



LINCOLN JOURNAL

Taking the Pulse of Pennsylvania

SPRING 1997

INSIDE THIS EDITION

Surveys

- 1 *Public Opinion Court*
- 3 *Clinton, Greenspan Popularity Ratings*
- 5 *Household Money Supply Index*
- 6 *Keystone Business Climate Survey*

Marketplace of Ideas

- 2 *Chairman's Corner Lowman S. Henry*
- 11 *Lincoln Log InSTITUTE News*
- 12 *Product Liability Sen. Dan Delp*
- 13 *A Bitter 'Green Giant' James Milner & Chris Nicholas*
- 14 *"We The People" Albert Paschall*
- 15 *New Regionalism Dr. Charles Rubin*

Clean Air Redux

EPA Seeks Stringent New Air Pollution Regulations

By Charles L. Kennedy

"They're Baaack!!" was the oft-quoted popular refrain from the hit movie of several years ago, *Poltergeist II*. The same two words aptly describe the dread and fear of many in the business community over the proposed regulations to toughen the Clean Air Act of 1990. These regulations have again been submitted by Carole Browner, the chief administrator of the U.S. Environmental Protection Agency (EPA).

The regulations were originally proposed in 1994 and ignited a firestorm of public opinion in opposition. This opposition was also manifest at the initial Lincoln Institute Public Opinion Court session which convened on December 3, 1994 in Valley Forge, PA.

The 1994 Court

The Public Opinion Court in 1994 sat in judgement on three major provisions of the Clean Air Act of 1990:

- The Act's requirement that all passenger vehicles be inspected once every two years at centralized inspection stations.
- The provision of the Act that would require all gasoline stations in southeastern Pennsylvania to begin selling Reformulated Gasoline (RFG) in 1995.
- The Employer Trip Reduction Program (E-TRIP), mandated in the Act, that would require large corporations to force employees to car pool or to use mass transit.

The Public Opinion Court which was

held in 1994 approved of the concept of clean air. Everybody does! The old saying, however, that the "devil is in the details" rang very true. The concept is good; the problem is with the implementation. The members of the panel considered these three major components of the Clean Air Act as more examples of excessive federal mandates:

1. These requirements adopted by the EPA are not the most cost beneficial nor cost effective means of obtaining clean air.
2. The burden imposed on average citizens in terms of cost and time are excessive.
3. The people are simply not prepared to

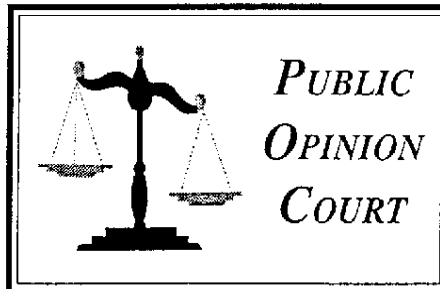
make the excessive trade offs in terms of time and money for the anticipated minimal improvement in the quality of the air.

4. The government must undertake more intensive cost-benefit and cost effective analysis before implementing all regulations.

The Current Controversy

The controversial requirements of these proposed regulations to the Clean Air Act of 1990 have again initiated considerable controversy over their impact and the need for their implementation. At a recent meeting of the National Governor's Association, the Governors were divided over the clean air standards being considered by the Environmental Protection Agency, refusing to issue a strong rebuke of the proposal as sought by some of the chief executives.

See "Public Opinion Court", Page 8



Public Opinion Court

'Faulty Science' Lies at the Heart of the Clean Air Act Debate

Continued from Page 1

Ohio Governor George Voinovich, a Republican, had argued that it was "critical" that the governors express their opposition to the EPA proposal. Others, led by New Jersey Governor Christine Whitman, also a Republican, argued that it was premature to criticize the proposal.

Finally, the Governors' Committee on Natural Resources issued a resolution that said little more than that the governors are "concerned about striking a balance" between protecting public health and overly burdensome regulations.

Now that "*they're baack*," the Lincoln Institute assembled its fifth Public Opinion Court, in King of Prussia, in February of 1997. The Public Opinion Court was comprised of a 13 member randomly selected panel, representing a cross section of southeastern Pennsylvania, including the counties of Bucks, Chester, Delaware, Montgomery and Philadelphia. The Public Opinion Court was assembled as a focus group to give average citizens the opportunity to have a discussion on a serious level and to have input on a major public policy issue.

The purpose of the Public Opinion Court was to give the average citizen as a randomly selected representative of the population, the opportunity to be heard, to speak out, and to have their vote recorded on an issue of major significance, in this case, the Clean Air Act of 1990.

