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Implementing the Clean Air Act in Los Angeles: The Duty to Achieve The Impossible

Eli Chernow*

I

PASSAGE OF THE ACT

Leaders in the fight for clean air undoubtedly felt victorious when Congress passed the 1970 amendments to the Clean Air Act1 over the auto industry’s bitter opposition, for Congress had thereby established an administrative authority with unprecedented powers to implement the broad purposes of the Act.2

The Clean Air Act apparently required automakers to produce non-polluting cars by model year 1975,3 while demanding that the

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2. The Act’s purposes are as follows:
(1) 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;
(2) to initiate and accelerate a national research and development program to achieve the prevention and control of air pollution;
(3) to provide technical and financial assistance to State and local governments in connection with the development and execution of their air pollution prevention and control programs; and
(4) to encourage and assist the development and operation of regional air pollution control programs.
3. The maximum level of hydrocarbon and carbon monoxide emissions allowable in model year 1975 required at least a 90% reduction from those of model year 1970; nitrogen-oxide emissions were to be reduced by a comparable amount by model year 1976. Id. § 202(a), (b), 42 U.S.C. § 1857f-1(a), (b). The Administrator has subsequently announced that the problem of nitrogen oxide pollution may be far less pervasive than had previously been thought, and that the drastic reductions of nitrogen oxide emissions required by the Act may not be necessary to meet national air quality standards by 1977 except in a few areas. Proposed Reclassification of Air Quality Control Regions, 38 Fed. Reg. 15180 (1973). This announcement may have profound significance, and may lead to a substantial easing of the tensions surrounding the air pol-
states take any steps necessary to clean the air by that same year.\(^4\) The Act’s mandatory time table could be extended only under certain specified circumstances, and in any event by not more than three years.\(^5\) Rigorous adherence to the Act’s strict deadlines would be assured because environmentalists were explicitly granted standing to use the courts to enforce its terms. Section 304 authorized any person to commence a civil action on his own behalf against anyone violating the Act, or against the EPA Administrator for any failure on his part to perform any mandatory duty which the Act imposes upon him.\(^6\) The Act promised clean air by 1975, and virtually guaranteed it by 1978.\(^7\)

Through these and other innovative and imaginative provisions the Act promised to solve the country’s air pollution problems once and for all. We now have had several years experience with the Act, and even though the time schedule still has several years to run, it is readily apparent that the air basins plagued by severe air pollution problems in 1970 will continue to suffer long after 1975. The inadequacies of the statutory scheme were most dramatically revealed when the Administrator promulgated certain recent regulations required by the Act. The regulations complied literally with the standards set, but they contained such patent absurdities as the total curtailment of gasoline consumption in Los Angeles by 1977.\(^8\) The Administrator’s regulations in effect were requests that the Act be amended.

The Administrator’s experience demonstrates that solution of the

\(^4\) No specific date was fixed for full compliance, but the Act required performance of a sequence of events, each within specific time limits: The Administrator was required to promulgate proposed ambient air quality standards within 30 days of the effective date of the Act. Section 109(a)(1)(A), 42 U.S.C. § 1857c-4(a)(1)(A) (1970). Final standards were due within 90 days after initial publication of the proposed standards. Id. § 109(a)(1)(B), 42 U.S.C. § 1857c-4(a)(1)(B). States had nine months thereafter to submit implementation plans. Id. § 110(a)(1), 42 U.S.C. § 1857c-5(a)(1). The Administrator was required to approve or disapprove the plans within four months. Id. § 110(a)(2), 42 U.S.C. § 1857c-5(a)(2). If necessary, the Administrator was to promulgate substitute plans within six months. Id. § 110(c), 42 U.S.C. § 1857c-5(c). The plans were required to achieve compliance with the national primary standards within three years, unless an additional two-year extension was obtained. Id. §§ 110(a)(2)(A)(i), (e), 42 U.S.C. §§ 1857c-5(a)(2)(A)(i), (e). A suspension for one additional year is possible only if certain stringent conditions are satisfied. Id. § 110(f), 42 U.S.C. § 1857c-5(f).

IMPLEMENTING THE CLEAN AIR ACT

Air pollution problem requires a calculus we have not yet developed. As we shall see, attempts to solve this problem by strict regulations impose burdens that are unpredictable in nature, magnitude, and distribution. Therefore, such regulations inevitably prove to be politically unacceptable and ultimately ineffective. This Article examines implementation of this extraordinary Act in the Los Angeles metropolitan area, one of the country’s pathological cases of air pollution. It is hoped this examination will facilitate appropriate amendment of the Act and, more importantly, that it may offer some understanding of the dynamics of legislative solution to an environmental problem that is fundamentally a part of the economic and social fabric of our society.

This Article first outlines major early milestones in the attempt to implement the Act in California’s South Coast Air Basin, the Air Quality Control Region encompassing metropolitan Los Angeles. It then discusses selected problems encountered in the implementation process, as well as certain decisions made by public agencies, not in an attempt to reconstruct the actual decisionmaking process, but rather to shed light on some of the real problems facing such decisionmakers in an attempt to explain in conceptual terms why greater progress was not achieved.⁹

II

THE CLEAN AIR ACT

Although the auto emission standards of Title II received more attention during the congressional debates, the innovations of Title I were far more remarkable. Title I called for a joint federal-state effort to combat air pollution. The initial federal role was to set ambient air quality and emission standards.¹⁰ The Administrator was directed

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⁹. This article may be viewed as an exercise in historical fiction. Unlike conventional historical fiction in which passions and base motivations are attributed to historical characters, in this article rationality is attributed to public officials.

Since the saga of implementing the Clean Air Act in Los Angeles is obviously a continuing one, it is necessary to impose, somewhat arbitrarily, a cut-off date on the items covered in this discussion. I have chosen to cut off developments at approximately mid-December 1973, because that date appears to be a reasonable dividing line between those events that were foreordained by the 1970 amendments to the Clean Air Act, and those that were caused by the national petroleum shortfall accelerated by the Arab oil embargo. This article concludes that amendments to the Clean Air Act would have been adopted even absent an energy shortage, but it is now impossible to differentiate those amendments which are independent of the shortage from those which were caused, intensified, or accelerated by it.

¹⁰. The distinction between ambient standards and emission standards is a very important one. Emission standards relate to the maximum quantity of a particular pollutant that may be emitted from a specified single source, for example, the number of grams per mile of carbon monoxide emitted by an automobile, or the number of tons per day of nitrogen dioxide emitted by a power plant. Ambient air quality standards,
to promulgate primary and secondary ambient air quality standards for certain pollutants and to set emission standards for stationary sources, aircraft, and automobiles.

Once national ambient air quality standards had been established, each state was to determine whether the new federal emissions limitations, together with any additional state or local air pollution programs, would in fact cause ambient air within the jurisdiction to meet the federal standards. In those problem areas where such measures would not prove sufficient, the states were given the initial responsibility of devising a satisfactory solution. Specifically, each state was required to develop an implementation plan which was to provide for monitoring and evaluation of each air basin or part thereof within the state, and to include emission limitations and timetables for meeting ambient standards within three years, or in cases where an extension was authorized and granted, within five years.

on the other hand, specify levels of pollution which may not be exceeded at any point in a given air basin; they are essentially maximum allowable "background levels" of pollution. Ambient air quality measurements take account of the aggregate pollution emitted from all natural and man-made sources, subject to the influences of local natural forces causing air stagnation, circulation, or cleansing in the area. Emissions standards, no matter how severe, might not produce satisfactory ambient air in any given area, since a large number of sources, each of which met the applicable standards could, in the aggregate, produce a pollutant concentration exceeding the ambient standards. National primary ambient air quality standards were to be those "requisite to protect the public health," "allowing an adequate margin of safety," a rather amorphous concept, while national secondary standards were thought to be more stringent standards related to the even more elusive concept of protecting the "public welfare." Clean Air Amendments of 1970 §§ 109(b), 302(h), 42 U.S.C. §§ 1857c-4(b), 1857h(h) (1970).


14. Special planning subsidies were authorized to facilitate solving interstate air quality problems. Id. § 106, 42 U.S.C. § 1857c-1.
15. Id. §§ 110(a), 110(f), 42 U.S.C. §§ 1857c-5(a), 1957c-5(f).
In the federal-state implementation partnership, the federal government was clearly the senior partner. The EPA Administrator was to review all implementation plans, rejecting those plans or parts thereof which failed to meet the Act's requirements. In addition, the Administrator had the explicit affirmative duty of promulgating substitute plans, or parts of plans, when the plans submitted were found to be insufficient.\footnote{17}

To protect against abuse of such power, the Act provided for public hearings before final plans were promulgated,\footnote{18} and for safeguards of judicial review.\footnote{19} More strikingly, the Act guarded against failure to act by providing that any person had standing to sue in federal court to compel the Administrator to perform any mandatory duty required of him by the Act.\footnote{20}

What makes this legislative scheme so remarkable is that an effective implementation plan in an area with severe air pollution problems would have to restrict or modify some economic or social activities of profound consequence to the area. The states were given the first chance to decide which of these activities would be restricted or modified, and in what manner; but where the states failed to act, or failed to act adequately in the view of the Administrator, the Administrator's view would prevail. A provision that received remarkably little attention during the debates on the Act granted this extraordinary power to the Administrator. Section 110(a)(2)(B) explicitly recognized that land use and transportation controls might be necessary to implement the Act's requirements. The Act thus gave the Administrator the power to promulgate implementation plans with land use controls supervening those of state and local authorities where such controls appeared to be reasonable and appropriate to reduce air pollution to the new federally established levels. Clearly, then, the Act contained the potential for the most pervasive scheme yet enacted for federal regulation of traditionally local matters.

III

PRELIMINARY IMPLEMENTATION OF THE ACT

A. The Administrator's Initial Rulings

In April 1971, the Administrator promulgated national primary standards for six major air pollutants: carbon monoxide, sulfur dioxide, nitrogen dioxide, photochemical oxidants, hydrocarbons, and particu-
late matter.21 These standards were based on medical research conducted by the Administrator's predecessor, the National Air Pollution Control Administration of the Department of Health, Education, and Welfare. The Administrator's statutory duty in promulgating primary ambient standards is to protect the public health with allowance of an adequate margin of safety.22 However, setting an air quality standard based on these considerations is not simply a matter of calling upon experts in the medical sciences to answer a precise question about public health. Rather it is first necessary to determine what segment of the public will be used as a yardstick. The aged? Children? People who perform physical labor outdoors?23 Moreover, there is the less philosophical problem that in arriving at a public health standard the Administrator used studies in which the adequacy of the data base was highly suspect.24

Still, even if the public health questions were more clear-cut, the task of setting national air quality standards would remain a difficult one, for the ultimate implementation problem involves not only public health, but economics, politics, and social philosophy as well. Thus, once the health-based standards were set in Act I, Scene I of the implementation scenario, EPA found itself required to promulgate some plans that could not conceivably be effectuated.

Once the standards were adopted, states had nine months until the January 30, 1972 deadline in which to submit their implementation

23. For example, the subjects of a National Air Pollution Control Administration study were something less than a cross-section of society:

Exposure to air containing an oxidant concentration of about 0.13 parts per million (maximum daily value) has caused an increase in the number of asthmatic attacks in about 5 percent of a group of asthmatic patients. Such a peak value would be expected to be associated with a maximum hourly average concentration of 0.05 to 0.06 p.p.m.

Exposure to . . . peak concentrations of 0.1 p.p.m. and above has been associated with eye irritation. Such a peak concentration would be expected to be associated with a maximum hourly concentration of 0.025 to 0.05 p.p.m.

Exposure to . . . average hourly concentrations ranging from 0.03 to 0.30 p.p.m. has been associated with impairment of performance of student athletes.

NATIONAL AIR POLLUTION CONTROL ADM'N, U.S. DEP'T OF HEALTH, EDUC. & WELFARE, CRITERIA FOR PHOTOCHEMICAL OXIDANTS, PUBLICATION No. AP-63, 1970 [hereinafter cited as AIR QUALITY CRITERIA], at 10-10. Based on these conclusions, the Administrator established national primary and secondary standards for photochemical oxidant, both at 0.08 p.p.m.—maximum 1-hour concentration, not to be exceeded more than one day per year. 40 C.F.R. § 50.9 (1973).

