by local officials in the press, the local congressional representative is called in, public support from other local agencies is solicted. Cooperation from statewide and national organizations of local officials is also sought. Finally, a lawsuit might be initiated. This strategy can usually put a tremendous amount of pressure on the federal government and, if the localities feel strongly enough about the issue and if they are united in

opposing the federal intrusion, they generally succeed.

All these strategies were used at one time or another in response to the federal air quality program, although the battle over the indirect source review was probably the worst federal-local confrontation involving land use measures. The federal government lost the battle and afterwards retreated and reduced its requirements.

A recent example of a successful local strategy in California in terms of the State government was the passage of legislation prohibiting the ARB from changing the non-attainment plans thus far promulgated in the regions. The particular concerns of the local government and business interests which lobbied for this legislation was that the ARB would require stricter land use and transportation measures than had been approved locally.

On the other hand, as the case studies showed, local governments are not necessarily unanimous in opposing federally required land use measures to improve air quality. In those areas where the local officials support environmental protection, a strong federal program could help implement local goals. The point here, though, is that effective local strategies exist for opposing unwanted federal influence and, moreover, in the air quality/land use area the federal government is extremely wary of local resistance.

The staff of local agencies also play an important role in terms of the federal influence on local land use planning decisions. To a large extent, the local staff interpret the

federal program to local officials. Since they generally draft the plans, they also determine the context in which the major issues will be considered. If local staff want the air quality-land use relationship included, they can recommend that the relationship be studied and that meaningful land use measures affecting air quality be adopted. In most of the cases studied here, staff did not emphasize the air quality-land use relationship. Staff was not willing to risk angering their governing body by going further than they thought the local officials were willing to go. To a large extent, then, the knowledge on the air quality-land use relationship which did exist was filtered out by staff and not even brought to public attention. In general, staff tended to reflect the political positions of their governing body rather than attempting to guide them or, even, inform them.

4. The Role of the States

While this thesis has concentrated on the federal-local relationship, it should not be forgotten that state governments also have played a major part in the effort to control air pollution. They first authorized local actions in the air quality area and they set the legislative limits to what the local governments could do. In fact, local frustration with state efforts to combat pollution probably led to the early local support for increased federal intervention. State programs also substantially affected the federal program. For example, Krier and Ursin argued that the federal program until 1970 was essentially modelled after the California program.

Moreover, in terms of land use, the California program during the 1970's had, to some extent at least, an independent interest in including the air quality-land use relationship in the local planning process.

The consequence of these observations is that much of what has been portrayed here as the federal influence on the local land use planning process may, to some degree, be due to independent state influence. Especially in California, it is difficult to clearly separate the state and federal programs. Though this might limit the extent to which the findings can be attributed to federal influence, it does not negate the federal effect. The 1970 Amendments specifically included land use controls and the courts expanded the need to consider them. The federal government sponsored most of the research on the air quality-land use relationship and on the development of procedures for incorporating air quality concerns in the local planning process. Federal concern with land use measures is also written into the air quality regulations. It is likely then, that local awareness and consideration of the air quality-land use relationship is at least due in part to federal influence. Further, it is also likely that the state activity in this area resulted, at least partially, from the federal program.

5. Complexity of the Issue

The complexities of the air quality problem and of the air quality-land use relationship also constrained the ability of the federal program to influence local land use planning

decisions. These complexities make the reluctance of local governments to seriously attempt to incorporate the air quality-land use relationship into their planning process more understandable. As a minimum, it gives them a good excuse for not doing so. What is particularly needed and the lack of which makes it difficult for even those wanting to incorporate air quality concerns to do so is a clear formula relating land use activities directly to air quality deterioration. The limited information available and the complexity of the relationship make it impossible to clearly show both local decision-makers and the public what the results of implementing alternative land use programs will be. The purported air quality-land use relationship, then, remains somewhat unreal in people's minds. They can understand that it exists but are unsure of what it really means in terms of the effects of local decisions.