As the Public Opinion Court assembled, the members took an "entrance survey". They listened to two presentations, engaged the presenters in a question and answer session, discussed the issues with each other, and concluded with an "exit survey". Presentations were made to the Court by two particularly articulate individuals: Jason Rash from the Delaware Valley Clean Air Council and Christopher Nicholas from the Pennsylvania Chapter of Citizens for a Sound Economy.

The Pro-Position

Jason Rash of the Clean Air Council emphasized the medical benefits which some proponents claim will occur if these new regulations are adopted -- they include a savings of \$120 billion per year in health care costs and a prevention of 40,000 premature deaths a year.

Rash reviewed the history of the 1970 Clean Air Act and its protection of public health provisions. He reviewed the 1977 and 1990 amendments. He noted that the EPA must conduct a five-year review and is mandated to develop new standards to protect the public health by reducing air pollutants. He emphasized the major air pollutants were ground level ozone and particulate matter. These pollutants cause the following health problems: asthma, a 15-20% reduction in lung capacity, reduce immune defenses, increased susceptibility to bronchitis and pneumonia, more illnesses in children, an increase in hospital visits, and increased emergency ward visits.

He also emphasized that the Boston, Philadelphia, Washington, D.C. corridor was one of the worst non-attainment areas

in the entire United States. Additionally, he claimed that the current regulatory standards are not protective enough of public health.

The Con-Position

Christopher Nicholas of Pennsylvania Citizens for a Sound Economy spoke in opposition to the proposed regulations. He stated, "Nobody approves policies that cause harm, but realism and common sense are needed in the development of public policy." He emphasized that Pennsylvania is still struggling to meet the requirements of the 1990 regulations.

He also brought up the point that the proposed regulations would cost 1.3 billion jobs and the business and industrial community would be required to spend \$62 billion in compliance costs. His most impressive commentary raised the issue of the scientific validity of the data on which the need for the regulations is justified. He emphasized that the EPA's advisory body of technical and medical experts, the Clean Air Scientific Advisory Committee (CASAC), has said lowering the ozone standard from the current level of 120 parts per billion (ppb) to a proposed standard of 80 ppb would produce no health benefit.

Additionally, in an editorial in the September 1996 edition of the *Journal of Air and Waste Management Association*, the Chairman of the CASAC, Dr. George Wolff, said "science has not shown that any of the alternatives (to the current standard) are more protective of public health than any other (standard)."

He emphasized that "six common sense" factors should govern environmental reform:

- They should be **results oriented**.
- **Prior problems** should be addressed.
- Natural resource management should be **site specific**.
- **Private property** should be respected.
- There should be an **environmental/economic impact analysis**.
- **Economic improvement** is vital to improving the environment.

Prior Knowledge

Interestingly, 62% of the Public Opinion Court participants had previously heard of the Clean Air Act. Ninety-two percent were not aware that Congress was in the process of rewriting and updating the Act. Sixty-two percent were not aware that the EPA proposals would create tougher regulations relative to the amount of particulate matter and ozone which would be allowed into the atmosphere from sources such as cars, power plants, etc. Ninety-two percent of the group initially favored tougher clean air standards. However, by the end of the session, only 62% favored tougher standards.

As happened with the focus group of December of 1994, this group of citizens, while obviously being in support of clean

air, began to balk at supporting regulations when they became aware of the costs. Coming into the session, only 23% were aware of the control measures which would be placed on any county that was not in compliance with clean air regulations.

Control Measures

The question: "Which of the following 'control measures' would you consider to be reasonable or unreasonable?" produced these results:

	REASONABLE	UNREASONABLE
Required use of electric-powered vehicles	23% (8%)	77% (92%)
Mandatory car pooling to work	54% (31%)	46% (69%)
Significant gas tax hike (\$.25 to \$.50)	46% (62%)	54% (38%)
Rationed (by allowing their use only every other week/ weekend) use of such personal items as barbecue grills, gas-powered lawnmowers, wood-burning stoves, fireplaces and motor boats	33% (23%)	67% (77%)
Increased property taxes	0% (23%)	100% (77%)

(NOTE: The numbers in parentheses are the exit poll results)

The group expressed mixed feelings on which government agency they trusted the most in protecting the environment. On the question "Do you think the federal government is the best protector of the environment?" the group split 50%-50% on both the entrance and exit surveys. On a scale of one to five, (with five being the highest), the group rated the federal government highest (3.7)

on the entrance survey, but rated local government the highest (3.5) on the exit survey. Having government and industry working together scored significantly high on both the entrance (3.2) and exit (3.1) surveys. The group initially believed that additional government regulations would help to improve air quality in their area by 77-8% in the entrance survey; however, this support declined to only 46-38% in the exit survey.