24. The conclusion about asthmatic patients (note 23 supra) was based on a single study of 137 patients. AIR QUALITY CRITERIA, supra note 23, at 9-8. The conclusion about student athletes was derived from a single study of 21 track meets. Id. at 9-12.
plans. The Administrator extended this deadline for the transportation control portions of state plans to February 15, 1973. Two reasons were given for this extension. First, the Administrator claimed that states could not adequately predict the air quality effects of transportation control schemes; second, that techniques which would allow such predictions were still being developed by EPA and were not expected to be available early enough for the states to use them in developing their plans. Perhaps the Administrator was also mindful that his field offices would soon be swamped with plans of varying quality and that the job of reading and digesting the evaluations of direct emission controls in the various air basins would be taxing enough, without the added burden of considering complex questions inherent in applying transportation controls. However, this extension was overturned by court order, as was the Administrator's position that the Act did not require implementation plans to prevent deterioration of air quality in areas now having very pure air. But such court orders came much later in the chronology. With the Administrator's initial rulings as their guide, the states were charged with developing implementation plans by January 30, 1972. California, along with the others, undertook to do so.

B. The Pre-existing Pattern of Authority

As of the effective date of the 1970 Act, the state of California had separated air pollution control authority over moving sources (primarily automobiles), from authority over stationary sources. The former were within the jurisdiction of the State Air Resources Board while stationary sources were the responsibility of local government. Each county, save those adjoining San Francisco Bay, was authorized to form an air pollution control district as a matter of local option. Many of the state's rural counties had not elected to do so, but districts were formed in the state's urbanized areas, including those counties having

27. Id.
30. The state legislature in 1955 created a Bay Area Air Pollution Control District in the nine-county San Francisco Bay Area. CAL. HEALTH & SAFETY CODE §§ 24345-74 (West 1967). Other districts are authorized to merge, but none have done so. Id. §§ 24330-41.
jurisdiction over the South Coast Air Basin, namely Los Angeles, Ventura, Orange, Riverside, and San Bernadino counties.

The senior and most experienced county agency was the Los Angeles County APCD. Rules and regulations of the other districts in the air basin were adaptations of the Los Angeles County rules, often copied in haec verba. This occurred only in part because of Los Angeles County's seniority. The Los Angeles County district had pioneered the field of air pollution control and had forced a number of regulations upon resisting interests. It had forced residents of Los Angeles to abandon backyard incinerators as a common method of rubbish disposal. It forced the oil refineries in the area to spend $150,000,000 on emission control equipment. Perhaps most importantly, it forced large scale fuel users, principally the public utilities, to burn low-emission fuels. As a result, Los Angeles, unlike many other American cities, did not have a serious sulfur dioxide pollution problem arising from the burning of coal or gas with high sulfur content. The area's air pollution problems resulted primarily from four of the six pollutants for which national standards had been established: carbon monoxide, photochemical oxidant, nitrogen dioxide, and hydrocarbons.

The fact that Los Angeles did not have serious problems with sulfur dioxide or particulate matter was of little comfort to its residents however, because the Los Angeles County air failed to meet the national standard for oxidant on 241 days during 1970.
The Los Angeles APCD was severely criticized on a number of counts. However, even the most severe critics of the District recognized that the most vigorous district imaginable could not have made more than a marginal contribution to clearing Los Angeles air of most of its pollutants. The stationary source contribution to the problem, while important, paled by comparison to that of the automobile.

Meanwhile, for areas within the South Coast Air Basin but outside Los Angeles County proper, prospects for local control of air pollution were decreasing rapidly. Smog from Los Angeles, Orange, and Riverside Counties was carried by ocean breezes inland to the city of Riverside, and even to the desert resort of Palm Springs more than 100 miles from downtown Los Angeles. The problem was particularly acute because many residents of Riverside and Palm Springs had moved there precisely because of health problems or special sensitivity to air pollution in the Los Angeles area. There were no major stationary sources of air pollution in these communities for local authorities to abate. Therefore, local residents had to depend on action from state or federal authorities, or on the willingness of the supervisors of Los Angeles or Orange Counties to curtail economic activities in their own counties for the benefit of citizens of Riverside.

But the Los Angeles and Orange County APCD's could do little in any event; they were powerless to deal with the real villain, the automobile. The control of motor vehicle pollution was the responsibility

0.10 p.p.m. that was exceeded on 241 days. Possibly the national standard of 0.08 p.p.m. was exceeded even more frequently.


40. Motor vehicles contributed 75% of the oxides of nitrogen in the air basin, 87% of the highly reactive organic gases (leading to hydrocarbon and oxidant pollution), and 97% of the carbon monoxide. They also contributed 34% of the particulate matter and 16% of the sulfur dioxide. Cal. Implementation Plan, supra note 33, pt. VI, at 15-16.

41. Smog in Riverside reached a crisis level in the summer of 1972 far worse than Los Angeles' experience that summer. L.A. Times, Aug. 30, 1972, at 30, col. 1. Palm Springs was officially designated as the city with the worst air pollution problem in the State in 1972. L.A. Times, July 2, 1973, § 1, at 2, col. 5.

42. See generally Trumbull, Federal Control of Stationary Source Air Pollution, 2 ECOLOGY L.Q. 283 (1972).

43. Stationary sources in Riverside County's portion of the air basin contributed only 4.4 tons per day of highly reactive organic gases to the air basin stationary source total of 195 tons per day, 5.7 tons per day of oxides of nitrogen out of 360, 1.8 tons per day of sulfur dioxide out of 258, 32.4 tons per day of carbon monoxide out of 103, and 11.6 tons per day of particulate matter out of 128. Cal. Implementation Plan, supra note 33, pt. VI, at 14, 20.

44. A bill to create a basin-wide air pollution control district in the South Coast Air Basin, A.B. 2283, was passed by the State Legislature in 1973, but was vetoed by the governor. L.A. Times, Oct. 3, 1973, § 1, at 1, col. 2. In 1974 the legislature again passed, and the governor again vetoed, such a bill, S.B. 1556. L.A. Times, Sept. 28, 1974, pt. 1, at 1, col. 2.
of the state Air Resources Board. The Board consists of five citizens appointed by the governor who serve on a paid part-time basis. In addition, the Board has a full-time professional and supporting staff, upon which it is heavily dependent.

The basic function of the Board since its inception in 1960 has been to prescribe emission control limitations for motor vehicles. In addition, it has the responsibility for encouraging the development of so-called vehicle emission retrofit devices and ultimately for requiring their installation on older cars in order to reduce harmful emissions.

The Board has implemented a series of increasingly severe restrictions on emissions from new automobiles, culminating in very stringent restrictions beginning with the 1970 model year. The Board, however, has not been so successful in dealing with the emission retrofit problem. As of the effective date of the Act, no exhaust retrofit device had been approved by the Board and required to be installed on older motor vehicles.

Although it has no jurisdiction over transportation or land use, the Board does have the best perspective and expertise on the air pollution problem of any state agency. Accordingly, it was assigned the task of preparing California's implementation plan pursuant to the Clean Air Act.

IV
THE IMPLEMENTATION SCENARIO

The drafters of the implementation plan responded to the Act's challenges by preparing a plan composed of two disjoint segments. The first described in excruciating detail the state's existing air pollution control scheme, including a 2000 page appendix listing all rules

45. CAL. HEALTH & SAFETY CODE §§ 39020, 39021.3 (West 1967).
46. Id. §§ 24378, 24390.
47. Id. §§ 39107, 39107.6, 39177.3, 39180. Retrofit devices are add-on attachments to standard automobile engines or exhaust systems that reduce exhaust emissions. Retrofit devices should be contrasted with alternative methods of emission reduction such as engine redesign or fuel modification. The Board also has other functions, including the duty to develop a statewide perspective. Id. § 39050 et seq.
48. Id. §§ 39101, 39101.5, 39102, 39102.5 (West 1967). The functioning of the California Board was saved from federal preemption under 1967 legislation by a congressional fight. See N.Y. Times, Nov. 3, 1967, at 1, col. 3. As a result of the ARB's increasingly strict regulation of new cars, air pollution in Los Angeles County may have decreased in recent years. The state ambient air standard for oxidant (0.10 p.p.m.), was exceeded on 271 days in 1966 compared to 241 in 1970. 1971 Profile, supra note 38, at 75. However, the data are not unambiguous since the Los Angeles APCD's "first-stage alert" level of 0.50 p.p.m. was exceeded on 9 days in 1970, but on no more than 6 days in any of the preceding 11 years. Id. at 171.
and regulations of each air pollution control district. The second segment of the plan discussed a number of alternative control restrictions that might be adopted, including some which had been before the legislature in previous sessions and had been defeated. Among the proposals for additional state action were: requiring retrofit devices, requiring conversion of vehicle fleets from petroleum to gaseous fuel, requiring maintenance and inspection of vehicles, and transportation control measures.

However, the plan stated that existing state law together with federal regulations under the Act would satisfy the 1975 requirements in the South Coast Air Basin only with respect to those pollutants which posed no significant problem, i.e. sulfur dioxide and particulate matter. In regard to nitrogen dioxide and carbon monoxide, the standards might be met by 1975 and 1977 respectively, if the suggested restrictions were imposed and if the plan's extremely optimistic assumptions proved correct. Furthermore, even with additional controls and two extra years, the Basin would not even come close to meeting the oxidant standard by 1977. Thus, the California Implementation Plan was not so much a scheme for implementing the Clean Air Act as it was a declaration that the Act's requirements could not conceivably be implemented throughout California.

If the idea of giving the states the first chance to prepare implementation plans was to minimize the abrasiveness of any federal intrusion and to permit the Administrator to adopt locally favored control options, these goals were not furthered by the California Implementation Plan. California's additional proposed restrictions were neither fish nor fowl. They had been adopted neither by the legislature nor by the governor in an unequivocal manner, nor had they been flatly

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50. For rules applying to the state in general see Cal. Implementation Plan, supra note 33, pt. I, at 62-74; for the South Coast Air Basin see id., pt. VI, at 80-114.
51. For restrictions applicable to the state in general see id., pt. I, at 75-83; for the South Coast Air Basin see id., pt. VI, at 115-18.
52. See text accompanying note 55 infra.
54. Id. at 2, 119-20.
55. Id. at 2, 122-24. Projections in the implementation plan indicated that in 1977 the Air Basin would have 349 tons per day of reactive hydrocarbons while the Clean Air Act standards would have permitted only 213. Id. at 128.
56. The plan was transmitted to the Administrator by the Governor of California, along with a formal request, inter alia, for a two-year extension for the South Coast Air Basin to meet carbon monoxide standards. Cal. Implementation Plan, Letter of Transmittal, Jan. 21, 1972. The governor, however, did nothing to embrace the ideas discussed in his legislative package. Indeed, the governor subsequently appointed a special task force to study the question of vehicle inspection, which did not issue its report and recommendations until October 1972. Report and Recommended Program of the Task Force on Periodic Vehicle Inspection and Maintenance for Emission Control, Oct. 1972 [hereinafter cited as Inspection Task Force Report]. Thereafter, a pilot program
rejected, for the state's political leaders had not yet felt the pressure of the Clean Air Act. Moreover, whether the Administrator decided to adopt or to reject the proposals, the plan on its face proved that they were inadequate to clean the air in the South Coast Basin.

The Administrator had a clear legal duty under the Act to reject those parts of the state plan that did not meet the standards of the Act. He had a further duty under his regulations to reject any part of a plan not supported by a showing that the state would provide adequate authority to implement it. There was no legal authority for that portion of the plan dealing with conversion of vehicle fleets to gaseous fuels, nor for any of the transportation control measures, nor for the regular inspection of cars on the road, all of which were necessary to meet the carbon monoxide standard by 1975 and the nitrogen dioxide standard by 1977. On May 31, 1972, barely within the four-month statutory deadline, the Administrator rejected that portion of the plan dealing with oxidants in the South Coast Air Basin, because it failed to show compliance with national ambient air quality standards; rejected the plan for nitrogen dioxide and the two-year extension therefor requested by Governor Reagan because the plan did not make use of reasonably available technology; and accepted the plan with respect to carbon monoxide.