The complexity of the air quality issue points to another limitation on federal influence and governmental effectiveness in general. With the 1970 Amendments, the federal government committed itself to providing clean air to the nation within eight years and on this basis justified a major expansion of federal power. The problem, however, did not lend itself to any easy solution even with a major federal effort. There were too many complex technological, economic and political issues which could not be resolved. The federal promise, then, was not fulfilled.

Pressman and Wildawsky in their study entitled Implementa-

tion describe some of the difficulties implementing a federal grants program under the Economic Development Administration.[1] Even with the local agencies publicly committed to achieving the federal goals, the program did not succeed. In the case of air quality, where the federal government used the regulatory rather than the monetary approach and where local governments strongly resisted certain aspects of the program, even greater difficulties during the implementation process could have been expected.

One of the major problems described in Implementation concerns the tendency by government to bite off more than it can chew. In Oakland, the federal government promised to end local unemployment. In this case, the federal government promised to provide clean air. The problems, however, did lend themselves to rapid governmental solutions. Other interests not under the control of government, played an important part. Moreover, to some extent, the attempt to solve one problem creates other problems. As Babcock and Callies said in another context: "Any beneficent public policy, if prosecuted vigorously, is bound to conflict with an equally beneficent public policy."[2] The point here is that governmental policy based on guaranteeing solutions to major societal problems is likely to be unsuccessful.

C. The Extent of Federal Influence

In light of the factors discussed in the previous section, it is not surprising that the federal effect on local land use planning was found to be minimal. The fact that the overall

impact has been minor does not mean, however, that it should be ignored. There has been a federal influence and there is a chance for it to expand.

Both general plans examined in the case studies indicated an awareness of the federal air quality program at least to the extent of recognizing the federal standards and understanding that it was necessary to attain them. While the plans did not go much beyond this, the federal government was identified as a legitimate actor. Further, there was a general awareness by the participants in all four planning processes that land use decisions potentially affect air quality. While the relationship may not be well understood or even incorporated meaningfully in the plans, the federal program has raised the overall level of consciousness and has set the stage for further activity in this area, if it is desired. Finally, at least among the planning staff, there was knowledge of the common sense land use measures which had been cited in the literature as beneficial to air quality.

On the other hand, little analysis of the potential effects of the land use measures in the particular local context was carried out. There was also no consideration of the possible negative impacts of these measures, discussed in Chapter II, on air quality. In fact, the local plans as a whole contained no analysis of their potentially negative air quality impacts. For the City of Santa Cruz General Plan Revision some such impacts were likely. In addition, there was no use of the planning procedures outlined in Chapter II for incorporating

air quality concerns in the local planning process. Moreover, in most cases, the inclusion of land use measures affecting air quality was probably not motivated by air quality concerns. At best, air quality served as a partial rationale for their incorporation. In many instances the land use measures were recommended for totally other reasons. With the air quality plans, the land use measures were neither direct, area-specific or enforceable and did little more than provide a rhetoric of concern.

In conclusion, then, the federal influence was minimal but did create a general awareness of the connection between air quality and land use. The likelihood of local land use plans incorporating air quality concerns in a meaningful way is still small and, as evidenced by the 1977 Amendments, probably diminishing. This is true whether the plans are local or regional, land use or air quality.

On the other hand, the case studies did identify significant local differences. The Live Oak Area Plan considered air quality concerns more seriously than was done in the other plans. The political make-up of the governing body appeared to be the key variable explaining the differences. Where local officials are concerned with environmental protection and are seeking to control their area's growth and protect its resources, there is a greater probability that federal influence will occur. The local agencies may even welcome federal intervention. The conclusion, then, is that if air quality is incorporated into local land use plans in a meaningful way,

it will happen at the behest of local governments.

D. Suggestions

A key question that has not been resolved in this thesis is whether land use planning should be utilized to improve air quality. The information from Chapter II indicated that, while the intuitive response may be positive, the issue is extremely complex and a definitive answer is not possible. As mentioned earlier, technological programs could eventually provide sufficient control to meet the federal standards. Assuming however, that air pollution problems will continue to grow with increased population, despite technological and transportation control measures, land use measures including land use planning could provide necessary long term assistance.