Science and Jobs

Chris Nicholas of Pennsylvania Citizens for a Sound Economy questioned the validity of the scientific research behind this push for tougher clean air regulations as the heart of the issue. The group appreciated this point as they said they would oppose tougher air quality standards by 69-23% if they were told the Environmental Protection Agency's (EPA) own Clean Air Scientific Advisory Committee felt the proposed new standards were based on faulty scientific research.

The focus group then addressed the provisions of the Clean Air Act, which declares any county that does not meet the EPA's minimum requirements is to be in "non-attainment". This means a set of so-called "control measures" will be invoked in an effort to cut down on pollution and bring the county into attainment. It should also be noted that Lycoming County is currently the only county in Pennsylvania that would be in attainment under the proposed new rules.

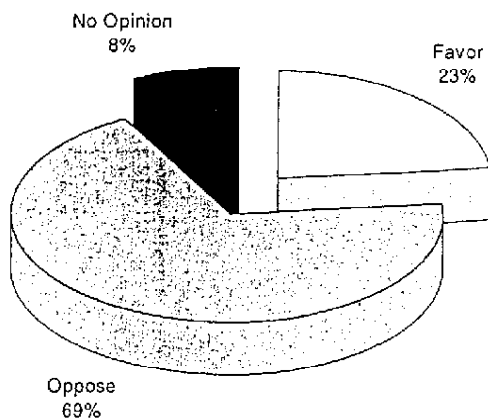
The problem of how much people are willing to pay for cleaner air was examined by the Public Opinion Court. The Court initially favored the concept unanimously of using reformulated gasoline (RFG) to lower auto exhaust emissions and to improve air quality. The implementation of this proposal, however, produced serious reservations.

Only 69% of the group would use RFG, if it were available and would cost on average 15-30 cents more per gallon. The number of members who would use RFG, even if more expensive, dropped to none when told that RFG would be harder on the engine and give fewer miles per gallon.

The focus group participants also realized that these proposed new regulations could potentially affect them personally

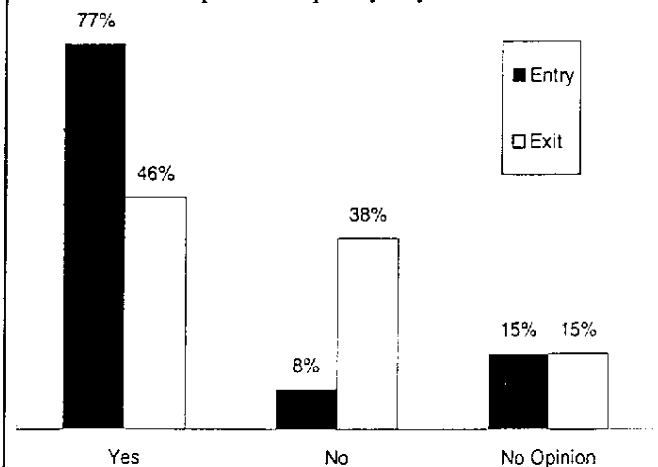
Continued on Page 10

Would you favor tougher air quality standards if you were told the Environmental Protection Agency's (EPA) own Clean Air Scientific Advisory committee felt the proposed new standards were based on faulty scientific research?



Source: Lincoln Institute of Public Opinion Research, Inc.

Do you think additional government regulations will help to improve air quality in your area?



Source: Lincoln Institute of Public Opinion Research, Inc.

through the loss of their own job. Only 23% said they would approve of proposed new government regulations that might help improve air quality, but would cause the loss of jobs in their area. That support declined to only 11% if it would result in the loss of jobs where the Court participant or a member of their immediate family works.

Additional Costs

Regarding the cost to business and industry of complying with the proposed regulations, the Court felt businesses should be required to install anti-pollution equipment by a 92-8% margin.

Interestingly, when asked if they would buy products if there was an increase in the product, the results changed significantly. Sixty-nine percent would still purchase if the increase were only 10%. If the increase were 25%, 77% would not purchase. The number refusing to purchase jumped to 92% when the cost increase was 50%.

Car-pooling

On other issues, the Public Opinion Court unanimously endorsed the concept of car-pooling as an effective way to cut down on auto emissions. The Court had considerable reservations, however, about the methods of implementing a car-pooling policy.

Although the Court unanimously endorsed the proposal that employers "should encourage" car-pooling, the Court also opposed employers "requiring" car-pooling by 69-31%.