At this point the Administrator must have sorely wished for more time, not only because his office was swamped with implementation plans but also because he must have hoped that his rejection of the plan with respect to oxidants would force the state to act to avoid a solution imposed from Washington. There was no rest for the Ad-

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57. In the 1972 legislative session, Senator Bielenson introduced bills requiring gaseous fuel conversion for certain vehicle fleets, S.B. 657, and mandatory inspection of all motor vehicles in smog-ridden areas of the state, S.B. 661. Neither bill passed the legislature.

58. Clean Air Amendments § 110(a)(2)(B), 42 U.S.C. § 1857c-5(a)(2)(B) (1970). The Administrator's regulations required only a timetable for obtaining such authority for transportation control measures rather than the more stringent requirement of the statute, 40 C.F.R. § 51.11(b) (1973). The Administrator's approval of the California plan for carbon monoxide and nitrogen dioxide demonstrated that he was willing to settle for even less, since the plan contained little more than a hope for such authority.


60. Approval and Promulgation of Implementation Plans, 40 C.F.R. § 52.229(a) (1973). A two-year extension for meeting the photochemical oxidant standards was granted. Id. § 52.222(b). The extension was subsequently rescinded. See text at note 65 infra. Submission of Transportation and/or Land Use Controls, 38 Fed. Reg. 7323 (1973).

61. 40 C.F.R. § 52.230(a) (1973).

62. Id. § 52.237(a).
ministrator, however, because yet another mandatory duty required him to promulgate a substitute plan within two months for those plans or parts thereof he had rejected, and the South Coast Air Basin harbored a number of potential litigants anxious to see that the Administrator faithfully and promptly performed his mandatory duties. In September 1972, two actions were filed by the Center for Law in the Public Interest on behalf of the mayor and certain other residents of the city of Riverside. One action sought review of the Administrator's grant of a two-year extension to meet the oxidant standards. The suit was mooted, however, when the District of Columbia Circuit ordered the Administrator to retract all such extensions.

The second action was filed in the United States District Court under the Administrative Procedure Act against the Administrator for his failure to promulgate a substitute plan within two months of the date of his rejection of portions of the California Implementation Plan. Plaintiff's case was fairly simple. The Administrator had a clear statutory duty under section 110(c), and he failed to discharge it. A mandatory injunction was appropriate not only because of the clear legislative policy of the Clean Air Act, but also because of the then existing air pollution crisis in the city of Riverside, and the health danger to many Riverside residents. The Administrator's defense was two-pronged. First, on procedural grounds, he argued that the action did not meet the requirements under section 304 of the Act because plaintiffs had not given the requisite 60-day notice prior to filing suit, and, further, that section 304 provided the exclusive avenue for judicial review of the question in dispute. On the merits, the Administrator responded simply and understandably that his capabilities were overtaxed and that he was unable to meet the statutory deadline. The Administrator requested an extension until February 15, 1973, to promulgate his plan. Judge Irving Hill of the District Court had no difficulty

63. The statutory requirement under § 110(c) requires the Administrator to promulgate his substitute plan within six months of the deadline for submission of a state plan in all cases where state plans do not meet statutory requirements. The Administrator had four months (until May 31, 1972) to review the plan and determine its sufficiency under § 110(a)(2). 42 U.S.C. § 1857c-5(a)(2) (1970).

64. Regional Anti-Pollution Authority v. E.P.A., No. 72-2095 (9th Cir. 1972).

65. Natural Resources Defense Council (NRDC) v. EPA, 475 F.2d 968, 4 ERC 1945 (D.C. Cir. 1973). The decision was based on the ground that the Administrator had granted extensions without following the procedure and making the findings required under section 110(e).


67. Memorandum and affidavit in opposition to preliminary injunction, Riverside v. Ruckelshaus, note 66 supra.
making short shrift of the Administrator's legal defenses. Ultimately, however, the Administrator ended up with half a loaf since, after various continuances and delays, the court's order was not entered until November 16, 1972, and then it gave the Administrator until January 15, 1973, to promulgate a substitute plan.\(^6\)

To students of the legal process, the chronology would have become even more interesting had the Administrator reported to Judge Hill that he was unable to promulgate any plan that met the standards of the Act without destroying the economic and social fabric of Southern California, or had he promulgated a plan which would have reduced air pollution in Los Angeles materially but would have come nowhere near complying with the strict standards under the Act, or if Judge Hill had ordered the Administrator to promulgate a plan within 48 hours. Undoubtedly, many generations of students will be forced to face such questions in law school hypotheticals and examinations, but none of these events occurred in fact. The Administrator chose instead what in the view of the author was an extraordinary act of responsibility: he took on his shoulders the visible public blame for promulgating a plan that was, on its face, ridiculous.

The original plan carefully explained that even if the measures proposed in the California Implementation Plan and others under discussion were adopted, the air in the South Coast Air Basin would not come close to meeting the federal standards, and that lawful air quality could be achieved only if the aggregate number of vehicle miles traveled in the basin were reduced by approximately 80 percent! The mechanism chosen to effect this reduction was gasoline rationing. The basic plan provided that by 1977 EPA would ration gasoline on a month-by-month basis with the expectation that gasoline suppliers would be constricted in some cases by as much as 82 percent.\(^6\) Even the recent nationwide gasoline shortage with its attendant inconvenience never came close to this figure. The vast majority of the adult population of Los Angeles is peculiarly dependent upon the automobile. Most families in the area have arranged their lives on the assumption that each adult in the family will have a car. A house may be considered well-located if it is merely a half-hour away by freeway from one's job, beach, doctor, favorite discount shopping center, and social friends. The city's rapid transit system consists of a fleet of approximately 1500 buses which are generally used only by people with no viable economic alternative. To suggest reducing Los Angeles

\(^{68}\) Riverside v. Ruckelshaus, 4 ERC 1728 (C.D. Cal. 1972).

\(^{69}\) EPA, Calif. Air Quality Standards: Approval & Promulgation of Implementation Plans, 38 Fed. Reg. 2194, 2195, 2199 (1973). The plan also proposed less drastic measures such as retrofit devices for used cars, conversion of vehicles to gaseous fuels, and compulsory annual vehicle inspection. Id. at 2195-96, 2198-99.
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automobile use by 80 percent in the course of four years without developing a viable alternative is tantamount to proposing that residents in the area forego 80 percent of their gross income.

Nonetheless, the Administrator's action might have had a constructive effect. EPA was required to hold public hearings on the plan, and because of the severity of the plan, the hearings would attract wide public attention. The hearings could thus have been an occasion for massive public education concerning sacrifices necessary for clean air; they could have led to a consensus as to what sacrifices the area's political leaders deemed palatable within the next three to five years; and most importantly, they could have started a process whereby political leaders would begin building public support for decreased automobile use and increased public pressure for the development of short-term transportation alternatives. Conceivably, the hearings could also have brought to the Administrator's attention facts that had escaped him or some brilliant solution that had eluded him. The hearings, however, produced none of these benefits.

At the Los Angeles hearings held in March 1972, the principal speakers followed one general format. First, they told EPA that its gas rationing plan was unrealistic and unenforceable. Then each speaker advanced his own pet theory, which was either to do more of what was being done now, to get tough with Detroit, or to advance a transportation substitute which could not possibly become operational in the near future. The proposed solutions generally ignored the EPA's work, and even the Clean Air Act. The net result was not only a failure to advance the cause of clean air, but also a reinforcement of the notion that the Administrator was some sort of remote and irresponsible bureaucrat who had proposed the craziest solution imaginable.

After the hearings, the Administrator prepared the "final" plan. At this point his labors were made more difficult by court rulings in cases arising in other areas: Natural Resources Defense Council v. EPA, in which the Administrator was required to rescind the extensions for transportation and land use plans, and Sierra Club v. Ruckel-

70. See, e.g., March Hearings, supra note 36, at 82-84 (testimony of Senator Tunney); id. at 96, 103-05 (testimony of Los Angeles County Supervisor James A. Hayes).
71. E.g., testimony of Supervisor James A. Hayes, id. at 98; and Donald C. Tilmann, L.A. Chapter, Amer. Soc. of Civil Engineers, id. at 553, 554-55 (complete the freeway system to eliminate traffic congestion).
72. E.g., testimony of Supervisor Kenneth Hahn, id. at 168, 176-82, 184-85.
73. E.g., testimony of Sen. Tunney, id. at 84-86 (develop an alternative to the internal combustion engine); Supervisor Baxter Ward, id. at 219-23 (obtain federal funding to acquire existing railroad trackage and rights of way for conversion to use as a rapid transit system).
74. 475 F.2d 968, 4 ERC 1945 (D.C. Cir. 1973).
in which he was compelled to disapprove plans which did not protect regions with good air quality from degradation down to the federal standards.

On July 2, 1973, the Administrator proposed a revised plan for the South Coast Air Basin. It set forth three alternative control plans: one plan would result in literal compliance with the Act, but only with 100 percent gasoline rationing; a second plan, identified as the "EPA Plan," required the limitation of gasoline consumption to 1972-73 levels and the introduction of other transportation control measures; and a third plan showed the effect of existing control measures without additional transportation controls. Under this third plan, reactive hydrocarbons would be reduced from the 1970 level of 1,601 tons per day to 848; the second plan would reduce them to 419; and literal compliance with the Act would require a further reduction to 112.

The Administrator commented:

Under the Clean Air Act as written, the Agency includes in this plan a measure [total gasoline rationing] which can achieve the standards in 1977 even if it appears impracticable and unworkable . . . . However, the Agency will utilize every means available to avoid the need to impose impracticable measures to reach that goal [achieving the standards for oxidants and nitrogen dioxide] by 1977. Thus the Administrator, in order to discharge his duties under the Act, was driven to promulgate a measure which he and everyone else recognized as a patent absurdity.

At the public hearings, EPA's proposed plan was attacked by speaker after speaker as being unduly restrictive and causing unnecessary economic dislocation. Los Angeles County and a number of

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77. The transportation control measures include such controversial measures as the absolute prohibition of the use of certain motorcycles during certain seasons, id. at 17687 (proposed § 52.246), and a reduction of public parking places, id. at 17686-87 (proposed § 52.245).
78. Id. at 17684.
79. Id. at 17683.
80. See Transcript of Hearings on EPA's revised Implementation Plan for Los Angeles, held at Los Angeles, Aug. 9-10, 1973 [hereinafter cited as August Hearings], at 21, 24, 26 (statement of Peter Schabarum, Chairman, L.A. County Bd. of Supervisors); id. at 120 (statement of Stephen Bilheimer, L.A. Central City Ass'n); id. at 189 (statement of Fred Lewellen, L.A. Chamber of Commerce); id. at 290 (statement of Jerry Matney, Mayor of Huntington Beach). The July plan also was vigorously attacked by those particularly hurt, most notably motorcycle riders and the motorcycle industry, who would suffer a drastic curtailment of motorcycle riding during some months.
agencies joined in proposing far less drastic action.81

The Administrator announced his third plan on October 15, 1973, and formally promulgated it on November 12, 1973.82 The third plan differed most notably from its predecessors in that it included several specific and drastic transportation control measures. It required conversion of specified freeway lanes and surface streets to exclusive use by buses and carpool.83 It also required a drastic change in the air basin's parking rate structure, imposing a surcharge on commercial parking rates, which would increase in several steps to a maximum of 25 cents per hour by July 1, 1976. It also required an initial annual surcharge of $180 on free parking spaces provided by businesses to their customers that would increase eventually to $450 per year.84 The plan also required employers to impose a charge on employee parking spaces increasing to $2.50 per day over commercial parking rates in the vicinity and to provide employees with incentives to use carpool and mass transit systems.85 At least 50 percent of the funds so collected were to be used to support mass transit facilities.86 The final plan included a provision to the effect that literal compliance with the Clean Air Act would still require a further reduction of vehicle miles traveled, and that gasoline limitations would be necessary. The Administrator added a comment: "[t]he EPA does not believe that massive gasoline rationing is either socially acceptable or enforceable, and will work toward alleviating the necessity for such drastic control in 1977."87 Such transportation control measures were no more popular than their predecessors. Soon after promulgation of the plan, numerous suits were filed to enjoin its enforcement, and the Administrator deferred the effective date of the more drastic provisions of the plan.88

This administrative respite came simultaneously with mounting

See, e.g., id. at 135 (statement of Stuart Ross, Motorcycle Industry Council); id. at 159 (statement of Leo Lake, Yamaha); id. at 206 (statement of Dennis David, Kawasaki); id. at 227 (statement of E.W. Coleman, Triumph).