If this is so, how then might air quality considerations be more effectively incorporated into local land use planning decisions? An obvious first step is for the federal will to become stronger. This will, however, is related to the likelihood of success and this, in turn, depends, in part, on developing a program which will not cause widespread opposition from local governments.

One suggestion for such a program is based on California legislation which proposed an air quality element as part of local general plans. This approach was rejected in California primarily because air quality was identified as a regional problem requiring a regional solution. It may make sense, however, to reconsider this analysis and recommendation.

The federal and state air quality planning efforts have

focused on the regional level. Air quality determinations were based on conditions throughout the basin, so a regional perspective was seen as necessary. Also, there has been a long term interest by the federal government as well as numerous observers in strengthening regional government as a way of overcoming the problems of local government fragmentation. The California consultants, then, advocated for a regional solution for incorporating the air quality-land use relationship at the local level and developed the previously described Emissions Allocation Planning (EAP) procedure for carrying it out.

There are a number of reasons why this approach was unworkable. First of all, as was mentioned earlier, local governments are extremely suspicious of investing independent authority in regional agencies, especially when it overlaps areas of their concern and, therefore, strongly resisted granting regional agencies control over a planning process requiring the inclusion of air quality considerations in local general plans. In addition, general purpose local governments are the key land use decision-makers and are most likely to remain so into the future. If air quality is to be incorporated into the local land use planning decisions, local governments will need to play a central role.

Another problem with the regional approach recommended in California is that it was too comprehensive. It attempted to solve the problem of incorporating the air quality-land use relationship into the local planning process in one fell swoop.

It tried to do everything at once and, because this would obviously create certain political difficulties, potential supporters were frightened off. In an area as touchy as land use where local agencies are so jealous of their authority, a more cautious approach is needed.

Such an approach might have been possible with the requirement for a local air quality element. While local governments were not enamored with state requirements to prepare a variety of general plan elements, they were not overly upset, could understand the potential value, and appreciated the fact that they were responsible for the preparation and adoption. State requirements for a Seismic Safety Element and Noise Element, for example, were accepted at the local level.

A local air quality element could function as a first step in the longer term process of meaningfully incorporating the air quality-land use relationship into the local planning process. It would not be necessary to require that local plans show how the federal standards would be met. Rather, the thrust could be towards a serious consideration of the potential air quality impacts of the general plan and an attempt to minimize air pollution through the plan. The implementation guidelines could require, for example, that the air quality element seek to determine the current level of emissions within the jurisdiction, estimate long term emissions resulting from the general plan, particularly evaluate emissions of proposed land use programs, and, as a minimum, relate land use policies to air quality impacts. Obviously, it would not be easy for

localities to prepare all the necessary information by themselves and regional agencies could be designated to assist localities in their analysis. There would be no requirement that any particular policies or programs be adopted or that future emissions be limited.

An air quality element with these guidelines would have a number of significant benefits. It would compel local governments to consider the air quality issue seriously and would increase their awareness of the air quality-land use relationship. It would provide an easy channel for transmitting information on the relationship to local governments. The larger ones, especially, would actively seek techniques for analyzing the air quality impacts of their plans. The air quality element would also encourage regional-local cooperation, as local governments would turn to regional agencies for necessary statistics and assistance with the technical analysis. Moreover, the local elements, when completed, would provide a framework for the future allocation of emissions to jurisdictions where air quality conditions in the basin made it necessary. The state could make the allocations, hopefully based on local recommendations. The need for these allocations and the potential changes in land use programs resulting from them would be better understood as a result of the experience with the elements. Finally, the air quality element procedure recognizes the realities of intergovernmental power. The state is far more able to place requirements on local governments than any regional agency and the central role accorded local

governments in the process would probably minimize their resistance.

A local air quality element, then, could provide for the beginnings of a serious incorporation of the air quality-land use relationship in the local land use planning process. It is not without its difficulties, however. First of all, the federal government would not be able to require the preparation of such an element directly. It would be necessary to get the states to do it. EPA could negotiate with the states to include the requirement for an air quality element in the State Implementation Plan (SIP) at least for those areas with violations as part of a maintenance strategy. Even if the states want to require air quality elements, however, there would be another serious problem. The preparation of the elements is likely to be expensive, especially if an extensive technical analysis is undertaken. In the early 1970's, local governments in California were willing to bear the expense of preparing the State mandated elements with only moderate complaints. In the post-Proposition 13 era, there is no way the State could impose this requirement without paying for it. Given the fact that it would be a substantial expense on a statewide level, it is unlikely that the states would be willing to provide the funding. Therefore, unless the federal government is willing to pick up the tab, this suggestion is not viable. The HUD 701 program, however, could serve as a potential funding source.

A final problem with this proposal is that, even if local air quality elements are prepared, the subsequent step of

allocating future emissions to the localities and requiring that local plans not provide for exceeding these emissions would be very difficult to carry out. The states would have to exercise substantial political muscle and the federal commitment would also have to be strong. Even with these, it might not be possible to make the hard political decisions. While this is a limitation with the proposal, it does not negate many of its benefits. The incorporation of air quality concerns in the local land use planning process would undoubtedly be significantly more meaningful than it is currently.

A second general suggestion concerns the approach EPA will use to implement the 1977 Clean Air Act Amendments. On the one hand, greater flexibility on EPA's part is necessary. In this regard, it probably makes sense to raise the oxidant standard slightly to .10 ppm, the point at which eye irritation is experienced. More importantly, the level of violation which non-attainment plans must correct should be redefined. At this time, the second highest violation in an air basin is used as the measure to be reduced. It would probably be adequate and also more realistic to require that the necessary reductions be determined using a percentage of days in which violations occurred rather than the second most extreme case. For example, a non-attainment plan would be required if violations occurred on 3 percent of the days in a year with the amount of reduction required based on the average of the violations. Finally, EPA should propose a special schedule for attaining the air quality standards in areas with

the most extreme air pollution problem, such as Los Angeles. Attempting to compel these areas to meet the standards under the deadlines in the Act is unrealistic and makes the federal program look foolish.

On the other hand, while greater flexibility in applying the Act is desirable, EPA should also be strict in other areas. The non-attainment plans which EPA must approve by July 1979 should show attainment at least by 1987 or not be approved. Local governments should not be let off the hook and, if necessary, sanctions should be imposed. Further, regulations for the inclusion of maintenance strategies in non-attainment plans should be promulgated. These should attempt to tie air quality concerns more directly to the local land use planning process. In addition, the current emphasis on population projections should be expanded. At least it should be required that the consequences of these projections on local land use planning decisions be made explicit in the air quality plans. In some areas restricting the provision of sewer grants on the basis of population projections will be very effective and should be continued. In other areas, like Santa Cruz, where previous decisions provided facilities with capacities far in excess of current needs, other measures may be necessary. Finally, in non-attainment areas, the population projections should be converted into annual growth rates and monitored to assure that the projections will not be exceeded. Where the rates are exceeded, EPA should impose sanctions if local governments refuse to act in conformity with their plans.

One consequence of these suggestions would probably be to eliminate Santa Cruz as a non-attainment area. However, sufficient protection against future serious air quality deterioration would be provided, there would be greater assurance that the goals of the necessary non-attainment plans would be achieved, and the likelihood of relating land use activities to air quality concerns in a meaningful way would be enhanced.