81. Id. at 21 (statement of Peter Schabarum); id. at 28 (statement of Los Angeles Mayor Thomas Bradley). See "Clean Air," The Local Agencies Plan for the Los Angeles Air Basin, Aug. 1973; compare August Hearings, supra note 80, at 105 (statement of Mark Braly).


83. Id. at 31254.

84. Id. at 31247-48.

85. Id. at 31247.

86. Id.

87. Id. at 31237. The plan also requires a reduction in motorcycle use unless motorcycles comply with reduced emissions limitations. It also includes less drastic transportation control measures and various stationary source controls as well. Id. at 31235-37.

pressure for congressional relaxation of the mandates of the Act. It is appropriate to conclude the description of the implementation process at this point and to begin an evaluation of the 1970 Act.

V
EVALUATING THE IMPACT OF THE ACT

Perhaps the disappointing results of the Clean Air Act can be described rather simply—the standards were too strict, or, more precisely, the time frame in which the goals had to be reached was too short. If the Administrator had set less stringent standards, or if the Act had allowed far more time for compliance, then we would not have wasted our time and resources attempting the impossible. However, such an explanation is far too simple; it overlooks the valuable lessons learned in considering why the act was not effective in clearing the air.

A good starting point is the obvious question, “Why did the Administrator set standards which were, for all practical purposes, impossible to reach within the time frame of the Act?” It appears from Mr. Ruckelshaus' public statements that he knew, or at least suspected, the impossibility of meeting the standards, but felt he had no choice but to set them.89 If so, the inquiry must be redirected, to why Congress required the Administrator to set impossible standards. The most plausible explanation is that Congress did not know that health-based standards would be impossible to reach within the established time. The alternative hypothesis—that Congress knew what consequences would follow from setting such standards—is simply incredible. Even today it is impossible to know with any certainty what results would follow from attempting to meet any fixed national standard of air quality.

Indeed, it is precisely because the problem is so complex and of such profound social and economic significance that it is so intractable. The complexities come into focus as we examine what the California Implementation Plan might have been under the best of all possible circumstances. For this purpose it is necessary to examine some of the measures proposed to reduce air pollution in Los Angeles.

A. Stationary Source Control Measures

First, let us consider what reductions could have been achieved in stationary source emissions. The principal problems involved are il-

89. A number of comments [submitted to the EPA] questioned the feasibility of implementing the proposed [ambient air quality] standards. Because the Clean Air Act, as amended, does not permit any factors other than health to be taken into account in setting the primary standards, no revisions were made on this basis.

ILLUSTRATED BY EXAMINING THREE COMMONLY PROPOSED CONTROL MEASURES: (1) REDUCING EMISSIONS FROM GASOLINE STATIONS, (2) CRACKING DOWN ON NITROGEN OXIDE EMISSIONS FROM POWER PLANTS, AND (3) PREVENTING CONSTRUCTION OF NEW STATIONARY SOURCES.

1. GASOLINE VAPOR EMISSIONS

Emission of gasoline vapors pours 65 tons of oxidant per day into the South Coast Air Basin. The problem is that gasoline tends to evaporate and add oxidant precursors to the air whenever it is not completely enclosed in a container. This occurs when fuel is transferred from one container to another, e.g. when tank trucks are filled at the refinery, when gasoline station tanks are filled from tank trucks, and when individual automobiles are filled at the gasoline station. At the time of the Act's passage, the problem was being addressed at the refinery and tank truck levels. Regulations had been promulgated by the Los Angeles and by other APCD's, and the oil industry had spent millions in equipment at the refineries to capture such vapors. Equipment was being installed on tank trucks to trap a high percentage of vapors which escape during the filling of gasoline station tanks. The remaining unregulated area was the filling of private cars at gasoline stations. It was not difficult to promulgate a regulation requiring recovery of at least 90 percent of such vapors, and indeed the San Diego APCD did so. The regulation proved impossible to enforce, however, because no one device existed that would catch 90 percent of the escaping vapors and at the same time accommodate the wide variation in shapes and locations of fuel tank filling points, without creating an undue fire hazard by concentrating gasoline vapors in a potentially explosive configuration. The District's only legal tool was the threat of closing down commercial operations that did not meet their standard. The San Diego APCD adopted such a regulation by prohibiting operation of new gasoline stations that failed to meet vapor emission standards. In theory, at least, such a tough-minded regula-

90. No inference should be drawn from the enumeration in the text that the only room for reduction of stationary source emissions was in pursuing these measures. Critics have suggested a number of areas of improvement, especially of the Los Angeles APCD. See, e.g., Zafman, Profile of an Air Pollution Controversy, J. BEVERLY HILLS BAR ASS'N 46 (Sept. 1972).
92. March Hearings, supra note 36, at 236-37 (statement of Philip Verleger, counsel for Western Oil & Gas Ass'n); id. at 828-30 (statement of William Hoffman, Vice President, Arco Corp.).
94. See, e.g., Standard Oil Co. of Calif., Control of Hydrocarbon Vapor Losses During the Marketing of Gasoline at Service Stations, June 1972, at 203.
95. San Diego APCD, Rule 62. Existing gas stations or those under construction
tion should force the industry to seek to avoid economic loss. It should also offer a very substantial competitive advantage to the company which first devised a satisfactory technological solution, thereby conscripting the powerful forces of private enterprise capitalism to serve the side of the angels. In actuality, however, such a regulation often results only in vigorous efforts by regulatees to avoid regulation.

The inherent weakness of such regulatory measures is that they lack credibility. If no company developed the necessary technology, then the regulation would force severe economic dislocations that would plainly be politically unacceptable. Political forces generated by, or, more probably, anticipating such dislocation, can be expected to effect a rescission or amendment of the regulation. Thus, the constructive forces of capitalism will be activated if, and only if, the industry really believes that economic punishment will be visited upon those who fail to develop the appropriate technology. Indeed, there may be a substantial economic risk for a company that spends its resources trying to meet a strict standard only to find that the regulations are ultimately relaxed to permit the sale of his competitors’ more conventional products. Such a company may also find itself in the position of having committed substantial resources to producing and distributing a comparatively high-cost product that is competitively unattractive, such as unleaded gasoline, or an automobile with poor performance and fuel economy characteristics. An economically rational person will seek to avoid such risks unless the most compelling evidence indicates that any alternative course would be disastrous.

The problem of gasoline vapor recovery technology is a microscale version of the problem faced by the Administrator in attempting to force Detroit to produce clean-air cars. Industry tells him that the necessary technology is not available. He can try to coerce and to stimulate technological development by prohibiting the sale of cars with unsatisfactory pollution emissions. However, no reasonable person can believe that the American automobile industry will be shut down, regardless of what it does or does not do. Therefore, the effectiveness of such a prohibition would remain doubtful, to say the least.

This discussion is not intended to suggest that responsible industrial leaders necessarily resist developing air pollution control technology. The gas pump industry, for example, may be working in good faith to develop new technology. It has economic incentives to do so, because once technology is developed regulators will be able to promul-

were required promptly to submit a plan evidencing compliance with the new limitations by January 1, 1974. See note 98 infra.

96. Unleaded gasoline, for example, proved to be competitively unattractive. See BUSINESS WEEK, Aug. 21, 1971, at 44; OIL & GAS J., Aug. 7, 1972, at 24.
gate credible and thus politically supportable rules forcing installation of new devices on existing gasoline pumps. Pump manufacturers will then have a vastly expanded market for new pump equipment. The point is, however, that the intensity of an industry's research and development activities is influenced by many factors wholly unrelated to regulatory efforts. These include the availability of capital for such purposes, the foresight of the industry leaders, their calculus as to the possible competitive disadvantages of committing resources to such products, and the probability of patent or other proprietary protection for any fruits of their own development.

On the national scale the Administrator has the potential ability to mobilize public opinion and to organize political forces to bring pressure to bear on those he feels are recalcitrant. But what can the poor Board of Supervisors of San Diego County do to convince the oil companies to convince the pump manufacturers that new devices must be developed forthwith if they are to avoid a ban on construction of new gasoline stations? The answer of course is that there is nothing the supervisors can do to make their threat credible and so, inevitably, when push comes to shove, the regulation is suspended.

2. Power Plants

By 1970 the power plant problem had become a static situation. The Los Angeles APCD had imposed tough regulations on the emission of nitrogen oxides from any new single stationary source. The rule permitted only 140 pounds per hour of nitrogen dioxide to be emitted from new sources, compared with the five or six tons per day emitted by many existing power plants. The rub was that a single source was defined as a "single smokestack." Where a plant had multiple smokestacks operating so that each smokestack was associated with a specific operating unit that could be operated or shut down independently of other operating units, each operating unit and associated smokestack would be considered a separate source even though it was


98. Presently, satisfactory hardware has been installed at some gas stations in San Diego. The deadline for compliance was extended three times until December 1, 1974, at which time it was put into effect. L.A. Times, Mar. 30, 1974, § II, at 2 col. 5.

The Administrator has now joined the mini-battle. In his plan promulgated on November 12, 1973 for the South Coast Air Basin, he has required installation, by May 1977, of devices similar to those required by the San Diego APCD. California Air Quality Standards, § 52.222 Extensions, 38 Fed. Reg. 31251-52 (1973).


100. Los Angeles APCD, Rule 67.
but one part of a larger economic unit at the same location. As a result, local utilities added small, independently operated gas turbine generators each of which produced less than 140 pounds per hour, but which in the aggregate produced more nitrogen dioxide per kilowatt hour than the larger plants.\textsuperscript{101}

The obvious question is why the supervisors would impose a restriction on air pollution and simultaneously emasculate it. Immediate possibilities might be thought to include corruption, venality, or possible stupidity. More likely, perhaps, the explanation lies in the political attractiveness of the grandstand play whereby a politician takes credit for promulgating an anti-pollution rule more strict than any heretofore known to man, while removing its bite by means not easily visible to the public.

It would certainly be naive to dismiss such disagreeable possibilities as improbable. However, such answers do not explain why only the public utilities benefited while the oil companies were forced to comply with more straightforward rules.\textsuperscript{102} More importantly for our purpose, they fail to take into account several reasons why responsible political leaders are unwilling to impose more severe restrictions than those effectively imposed by the APCD's rules.

First, we should identify one factor which distinguishes this example from the gas vapor problem. The Air Pollution Control District is not in the position of a single county trying to impose economic sanctions on a national industry. The geographic jurisdiction of the Los Angeles County Board of Supervisors encompasses much of the local utilities' service areas and capital investments. Therefore, this matter does not have the David and Goliath characteristics of the gas vapor emission problem.

However, the power plant situation is ultimately no easier to solve. At the root of the problem is the very structure of decisionmaking in air pollution control. Individualized decisions are made by diverse agencies with no vision or control of the aggregate effect of their decisions. Resulting difficulties are highlighted in the following example which, although it involves an EPA regulation, illustrates the problems faced by local APCD's.

In September 1972, EPA proposed a regulation that would have severely limited nitrogen dioxide emissions from at least one

\textsuperscript{101} Lees \textit{et al.}, Smog: A Report to the People 1972, prepared by the staff of California Institute of Technology's Environmental Quality Laboratory, [hereinafter cited as EQL Report], at 89.

\textsuperscript{102} See text accompanying notes 91-94 supra. For a contrary view see Willick \& Windle, \textit{Rule Enforcement by the Los Angeles County Air Pollution Control District}, 3 \textit{Ecology L.Q.} 507 (1973), especially at 518-24.
plant of the Southern California Edison Company.103 Edison responded that the regulation would indeed prevent 200 pounds of nitrogen dioxide from entering the atmosphere, but it would also force the closure of the plant.104 The argument was advanced that the minimal improvement in air quality105 was not worth the economic and social costs of a power shortfall.

First, it is unlikely that either the local APCD or the EPA could devote its resources to a critical examination of the utility's claim that it would have to shut down the plant. Second, neither agency could authorize replacement facilities, whether fossil-fuel-burning or nuclear. Third, replacement facilities could not possibly be designed, licensed, constructed, and put in operation in time to prevent a shortfall.106 Therefore, another credibility problem would arise, at least for the combination APCD-Board of Supervisors of Los Angeles County. The utility could safely assume that the Supervisors would not take the risk of bringing blackouts and brownouts to their constituents.107

Note in this instance also that strict regulations, when viewed individually, appear to be non-cost-effective.108 That is, taken separately, regulations may be susceptible to arguments such as those advanced by Edison, while in the aggregate, the social benefit of all pertinent regulations may indeed outweigh all their social costs.109 None of our agencies is equipped to examine adequately the aggregate issue. Therefore, even if the single smokestack rule were derived from a simpler, easily cured fault, there would still be an enforcement problem so long as diverse agencies weigh the diminishing returns of only those measures within their respective jurisdictions.

103. 40 C.F.R. § 52.230(b)(3) (1972).
104. Statement of David J. Fogarty, Vice President, Southern California Edison Co., at EPA hearings in Los Angeles, Nov. 9, 1972.
105. The improvement would indeed be minimal in an air basin which normally contains more than 1500 tons of nitrogen dioxide per day, most of which comes from automobiles. Cal. Implementation Plan, supra note 33, pt. VI, at 129.
106. Recent attempts by the two principal local utilities to obtain new facilities in the desert and on the coast near San Clemente have been delayed, in part because of opposition from environmentalists.
107. This self-evident point has recently been empirically verified by the granting of variances to burn high-sulfur fuel in the South Coast Air Basin, when low-sulfur fuel became unavailable in the winter of 1973-74. L.A. Times, Jan. 5, 1974, pt. 1, at 16, col. 1.
108. I use the term "cost effective" herein to include social as well as financial costs.
109. It is possible, of course, that the aggregate effect of each individual decision against strict enforcement is the correct welfare economics solution, since the aggregate of all the arguments is that the costs of all the regulation outweigh the benefits. The point is, however, that the aggregate issue is never fairly examined by a single decision-maker who is prepared and equipped to analyze critically each industry argument against enforcement.
3. Limiting New Construction

The proposal to limit construction of new pollution sources poses an even more difficult and fundamental question. Any rule that would be strict enough to have a significant effect on air pollution control problems would also raise a tangle of unanswerable economic and social questions. For example, a rule proposed by the Administrator on September 22, 1972, stated that no new source construction would be permitted if such construction would interfere with attainment or maintenance of any primary or secondary standard.\(^\text{110}\) In the South Coast Air Basin, where the standards could not reasonably be met under any foreseeable circumstances, apparently any new source of oxidant or nitrogen oxides would be banned by such a rule.\(^\text{111}\) The Administrator underscored the rule's breadth by specifically exempting very small sources.\(^\text{112}\) Less stringent variations on the same theme could prohibit construction of new sources emitting more than 100 tons per year of specified pollutants\(^\text{118}\) or some other fixed amount.

Here are but a few questions such a rule would raise: Would such a prohibition encourage job migration outside the air basin? If so, would such a migration tend to leave behind a relatively high concentration of unemployable or dependent persons? Would economic growth in the basin be stifled? Are there any municipalities or school districts in the air basin that depend on rapid growth to provide a tax base sufficient to achieve economic viability? If so, would rising property taxes force people to abandon homes in such communities? The tangle grows more and more complex, and no clear answers emerge.

In the face of such uncertainty, responsible political leaders must proceed cautiously. They cannot impose drastic restrictions in the absence of reliable predictions of their effects. But predictions of high

110. (2) No owner or operator shall commence construction or modification of a stationary source [in the South Coast Air Basin or other areas designated in proposed regulation § 52.233(f)(1)(i)] after the effective date of this regulation without first obtaining approval from the Administrator of the location and design of such source. . . .

111. New source construction might be permitted if it were to replace older high polluting sources, or if unique local meteorological conditions allowed such construction.


113. This standard is found in the Administrator's definition of a "point source" of pollution. 40 C.F.R. § 51.1(k)(1) (1973).
reliability simply cannot be made today for any proposal sufficiently restrictive to abate air pollution significantly. Thus, the problem is not that the burdens appear to outweigh the benefits, but that the burdens are unknown and potentially catastrophic. We are properly unwilling to take severe action in the face of such uncertainty, but we also have no institutional mechanisms for developing sufficient certainty upon which we can act.

Indeed, part of the problem is that it is not even possible to foresee with confidence whether the net contribution to pollution from growth is positive or negative. Growth in certain patterns might permit people to decrease their aggregate transportation between home and jobs, thereby decreasing automotive pollution. Also, growth in high density patterns might facilitate development of a less polluting rapid transit system. This suggests that rather than limiting construction, we should perhaps attempt to reconcile pollution abatement with economic growth by regulating land use patterns and related transportation systems. However, we of course would continue to encounter the same problems. Land use patterns and transportation systems that would effectively abate pollution would also have to be responsive to changing needs as well as politically and philosophically acceptable. Creating institutional mechanisms to develop such patterns would require a great deal of time and money, and may well simply not be possible. Thus, we may never have the necessary confidence in our predictions to impose land use controls effective enough to improve air quality substantially.

B. Mobile Source Controls

Having thus considered some stationary source control difficulties, it is appropriate to turn to a problem usually considered more complex, that of automotive sources.


115. Various of the questions involved are continuously being studied by academic, government, and private institutions, but such studies are unlikely to provide reliable dictates in the short term.


118. Id.
1. **Retrofit Devices**

The most obvious measure for mobile source control is required installation of exhaust retrofit devices on California's twelve million used cars. The Air Resources Board is expressly authorized by state law to effect such a measure, and the statutory enforcement mechanism has been in existence for several years.\textsuperscript{110} Yet several times the Board has attempted to require the installation of exhaust emission retrofit devices and each time it has been forced to suspend its action.\textsuperscript{120} Several of the problems discussed previously are present here. It would be difficult to develop a device that worked on a large number of cars because of the wide variety of automobile designs. Also, if patent protection could not be assured, innovators would be discouraged by price- undercutting competitors who had not incurred development expenses.

A cost effectiveness dilemma also arises. The number of cars of any given vintage diminishes each year. Thus, in the inevitable time lag between the proposal of a regulation and its effective date, benefits gained from the retrofit devices decrease as development costs are incurred. The problem is further compounded because ultimately it is the poorer segment of the community that will bear the extra costs of pollution control devices, since it is they who own the older vehicles.

This question also brings an additional difficulty into our discussion, — namely developing the level of confidence necessary for promulgation of even modest rules. The particular reason for suspending the retrofit requirement was fear that some of the devices would cause valve damage to some categories of engines under certain conditions.\textsuperscript{121} Thus the decisionmaker had to choose between not acting at all and

\textsuperscript{119} CAL. HEALTH & SAFETY CODE § 39129 (West 1973).

\textsuperscript{120} A region-wide exhaust retrofit program was expected to start as early as March 1973. Cal. Air Resources Bd. Bull., Nov. 1972, at 3, col. 2. A regulation (13 CAL. ADM. CODE § 2008 (1973)), requiring installation of such devices on a statewide basis was passed in November 1972, with an effective date of July 1, 1973. Cal. Air Resources Bd. Bull., Dec. 1972, at 1, col. 2. On June 7, 1973, the effective date was suspended until October 1, 1973. Cal. Air Resources Bd. Bull., June-July 1973, at 1, col. 2. In September the ARB took action to reactivate the program January 1, 1974. Id., Sept.-Oct. 1973, at 1, col. 1. In December 1973, faced with the energy crisis, the ARB suspended the program until April 1, 1974. 13 CAL. ADM. CODE § 2008(a) (1973). On June 27, 1974, the ARB suspension was ordered vacated by the California Supreme Court in Clean Air Constituency v. California State Air Resources Bd., 11 Cal. 3d 801 (1974). Since installation of retrofit devices does not become a condition of reregistration until the second year of the program's operation, the program will not have an effective enforcement mechanism, as it now stands, until 1976. A more limited retrofit program for 1966-70 vehicles, requiring the installation of such devices in certain counties upon initial registration or change of ownership, has been put into effect, effective October 1, 1973. Id. For further developments in the retrofit program, see The Automobile Controversy, supra note 49.

\textsuperscript{121} L.A. Times, June 8, 1973, § 1, at 3, col. 5. The fear of valve damage dissipated by September 1973. See note 120 supra.
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acting in a manner that might produce conjectural benefits and serious damage as well. In such circumstances it is not unreasonable to choose to avoid the risk.

2. Fuel Conversion

Another regulatory measure that is often suggested is requiring conversion of existing automobiles to operate on gaseous fuels such as propane or natural gas. Conventional engines can indeed be modified to operate on such fuels. The cost of the modification would be on the order of several hundred dollars, and would undoubtedly decrease if massive conversion occurred. The argument in favor of this technological change is that engines operating on such fuels, when properly adjusted, produce much less pollution than do engines burning conventional petroleum fuel. In addition, the modified engine is simpler than conventional engines, and can be operated at lower fuel and maintenance costs, potentially offsetting some or all of the cost of converting the vehicles. Also, vehicles could be converted to operate as "dual-fuel" vehicles so that the family car, for example, could operate on gaseous fuels for city driving in a high pollution area and on petroleum for inter-city trips, vacations, etc.

Why then wasn't a regulation requiring fuel conversion promulgated long ago? One reason is the difficulty of creating a new infrastructure, or of modifying the existing one to distribute large quantities of a fuel with handling characteristics quite different from those of gasoline. Compulsory conversion, unless accompanied by an adequate distribution system for gaseous fuels, would be politically unacceptable. Fuel suppliers would hesitate to make massive capital expenditures to construct needed facilities without high confidence that the regulatory authorities would not ultimately relent.

An additional problem involves the availability of natural gas in Southern California. In the summer of 1972 the projected natural gas supply was insufficient to satisfy both existing needs and the power

122. In 1972, the Mayor of Riverside proposed to the Governor that all vehicles in the Air Basin be converted to abate the Riverside crisis. The Air Resources Board held hearings on the proposal in Los Angeles, August 17-18, 1972 [hereinafter cited as Conversion Hearings]. Partial conversion was an element of the Administrator's original plan for Los Angeles. Proposed regulation § 52.229(L), 38 Fed. Reg. 2198 (1973). See also EQL Report, supra note 101, at 64-77.

123. See EQL Report, supra note 101, at 67-72. Gaseous fuel also has performance disadvantages; the necessary storage tanks take up a considerable volume of space and increase the weight of converted cars. Adverse safety considerations have also been raised. Compare statement of F.W. Bodwitch at Conversion Hearings, supra note 122, with EQL Report, at 72-75.

124. See statement of John M. Hopkins, Union Oil Co., at Conversion Hearings, supra note 122.
demands of a large number of vehicles. However, at least theoretically, gas could be released from present uses to provide fuel for vehicle fleets such as taxicabs and delivery trucks. Such fleets add pollution out of proportion to their numbers because they operate many hours daily in highly polluted urban areas. In addition, such fleets either now use central service and fueling facilities, or could construct them rather easily, thereby reducing infrastructural problems. Therefore, a regulation requiring conversion of such fleets is an attractive measure.

Such a reallocation of fuel, however, could not be effected by the Air Resources Board. Because it is a fuel that can be burned comparatively cleanly, one of the principal "interruptible" uses of natural gas is to generate electricity. If natural gas were reallocated to automobile fuel use, some new higher pollution and higher cost fuel would have to be substituted for electricity generation. The net result might be a pollution saving on balance, but such a solution would require action, not only by the ARB but also by the relevant local APCD's, the State Public Utilities Commission, and possibly by the Federal Power Commission. Indeed, since we are now turning to foreign sources of liquefied natural gas, the delivery of which is said to require new tankers and deep water ports, approval might also have to be obtained from the State and Defense Departments, and from federal and state authorities concerned with coastal resources, marine transportation, and


126. See EQL Report, supra note 101, at 64-77. Senator Bielenson introduced such a measure in the state legislature, but it failed to pass. See note 57 supra.