E. Final Comments

As mentioned in the introductory chapter, this thesis was in part motivated by the expectation that it would substantiate a number of initial assumptions regarding the air quality problem. However, this did not occur. The process of preparing this thesis became a process of growing uncertainty. What seemed simple became extremely complicated. The local air quality problem is not as bad as it first appeared and its future importance is unclear. The role of land use in alleviating the air quality problem is uncertain. It is not only difficult to understand the significance of land use measures but also how to effectuate them successfully. The federal interest in land use is not as strong as expected. Philosophically the air quality-land use relationship is recognized but, especially since the 1977 Amendments, there is probably not the willingness to fight for its inclusion in the local planning process. Finally, though the original characterization of the local attitude as an unwillingness to seriously consider the air quality implications of their land use decisions was,

in the main, substantiated, to some extent the local response depends on the local political climate as well as the seriousness of the problem.

The topic, after the study, seemed infinitely more complex and difficult to understand than it had at the outset. The number of questions raised far outnumbered the ones answered.

CONCLUSION

Notes

[1]Jeffrey L. Pressman and Aaron B. Wildavsky, Implementation (Berkeley: University of California Press, 1973).

[2]Richard F. Babcock and David L. Callies, "Ecology and Housing: Virtues in Conflict."

QUESTIONS FOR DECISION MAKERS:

Name _____ Date _____

Agency _____ Plan General Plans

1. Do you think land use controls can help achieve clean air?

Yes _____ No _____

2. Do you think land use policies will be necessary to either achieve clean air or maintain it in the future?

Yes _____ No _____

2a. If yes, what kind of land use programs will be needed?

3. Have you read any material or attended any training programs relating clean air and land use?

Yes _____ No _____

3a. If yes, specify source or sources?

4. Are you aware of the federal air quality program?

Yes _____ No _____

4a. If yes, how important do you think it is locally?

Minor _____ Moderate _____ Major _____

4b. Why?

5. In your opinion, did the federal air quality program have an impact on the planning process?

Yes _____ No _____

5a. If yes, what was it?

6. Were air quality concerns discussed during the planning process?

Yes _____ No _____

6a. If yes, what points were made?

7. Was the federal air quality program discussed during the planning process?

Yes _____ No _____

7a. If yes, what points were made?

QUESTIONS FOR STAFF:

Name _____ Date _____

Dept._____ Plan General Plans

1. Were air quality concerns considered as part of the planning process?

Yes _____ No _____

2. How much importance was given to them vis a vis other concerns?

Minor _____ Moderate _____ Major _____

3. Was a technical analysis undertaken to determine the impact of the alternative plans on air quality?

Yes _____ No _____

3a. If yes, how extensive was the analysis?

Minor _____ Moderate _____ Major _____

Discuss:

3b. If no, why not?

4. Did staff recommend air quality policies for the plan?

Yes _____ No _____

4a. If yes, how were the policies decided upon? What level of specificity was discussed?

4b. If no, why not?

5. Did staff recommend specific programs related to air quality for inclusion in the plan?

Yes _____ No _____

5a. If yes, how did staff learn about the programs?

5b. If yes, how much importance was placed on the program's inclusion in the plan?

5c. If yes, what kind of impact was anticipated on air quality as a result of the program?

5d. If no, why not?

5e. If no, is staff aware of specific land use programs that affect air quality?

Yes _____ No _____

6. Was air quality an important consideration by the public in the planning process?

Yes _____ No _____

7. How many comments were received from the public concerned with air quality?

None _____ Few _____ Many _____

8. Did any public comments recommend specific programs or mention the federal standards?

Yes _____ No _____

9. Did special interest groups mention air quality concerns?

Yes _____ No _____

9a. If yes, how extensive was their concern?

10. In your opinion, should land use controls play an important part in improving air quality?

Yes _____ No _____

10a. Why?

11. Has staff received information/material relating land use and air quality over the last four years?

Yes _____ No _____

11a. If yes, what was the source or sources?

11b. If yes, was it an extensive amount?

11c. If yes, to what extent was the attempt made to integrate the information into the planning process?

12. Has staff attended any training programs relating land use to air quality?

Yes _____ No _____

12a. If yes, who sponsored the training?

12b. If yes, what impact did the training have on the planning process?

13. Is staff aware of the federal air quality program?

Yes _____ No _____

13a. If yes, did the federal air quality program have any relevance in the planning process?