127. See statements of W.H. Seaman, Southern Cal. Edison Co., at Conversion Hearings, supra note 122. The use of a higher cost fuel for power generation means that the costs of this measure would be distributed to some or all electric power users, not only to those who converted their vehicles.

The testimony at the conversion hearings, and documentary materials prepared in the summer of 1972, naturally assumed that other fuels would be available to generate electricity if natural gas were diverted for automotive use. Subsequent events, including an FPC action to increase natural gas supplies to the Midwest, and a marked increase in the power-plant fuel-oil demand, together with the Arab oil embargo, obviously render much of the conversion hearing testimony inapposite.

128. Sulfur dioxide pollution would probably increase while carbon monoxide, oxidant, and nitrogen dioxide pollution would decrease. The former problem, however, was much less severe in the air basin than was the latter. See Statement of George W. Milias, Deputy Regional Administrator, EPA, at Conversion Hearings, supra note 122; but see statement of Robert Chass, Air Pollution Control Officer, L.A. APCD, id.

The recent shortage of low-sulfur fuel oil for the area may have materially reduced the relative pollution advantage predicted for such conversion, since local power plants might have to burn high-sulfur fuel instead.

129. The Los Angeles APCD emphasized the practical difficulty, or even impossibility, of total conversion. See Statement of Robert Chass at Conversion Hearings, supra note 122.
on and on. So once again, we find that no agency, not even the EPA with its extraordinary powers under the Clean Air Act, can deal comprehensively with the situation.

The gaseous fuel proposal presents another problem which arises in the context of the new federal automotive emission standards. Gaseous fuel vehicles or other supposedly low pollution vehicles can under certain circumstances operate at very high levels of pollution.\(^{130}\) The present infrastructure of automobile servicemen, gas station attendants, mechanics, and garage owners have not been trained to tune automobiles for low emissions, and there will be a time lag before the necessary equipment and skills are widely distributed in this highly decentralized industry.\(^{131}\) More important, there will be penalties in the form of relatively poor performance characteristics and fuel economy, if automobiles in fact are operated and maintained as low pollution vehicles. Stating the proposition more negatively, car owners will have incentives to have their cars tuned not for low pollution, but for high performance or high fuel economy.\(^{132}\) To some extent, garage operators and mechanics will be able to accommodate their customers to "fix" the vehicles to make them more satisfactory. Thus, the troublesome implications of mandatory technological measures cannot be confined even to the broad technical, economic, and jurisdictional difficulties suggested earlier.

Thus arises the prospect of statewide inspection of all vehicles.\(^{133}\)

\(^{130}\) "[N]ot uncommon malfunctions can easily increase the emission level of [post-1974] cars by several thousand percent." Easterling, Periodic Motor Vehicle Inspection as a Smog Abatement Measure in the South Coast Air Basin, EQL Memorandum No. 2, Jan. 1973, at 20. Even gaseous fuel cars can, as a result of malfunction, maladjustment, or other improper operation, produce excessive carbon monoxide or other pollutants. \textit{Id.} at 16.


\(^{132}\) NAS REPORT, \textit{supra} note 131, Jan. 1, 1972, at 35.

Establishing a state operated mechanism, however, would increase state taxes and the size of state government, and perhaps would have the state government do something private industry could do more efficiently. A private enterprise mechanism, on the other hand, raises the spectre of possible corruption. Of course, any such mechanism involves additional cost and annoyance to all motorists. These questions, for once, have implications that can be foreseen, but they cannot definitely be resolved by the Air Resources Board. They clearly present issues of public policy which go beyond the mandate of an agency that has only the responsibility to investigate technological matters. Such questions should be resolved by the state's political leaders.

Indeed, the state's political leadership could conclude that the foregoing problems suggest the need not for a policing measure, but for some economic mechanism to counter-balance the economic disincentives accompanying the technological regulations. A highly particularized emissions tax, for example, based on the number of miles driven by each driver and the emission characteristics of his vehicle, could permit each individual to adopt his own solution. He could convert his engine to propane, drive less, replace his old vehicle, keep his car tuned for low emissions, or pay the tax, whichever solution was most compatible with his individual values, resources, and capabilities. If society wanted lower emissions, it could simply raise the tax. Perhaps a less particularized emission tax would be more appropriate in view of the difficulty of administering a highly particularized tax. A less particularized tax could still reward broad categories of desirable conduct, such as trading in old cars or converting to gaseous fuels. Obviously, these solutions also present policy choices which are appropriately made in our system only by its political leadership. But, of course, the state's political leaders should be dealing with all the problems raised by air pollution. Indeed, this author contends that one of the principal reasons more progress has not been made in cleaning the air is that we have tried to divorce administrative implementation from political leadership on questions where they cannot sensibly be separated—but more of this discussion later.

3. Transportation Alternatives

Both EPA and ARB have proposed regulations to make private automobile transportation increasingly less attractive. Regulations have included suggestions for imposing additional taxes on gasolines, for rationing gasoline, and for eliminating parking spaces in congested...
However, unless such actions are accompanied by viable public transportation alternatives, the disruption they would cause would make them politically unacceptable and thus ultimately incredible.

The problem here is that there is no consensus as to how an alternative to our present automobile-based transportation system should be financed or constructed. For example, the most commonly suggested alternative is to construct a fixed-rail rapid transit system. The agency in the Los Angeles area that would deal with this is the Southern California Rapid Transit District (SCRTD). However, the SCRTD cannot act without funds and neither the Air Pollution Control District, the Board of Supervisors, the State Air Resources Board, nor EPA can provide such funds. Such funds can come only from Congress, the state legislature, or from the voters, who rejected the most recent proposal submitted to them.

Moreover, a fixed-rail system would take at least ten years to construct, during which time the construction itself would probably add to traffic congestion and intensify our air pollution problems. Staggering engineering problems are encountered in designing a system that combines high average speed, enough stops for easy access, and a minimum of waiting time and transfers, all at tolerable capital and operating costs in a low density city. The long lead time required for construction of a fixed-rail system also means that the voters must have confidence that the plan will be desirable for the city. Whether a fixed-rail system was well planned becomes apparent only when the system is operational, ten to fifteen years after approval. Then, of course, it will be too late to do much about it.

Even if a rapid transit system could be financed in a short time, the implications of such a system are themselves profound. The most


137. The Administrator has proposed a parking surcharge, proceeds of which would go to mass transportation purposes. See text accompanying notes 84-86 supra. However, his authority to impose such a tax is highly questionable. His sole claim of authority is his command to promulgate substitute air pollution control plans for those plans, or parts thereof, which he disapproves under § 110(c) of the Act. There is no explicit authorization for the Administrator to impose local taxes, and certainly no compelling evidence that Congress intended so startling a departure from traditional norms. Moreover, even if Congress had clearly so intended, such result is susceptible to constitutional challenge.

138. A bond issue, Proposition A on the June 1968 ballot, was defeated by a vote of approximately 55% to 45%. A vote of 60% was required for passage. L.A. Times, June 7, 1968, pt. I, at 20, col. 1. A sales tax measure, Proposition A on the November 1974 ballot was defeated by a vote of approximately 54% to 46%. A majority vote was required for passage. L.A. Times, Nov. 7, 1974, pt. I, at 24, col. 7.
obvious implication is that a fixed-rail mass transit system might lead to a high density land use pattern following the lines of the rapid transit system. This would foster the kind of crowded environment which many sought to avoid when they migrated to Southern California. In addition, we Southern Californians may be so enamored of the privacy, convenience, and flexibility of the automobile that we will be as unwilling to use a rapid transit system as we are now unwilling to tolerate the inconvenience, crowding, and slow pace of the present bus service.188

Perhaps the answer lies in other forms of transportation alternatives. Recent experiments have tested subscription bus service, local dial-a-bus systems, and an exclusive eleven-mile busway from El Monte, a suburban community, to downtown Los Angeles. The Administrator's November 12, 1973 plan required creation of an extensive system of exclusive bus and/or carpool lanes, and computer services to facilitate use of carpools.140 Participation is likely to remain low until convenient public transportation becomes so widely available that families can get by with only one car. Until that rather high threshold is reached, families which own one car per adult will continue to incur the fixed costs of car ownership, and will naturally prefer to use the cars they own rather than a public transportation facility.141 Thus, it will be very difficult to evaluate the success of such experiments in Los Angeles because people in Los Angeles are not used to thinking about public transportation as a viable alternative.

VI

A SECOND EVALUATION OF THE ACT

In view of the difficulties described above, it is not surprising that the implementation plan submitted by the state of California failed to

139. A study prepared for EPA concluded that an "ideal" rapid transit system that travelled as fast as a private car and had a free fare would increase transit ridership only 15% and reduce vehicle miles traveled by only 10%. TRW Transportation and Environment Operations, Transportation Control Strategy Development for the Metropolitan Los Angeles Region, Dec. 1972, at 153-54, E-11. Local public agencies claim that the severe transportation restrictions proposed by EPA (excluding 100% gas rationing) would increase mass transit and car pool ridership by only 4%. Clean Air: The Local Agencies' Plan for the Los Angeles Air Basin, Aug. 1973, at 8.


141. The prospect of gas rationing is forcing Southern Californians to consider the possibility of carpooling, using public transportation, and eliminating unnecessary driving. If indeed we are forced to get by on substantially less gasoline than we are used to, and if we discover that the necessary adjustments are not all that onerous, public opposition to transportation restrictions may be replaced by support for short-term improvements in public transit facilities, possibly bringing cleaner air to Los Angeles faster than anyone had predicted.
solve the state's air pollution problems. The fundamental obstacle is that we, as residents of the South Coast Air Basin, the State of California, or the nation, have no clear notion of the nature, magnitude, or distribution of the costs necessary to achieve any given level of substantially better air quality. *A fortiori*, we do not have a political consensus that the benefits are worth the burdens, or perhaps more accurately, that the hope of future benefits is worth incurring substantial and painful personal burdens now. In such circumstances, any administrative mechanism will necessarily fail to produce a radical improvement in air quality, unless and until we achieve political consensus in favor of bearing the short term burdens.

In retrospect, it now appears that the most inadequately considered provision of the Act was that calling upon states to undertake a planning process to implement the Act. The formulation of a state plan is a much more difficult process than it would seem on first appearance. It is easy enough to visualize a state health officer planning a program for the control of some disease, or even a state division of highways planning a system of freeways within the context of an express or implied mandate from the state legislature. It is not clear, however, how a state agency can formulate a plan that necessarily embodies very sensitive and profound policy judgments. Thus, the State's Air Resources Board was capable of providing an intelligent discussion of the problems of the state's air basins and of the most prominent proposals for additional improvement, but such an agency could not meaningfully speak for the state in resolving the major questions of public policy relative to the problem of air pollution. Planning in this sense should be a product of the legislative process.

The problem in California was intensified because the structure of the "planning agency" discouraged political leadership. The part-time board members lacked either personal political effectiveness or meaningful relationships with elected political leaders. Nor is leadership likely to come from the agency's professional staff unless the staff is specifically selected to play such a role in the context of strong support from elected leaders.

Thus, at least for states with difficult problems, the state implementation plan alone could not meaningfully do more than summarize existing state and local regulations and determine whether the aggregate effect of the federal, state, and local programs would meet the standards of the Clean Air Act. More would be possible only if, by coincidence, the state's political leadership developed an air pollution

142. The discussion was in no way comprehensive. No mention was made of the problems involved in planning to prevent "emergency air pollution episodes," or of the problems of motorcycle or of aircraft emissions, among others.
plan within the time frame of the Clean Air Act. Such fortuitous timing of political leadership could have been hoped for, but not realistically expected.

Moreover, the sequence of events mandated by the Act was not well suited to development of meaningful state plans for areas with serious air pollution problems. The political process of developing such plans was likely to begin in earnest only when it became clear that existing legislation was inadequate to meet the Act's standards. But such facts were unlikely to come to public attention until the state's expert air pollution agency completed its analysis and the results were reviewed by the Administrator. At that point, however, the state had only 60 days to act before the Administrator promulgated his plan. Within that time, resolution of serious and difficult questions of public policy was impossible. Thus California may have complied with the requirements of the Act about as well as could have been expected.

The Administrator's position was no more enviable. It was unwise as a matter of strategy and of public policy for him to make determinations for the states. The Administrator is not responsible to any electorate, and therefore should not attempt to make policy judgments profoundly affecting many individuals and our society as a whole. In terms of strategy, the Administrator would be unwise to provoke direct challenges to his authority. His authority to promulgate land use restrictions for Riverside County for example, or to deal with air pollution in an intrastate air basin is, to say the least, open to question.

On the other hand, the Administrator could not defer in the hope that state resolution of the difficult political questions involved would be forthcoming. The Administrator is simply unable to know whether proposals put forward by the Air Resources Board or others are or are not in accord with the policy judgment of the state's political leadership. The Administrator's goals would be furthered much more effectively, if he could somehow coerce the states into resolving the policy questions involved. As noted above, however, time limitations of the Act precluded any effective use of such a potentially powerful process. The Administrator had no credible weapons to force state political

143. Requiring implementation plan preparation did have a number of beneficial effects, of course, such as compelling establishment of air quality monitoring systems. 40 C.F.R. § 51.17 (1973).
144. See text accompanying note 17 supra.
145. The legislative history of the Act does not manifest an unequivocal congressional intention to depart dramatically from traditional patterns of authority, and even if it did, such a congressional intention might be susceptible to constitutional challenge. Such a challenge would determine whether there remains any limit on congressional power to legislate under the commerce clause.
146. See text accompanying note 120 supra.
action, and he was forced to promulgate his own plan reflecting his own judgments.

When the Administrator adopts such a plan, however, he runs squarely into the other fundamental problem bedeviling air pollution control efforts—the lack of credibility. But the lack of credibility is simply another result of the absence of a political consensus supporting the proposed action. The reason regulatory measures lack credibility is that their enforcement appears to be politically infeasible. Surely, reasonable people would believe, for example, that the Clean Air Act would be amended before they would believe that gasoline supplies would be cut off to the Los Angeles metropolitan area.

Thus, in this author's view, the fatal flaw of the Clean Air Act was its failure to integrate political leadership into the implementation process. I use the term "integrate" because the need is not simply to build political support for one particular solution. No single solution can be confidently foreseen as effective at this time. The most we can do is to take one step at a time toward pollution control, while trying to develop the requisite vision and capacity to take the next. What is necessary is an ongoing iterative process of administrative implementation and political leadership. In such a process political leadership could play the role of mobilizing support for specific public sacrifices. It could also facilitate additional sacrifices by establishing subsidies or other measures to reduce the burdens. For example, the Clean Air Act stimulated some automakers to develop low emission cars. However, it appeared that they would succeed only in developing subcompact low emission cars by 1976.\textsuperscript{147} American automakers would resist converting their resources to manufacture low emission vehicles if such cars would be smaller and less powerful than those which American consumers seem to prefer. At this point, political leadership in an iterative process might have led a campaign of public education as to the desirability of sacrificing large, powerful cars in return for cleaner air. Once public support developed for such a cause, then credible new legislation might be passed compelling manufacturers to phase out the production of large, powerful cars unless low emission technology were quickly developed.\textsuperscript{148}

Similarly, a role for political leadership in regard to rapid transit, would be to try to obtain federal funding for a dramatic short term im-

\textsuperscript{147} Honda and Mazda are the two prime examples. \textit{See} discussion, Decision of the Administrator, 38 Fed. Reg. 10326 (1973).

provement in the public transportation system,\textsuperscript{149} without waiting for construction of a totally new fixed-railed system.\textsuperscript{150}

The process bears less resemblance to the traditional administrative role of implementing a legislative mandate than it does to a well-managed political campaign in which strategy and tactics are continually reviewed and revised as new issues develop. Indeed, if one thinks in terms of devising a strategy to bring about pollution control rather than creating an administrative agency to do it, one can analyze more clearly the convergence of independent elements that will be necessary to bring it about. One also can consider scenarios of various tactics designed to produce such convergences. Even better, one can consider employing multiple tactics simultaneously since the results of some tactics undoubtedly will be disappointing while others may prove more effective than anticipated. For example, a strategy that relies entirely upon a technological breakthrough obviously is inferior to one that not only encourages a breakthrough, but also hedges its bets with alternative tactics.\textsuperscript{151} Indeed, the tactics of direct regulation of technology or of requiring satisfaction of fixed standards by a certain date may be less effective than strong and well directed economic incentives and disincentives. No administrative process independent of political leadership has the ability to tailor such positive and negative weapons to changing situations.

The relevant question now is how to integrate political leadership into the implementation process, or, more precisely, how to improve such integration, which, at present, is slow and clumsy. For example, political leadership became involved in the process when earlier legislation proved to be ineffectual,\textsuperscript{152} and it will again become involved because the Clean Air Act proved too forceful to be acceptable. However, the time lag of the legislative process, compounded by the additional time required for public and private institutions to respond to legislative changes, tends to make this political interaction cumbersome and ineffectual. In addition, when legislation designed to exert pressure for substantial technological and economic change is not revised until it becomes clear to all concerned that the existing legislative scheme is unworkable, then legislative leadership loses the very credi-

\textsuperscript{149} Mayor Bradley has begun to do precisely this. \textit{L.A. Times}, Aug. 2, 1973, pt. II, at 1, col. 3.

\textsuperscript{150} The current proposed fixed-rail rapid transit system is estimated to take 12 years for construction, if and when it is approved by the voters. \textit{RAPID TRANSIT DIGEST}, July 1973.

\textsuperscript{151} The best approach in developing such a strategy known to this author is outlined in the EQL Report, \textit{supra} note 101. This report discusses elements of technological and economic strategy as they appeared in 1970; it does not attempt to deal with questions of political strategy.

\textsuperscript{152} See note 9 \textit{supra}.
bility that should be its most important contribution to the process. Thus, the ability to respond more quickly, flexibly, and effectively is an essential element of effective implementation.

One method of bringing about such increased political interaction is to lodge in the executive branch broad and flexible authority to shape remedies and rewards. Perhaps the executive could also be authorized to devise strategies and tactics for coercing progress from public and private institutions. However, such broad discretion to act on matters with profound social and economic consequences involves a concentration of power that carries with it very great risks. It should not be necessary to take such measures to increase the integration of political leadership into the implementation process.

This author has one concrete suggestion for facilitating the movement of political leadership into the implementation process, and that is to improve the legislature's ability to act quickly and flexibly. My suggestion is that legislation such as the Clean Air Act should specifically authorize a procedure permitting amendment merely by action of a specifically designated joint legislative committee, perhaps with a proviso that such an amendment would be subject to veto by a two-thirds vote of either house. Then Congress could act quickly and flexibly enough to keep pressure on industry and public agencies as circumstances change. The present approach to maintaining such pressure is to mandate very severe performance requirements on a near-impossible time schedule. But such an approach has forced the Administrator into untenable positions. As a result, it became apparent that some

153. The establishment of a procedure designed to facilitate the active involvement of the legislature in the implementation process may invite testing of the constitutional limitations of the legislative process. The proposal for simplified “amendment by committee” might stimulate objections about encroachment by the legislature into the constitutional sphere of the executive, cf. Authority of Congressional Committees to Disapprove Action of the Executive Branch, 41 Op. Att'y. Gen. 300 (1957), and about impermissible delegation of legislative authority to a committee, cf. Authority of Congressional Committees to Disapprove Action of the Executive Branch, 41 Op. Att'y. Gen. 230, 231 (1955).

The defense of such a procedure would be that the Constitution does not require the Congress to organize only in the traditional manner or to conduct its business only under specified rules, save only for certain basic norms such as that the concurrence of both houses be obtained for any legislation, and for certain extraordinary circumstances such as impeachment of a President.

Without attempting to explore exhaustively such questions it seems evident that the likelihood of such an innovative procedure passing constitutional muster would be enhanced if the discretion vested in the committee were as narrow as possible. In addition, the procedure should be structured so that the committee's role resembles, as closely as possible, the traditional role of the legislature to resolve questions of public policy through legislation rather than the executive role of enforcing legislation, cf. Springer v. Philippine Islands, 277 U.S. 189 (1928). Amendments by committee would have no higher dignity than amendments enacted by the conventional process, and thus would be subject to Presidential vetoes.
congressional amendment would be needed, and, since congressional action is so slow-moving and unpredictable, prudent men have balked at taking the statutory mandates seriously. If a single committee, however, could quickly resolve arguments, and if its leadership acted with a sufficiently fine hand and with sufficient political skill to develop political credibility, then prudent men would have no choice but to take seriously its intentions.\footnote{154}

This suggestion obviously is not a panacea. A simplified amendment procedure might result in the further enlargement of already too large powers of congressional committee chairmen selected by seniority,\footnote{155} and committee members would in the future increasingly be subjected to all the subtle and unsubtle pressures which tend to cause administrative agencies to be captured by the forces they are supposed to regulate. Critics of the AEC, for example, find little comfort in the ongoing review of AEC activities by the Joint Congressional Committee on Atomic Energy.\footnote{156}

The importance of the specific suggestion, however, is not as an ultimate solution but only as a point of departure for serious thinkers to consider appropriate reforms. Indeed, it is not clear that any structural change is necessary.\footnote{157} The House Ways and Means Committee, for example, has somehow managed to operate with the credibility, flexibility, and, on occasion, speed, that is missing with respect to air pollution control.

Moreover, structural reform can only facilitate responsible political involvement, it can not guarantee it. It will always be possible for political leadership to undermine the implementation process, either by attacking unpopular regulations promulgated by the Administrator or by insisting upon impossibilities that force him into untenable and powerless positions.\footnote{158} Thus, we ultimately are dependent on the quality

\footnote{154. Naturally, such a reform would be pointless unless accompanied by other measures to equip congressional committees with independent sources of expertise and critical evaluation of the highest competence and integrity, but perhaps the development or expansion of such congressional resources would be facilitated by the structural reform I have suggested.}

\footnote{An additional benefit of such a reform would be to make some person or well defined group politically accountable to its electorate for the direction and progress of air pollution control activities. At the present time, power is so diffused that no one is responsible for lack of progress. Under the present structure, even when public sentiment is aroused or outraged, it is almost impossible for political activists to win victories that lead to meaningful action because it appears that no one is powerful enough to do anything.}

\footnote{155. Reforms increasing the directly visible power of congressional committees might conceivably increase pressure to change the manner in which committee chairmen are chosen, or the manner of operation of congressional committees.}

\footnote{156. See, e.g., \textit{Metzger, The Atomic Establishment} (1973).}

\footnote{157. One question urgently in need of serious study is the relationship between the structure of a government agency and its ability to provide leadership.}

\footnote{158. Advocates of clean air were not encouraged by the improvement of political
of our political leadership; if it should prove inadequate, no structural reform can suffice.

It will, of course, be necessary to devise new strategies and tactics that are compatible with this kind of integration of administrative implementation and political leadership. One such strategy is suggested by Cal Tech's Environmental Quality Laboratory. This is to adopt statutory management standards rather than uniform standards of absolute air quality. The management standards approach would, for example, first divide the country's air basins into different categories, based on the number of days per year in which ambient air quality standards are exceeded. For each pollutant, the highest category might include air basins in violation between 50 and 99 days; the next, those in violation between 25 and 49 days; the next, those between one and 24 days; and finally, those with satisfactory air quality. An air basin might, of course, be in the highest category with respect to one pollutant and in the lowest category with respect to another. Management standards would then be established for each category, which would be expressed as a percentage reduction in the number of days per year of violation of the applicable air quality standard. For example, category I regions might be required to reduce their number of days of violation by 80 percent in four years, 90 percent in seven years, and 95 percent in ten years. Perhaps a category IV region could be expected to improve its air quality by 35 percent in four years, 60 percent in seven, and 80 percent in ten.