Yes _____ No _____

13a.1. If yes, how and how much?

13a.2. If yes, what aspects of the program were involved?

13b. If yes, were federal air quality standards considered in the planning process, and to what extent?

13c. If yes, was indirect source review considered in the planning process and to what extent?

14. Did decision makers attempt to incorporate or eliminate air quality concerns during the planning process?

Yes _____ No _____

14a. If yes, explain.

QUESTIONS FOR DECISION MAKERS:

Name _____ Date _____

Agency _____ Plan Air Quality Plans

1. Do you think land use controls can help achieve clean air?

   Yes _____ No _____

2. Do you think land use policies will be necessary to either achieve clean air standards or maintain them in the future?

   Yes _____ No _____

2a. If yes, what kind of land use programs will be needed?

3. Have you read any material or attended any training programs relating clean air and land use?

   Yes _____ No _____

3a. If yes, specify source or sources.

4. Are you aware of a federal concern with the effect of land use on air quality?

   Yes _____ No _____

4a. If yes, how important has this concern been locally?

   Minor _____ Moderate _____ Major _____

4b. Why?

5. In your opinion, did land use considerations have an impact on the planning process?

   Yes _____ No _____

5a. If yes, what was it?

6. Were land use concerns discussed as part of the planning process?

   Yes _____ No _____

6a. If yes, what points were made?

7. Was a federal requirement to consider land use concerns discussed as part of the planning process?

Yes _____ No _____

7a. If yes, what points were made?

QUESTIONS FOR STAFF:

Name _____ Date _____

Dept. _____ Plan Air Quality Plans

1. Were land use concerns considered as part of the planning process?

   Yes _____ No _____

2. How much importance was given to them vis-a-vis other concerns?

   Minor _____ Moderate _____ Major _____

3. Was a technical analysis undertaken to determine the impact of the alternative land use controls on air quality?

   Yes _____ No _____

3a. If yes, how extensive was the analysis?

   Minor _____ Moderate _____ Major _____

3b. If no, why not?

4. Did staff recommend land use policies for the plan?

   Yes _____ No _____

4a. If yes, how were the policies decided upon? What level of specificity was discussed?

4b. If no, why not?

5. Did staff recommend specific programs related to land use for inclusion in the plan?

   Yes _____ No _____

5a. If yes, how did staff learn about the programs?

5b. If yes, how much importance was placed on the programs' inclusion in the plan?

5c. If yes, what kind of impact was anticipated on air quality as a result?

5d. If no, why not?

5e. If no, is staff aware of specific land use programs that affect air quality?

Yes _____ No _____

6. Was land use an important consideration by the public in the planning process?

Yes _____ No _____

7. How many comments were received from the public concerned with air quality?

None _____ Few _____ Many _____

8. Did any public comments recommend specific programs or mention the federal standards requiring land use controls?

Yes _____ No _____

9. Did special interest groups mention land use concerns?

Yes _____ No _____

9a. If yes, how extensive was their concern?

10. In your opinion, should land use controls play an important part in improving air quality?

Yes _____ No _____

10a. Why?

11. Has staff received information/material relating land use and air quality over the last four years?

Yes _____ No _____

11a. If yes, what was the source or sources?

11b. If yes, was it an extensive amount?

11c. If yes, to what extent was the attempt made to integrate the information into the planning process?

12. Has staff attended any training programs relating land use to air quality?

Yes _____ No _____

12a. If yes, who sponsored the training?

12b. If yes, what impact did the training have on the planning process?

13. Is staff aware of the federal concern with the effect of land use on air quality?

Yes _____ No _____

13a. If yes, did this concern have any relevance in the planning process?

Yes _____ No _____

13.a.1. If yes, how and how much? To what extent was it considered?

13b. If yes, was indirect source review considered in the planning process and to what extent?

14. Did decision makers attempt to incorporate or eliminate land use concerns during the planning process?

Yes _____ No _____

14a. If yes, explain.

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