Such an approach offers a number of advantages. First, it might lead to an allocation of resources and energies to those areas with the most severe problems, rather than a helter-skelter allocation as all areas strive to meet exceedingly difficult, if not impossible, air quality goals. Secondly, it recognizes that the cost and disruption incurred in improving air quality increase as air quality improves. A region may reduce its days-per-year of violation from 200 to 175 with substantially less cost and difficulty than it will later experience in going from 50 to 40 days. Once the larger pollution sources are brought under such control as is technically and economically feasible, each incremental improvement becomes successively more expensive and difficult to achieve.

More important, the management standards approach can incorporate precisely the kind of iterative review that is necessary to make continued progress. An initial implementation plan for attaining all milestones could be formulated at the outset by state and local authorities and reviewed, and perhaps modified, by the Administrator, liaison between the ARB and the Governor's office effected by Governor Reagan in December 1973, when he replaced four of the five board members, presumably with people whose views were similar to his own.

159. EQL Report, supra note 101, at 40-43.
just as implementation plans have been reviewed and modified under the Act. The initial implementation plan could, however, be reviewed periodically so that projected progress could be compared against actual experience. As a result of such review, the plan could be revised, and perhaps substantially rewritten, to take account of knowledge gained through early efforts within the subject air basin and other air basins with similar problems throughout the country. If, as is likely, initial steps prove disappointing, the successively revised plans would have to become increasingly severe, the management standards relaxed, or the timetable extended. As our collective experiences in many air basins accumulate, an intelligent political judgment could be made whether to relax or strengthen the standards. It is precisely this form of built-in feedback based on accumulating experience and education that is lacking in the present system.

Most important, an iterative process involving periodic public hearings on plans for meeting the series of implementation deadlines might facilitate the development of political support that is now so painfully absent from the implementation process. If, at each successive hearing, public officials addressed themselves to short-term and long-term measures, they and the public at large might become well educated as to the sacrifices each community would be required to make to attain clean air.160 As the discussion proceeds through a series of hearings, undoubtedly some political forces supporting ameliorative measures and reasonable compromises will develop, as, of course, will political forces serving more narrow or extreme interests. There is no guarantee that the most responsible and farsighted political forces will prevail, but the management standards approach makes it more likely that they will at least be heard.

In addition to new strategies, it will be necessary to develop new tools to stimulate technological development. Present patent protec-
tion may be simultaneously too broad and too narrow to stimulate effectively such development. It may be too narrow in the sense that reasonable businessmen will be unwilling to make substantial investments in developing ideas or techniques unless they can be reasonably assured that their development efforts, if successful, will be adequately rewarded. Thus, for example, the development of ideas that are already in the public domain, or otherwise unpatentable, would normally be economically unsound. Conversely, patent protection may be too broad in the sense that it is possible for large complacent companies to buy patent rights to stifle rather than to develop the underlying idea. In disputes in which credibility is so important, suspicion often arises that large companies proceed to develop new technology with the same deliberate speed used by school districts in implementing school desegregation. The companies, of course, deny such assertions, but there is no way at present to resolve satisfactorily the competing claims.\footnote{161. Section 308 of the Act attempts to stimulate technology by means of a mandatory licensing process under certain conditions. 42 U.S.C. § 1857h-6 (1970). For a critical discussion of this section see Schwartz, \textit{Mandatory Patent Licensing of Air Pollution Control Technology}, 57 \textit{Va. L. Rev.} 719 (1971). Regardless of the merits or shortcomings of section 308, however, the Act does not purport to deal with the problems described in the text.}

I have two embryonic suggestions for dealing with these problems. The first is that the Administrator be authorized to issue quasi-patents protecting pollution control devices or technologies which are substantial advances over the pre-existing state of the art, but which are not patentable. The devices or technologies for which such quasi-patents might be issued should be broadly defined so that the Administrator can encourage any form of technology developed that he deems appropriate. In my view, such authority should be highly discretionary so that the Administrator has the flexibility to provide industries with sufficient assurances and encouragement to develop technology he deems appropriate, while avoiding getting bogged down in endless quasi-patent proceedings. If the authority is so discretionary, it should be limited to a relatively short time span, say five years, and should, of course, be subject to mandatory licensing.

With respect to the second problem, perhaps a greater incentive could be provided for the very prompt development of patented ideas. My specific suggestion\footnote{162. The immediate source of this suggestion was Mr. Paul Kaplow, a 1974 graduate of the School of Law at the University of California at Berkeley. See also Riesenfeld, \textit{The New United States Patent Act in the Light of Comparative Law} I, 102 U. \textit{Pa. L. Rev.} 291, 321 (1954).} is that all transfers or exclusive licenses of patents or patent rights be terminable at the option of the inventor if the patented idea has not been developed or marketed at the end of a fixed period, say five years. The person with the greatest economic incentive in having the patent developed, the inventor, would...
thus have the power to prevent a large company from sitting on his idea. If the company failed to develop the idea, and if the inventor believed that others would do a more effective job, he could terminate his original license or transfer and enter into a new arrangement with a more aggressive developer. The inventor could elect not to terminate or could make a new deal with the original transferee, but he would only do so if he believed the developer would aggressively develop his idea.\textsuperscript{168}

These suggestions could present many obvious difficulties of definition and implementation. Like the other suggestions, they are intended merely as starting points for serious discussion and not as refined solutions.

\section*{VII}

\textbf{The Role of the Judiciary}

If the legislature or the executive must see its role differently in attacking air pollution and other such problems, what about the judiciary? Are existing doctrines adequate to recognize the flexibility needed to force action from public and private institutions? Should any more discretion be granted to administrative agencies because of these difficulties? Were the court decisions in \textit{Riverside v. Ruckelshaus},\textsuperscript{164} \textit{Natural Resources Defense Council v. EPA},\textsuperscript{165} or \textit{Sierra Club v. Ruckelshaus}\textsuperscript{166} obstacles to the development of political consensus? In the view of this author, such decisions helped to create consensus, because they sharpened political questions inherent in the problem and therefore brought pressure on political leaders to face them. If law is to be used as a tool to force progress, then it is necessary to enforce the law not only to make such a tool effective but to bring to the attention of the appropriate policymaker the problems that prior policy decisions have raised. Undoubtedly, some such decisions will lead to a retrenchment or postponement in the pursuit of certain goals. Perhaps \textit{Sierra Club v. Ruckelshaus}, for example, will lead to a declaration that it is the intention of Congress to permit degradation of the pure air in the country so long as national secondary standards are not violated. But some such decisions are inevitable in an iterative process that is aggressive enough to pressure action from private industry and public agencies.

\textsuperscript{163} The inventor would be willing to make a deal with a nonaggressive developer only if he believed that the payment he received would exceed the value of royalties he would receive if the idea were developed. Thus, the possibility of buying patents to sit on them is not absolutely precluded, but the economics would be changed drastically in favor of the development of new technologies.

\textsuperscript{164} 4 ERC 1728 (C.D. Cal. 1972).

\textsuperscript{165} 475 F.2d 968, 4 ERC 1945 (D.C. Cir. 1973).

In this context, the most troublesome decision is *International Harvester Co. v. Ruckelshaus,* which remanded for further consideration the Administrator's initial refusal to grant a one-year extension of the 1975 auto emission standards. The Administrator had declined to grant the extension because no showing had been made that the requisite technology was not available; therefore he could not make the finding required by section 202(b)(5)(D)(iii) as a prerequisite to such a suspension. In reviewing the Administrator's decision, the court undertook a detailed review of the technological methodology and assumptions used by the Administrator, considered in the light of the contentions made by the automakers, and a report of the National Academy of Sciences prepared for the Administrator on this subject. The court concluded that the automakers had made a prima facie case that the necessary technology was unavailable, based upon the only available data—their own testing. It also concluded that the Administrator had not supported his finding that the necessary technology would be available in time for production of 1975 models with "a reasoned presentation of the reliability of a prediction and methodology," sufficient to satisfy his "burden of proof" to overcome a prima facie case in a matter where the risks of an erroneous decision were so great.

In reviewing this decision, the court faced the not uncommon difficulties of avoiding substitution of its own judgment for that of the Administrator and of avoiding the temptation to place the burden of proof on questions of inherent uncertainty against environmental values. It also faced the infinitely greater difficulties of reviewing administrative decisions under statutes designed to force technological progress. In such circumstances the Administrator is, by definition, attempting to force technological development that may be impracticable or even impossible. Thus, if the Administrator is aggressive, there will always be evidence that his judgments are conjectural and not supported by the available data since advances in the state of the art can be made only by attempting to extend the scope of the possible. Yet, if the courts

167. 478 F.2d 615, 4 ERC 2041 (D.C. Cir. 1973).
170. 478 F.2d at 641-47, 4 ERC at 2055-60.
171. NAS REPORT, supra note 131, Jan. 1, 1972.
172. 478 F.2d at 647, 4 ERC at 2060.
174. The Administrator's decision apparently would have prohibited all sales of light-duty vehicles by International Harvester in model-year 1975. 478 F.2d at 638, 4 ERC at 2053.
were deferentially to affirm every strict regulation based on a more-or-less plausible evaluation of future developments, they would provide no protection against arbitrary and economically devastating administrative rulings. Thus, the proper scope of judicial review is a rather subtle question. Since the Administrator's discretion in such circumstances inherently involves judgments with which reasonable men will differ, I submit that the only valid test for judicial review of such measures is whether they clearly fall within the Administrator's mandate from Congress to force technological advances and if so, whether Congress acted within its constitutional authority. Perhaps the ultimate question for judicial determination is whether Congress has the constitutional authority to be, like many good negotiators, a little bit unreasonable.\textsuperscript{175}

Such constitutional questions need not be decided, unless the drastic decisions of the Administrator are supported by the clearest manifestations of congressional intent. Such clear manifestations of intent are unlikely to be found in the Act, however, since Congress has not acted with sufficient refinement to create economic penalties that can be imposed on selected high-pollution industries or companies without causing a wholesale economic disaster. Surely reasonable people would be reluctant to conclude that Congress intended an economic holocaust. Thus, the D.C. Circuit reasonably concluded in \textit{International Harvester} that Congress did not intend the Administrator to be quite so rough on the auto industry, and that his very strong stand should be reconsidered.\textsuperscript{176} Indeed, the Court had no reasonable alternative.

The \textit{International Harvester} decision does no greater violence to the formation of consensus than did the \textit{Riverside, Sierra Club}, and \textit{NRDC} decisions. They all force the appropriate entity, our political leadership, to address clearly the policy questions inherent in the air pollution problem, and they invite the increasingly more refined resolution of such questions that is necessary for further progress.

\section*{A Final Evaluation}

Finally, then, we come to the overall evaluation of the Act. We have seen that the Act did not come close to meeting its stated goals and that the substantive problems are so complex that the only apparent way to bring the Act and its goals into alignment is to lower those goals drastically. In the sense of conventional evaluations, the Act was a fail-

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\item 175. Perhaps Congress has more constitutional leeway to be unreasonable in establishing economic incentives and disincentives than it has in establishing outright prohibitions. For example, a heavy and annually increasing sales tax based on the pollution characteristics of new cars might be a less objectionable (and perhaps more effective) means of inducing technological progress.
\item 176. 478 F.2d at 648, 4 ERC at 2069 (D.C. Cir. 1973).
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\end{footnotesize}
ure. Yet, in strategic terms, the Act has been a surprisingly effective tactic. Today the public and our political leaders know much more about air pollution, its causes, and the cost of correction than they did before passage of the 1970 legislation. No alternative tactic, such as a federally-funded research and education project, could have produced such a wide dispersal of information. We have learned that there are no quick and cheap solutions, and we may have begun the process of coming to grips with the more difficult possibilities.

Moreover, our largest industries have responded to the Act's pressure and have begun to seek competitive technological innovations. In 1970 few would have predicted Detroit's current exploration of the Wankel engine, the stratified-charge engine, gaseous-fueled cars, and other pollution control technology. On balance, even though the Act fell far short of its articulated goals, it may have been a brilliant success as a first step toward dealing effectively with these problems.

We have also learned that there are limits to the effectiveness of any regulatory process that deals only with technology to the exclusion of economic and political realities. Our problem now is to devise effective means to force public and private institutions to take further steps, the necessity of which has become apparent, and to learn how, more quickly, effectively, and inexpensively, to cause successive steps to be taken in the future.