Although 54% of the Court supported the idea that the federal government should require car-pooling for employees of large corporations (500 or more employees); only 15% supported "the levying of large fines against major corporations who don't force their employees to car-pool to work."

Perception of Air Quality

The group also did not notice any significant change in the air quality -- 62% in the entrance survey and 69% in the exit survey felt air quality in their county over the past five years was basically the same. Initially the group felt additional government regulations would improve air quality by 77-8%; this support declined to 46-38% in the exit survey.

The Voice of the People

The Public Opinion Court is an extension of the Lincoln Institute's commitment to an extensive public information and educational program designed to encourage federal and state public policy based upon traditional American values. It was co-sponsored by the King of Prussia Chamber of Commerce.

Public Opinion Court focus group sessions are a unique method for gaining more in-depth insight and understanding of public opinion. The process is conducive to the analysis of the intensity of public opinion, as well as recording the change in views as the participants respond to the pros and cons of the presentations.

The Public Opinion Court is a manifestation of "democracy in action". Its grassroots approach gives "We the People" the opportunity to do something to get involved. It gives participants the opportunity

to be involved in a program that has tremendous opportunity to influence public opinion. The members of the Court have enormous responsibility. They represent the people during the session. They are the people.

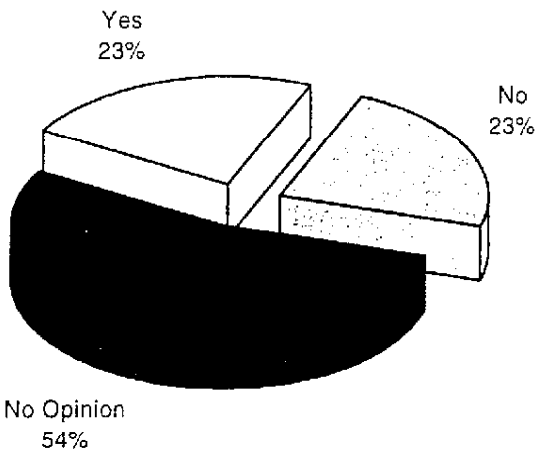


Charles Kennedy



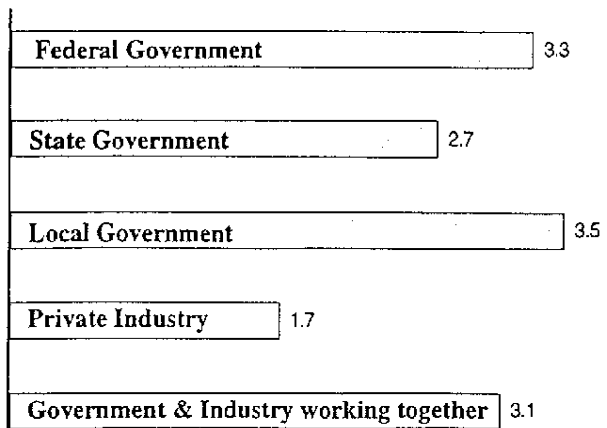
(Charles Kennedy served as moderator of the Public Opinion Court focus group session. He is an instructor of Political Science at Penn State York.)

Do you think the federal government is the best protector of the environment?



Source: Lincoln Institute of Public Opinion Research, Inc.

On a scale of 1 to 5, with 1 being the lowest and 5 being the highest, who do you TRUST to maintain a clean environment?



Source: Lincoln Institute of Public Opinion Research, Inc.

susceptibility to respiratory infection and ecosystem damage. But it is also very possible that EPA overstated its benefit estimate.

Benefit Estimates Include Reduced Mortality

More than 98 percent of the upper-bound benefit estimates for the two alternative standards evaluated result from counting mortality benefits.⁶³ The upper bound estimate for partial attainment is 110 to 250 avoided deaths per year (the low bound and best estimates are for no avoided deaths).⁶⁴

The RIA states:

Although the Agency recognizes that a high degree of uncertainty exists in the estimation of ozone-induced mortality, the evidence linking a causal relationship between ozone exposure and mortality is significant enough in these new studies to warrant inclusion of this category in the analysis.⁶⁵

This statement is inconsistent with the Criteria Document, the Staff Paper, and the extensive literature on ozone's human health effects.

EPA's estimate of mortality due to ozone exposure is based on a 1995 study that shows an association between ozone and mortality during summertime in Philadelphia.⁶⁶ The study does not conclude that ozone causes the mortality. In fact, it clearly states that "in our current state of knowledge, a specific component of air pollution cannot be singled out as being responsible for the association between air pollution and mortality."⁶⁷ EPA has mischaracterized the results of this paper. The inclusion of mortality estimates in the RIA upper bound benefit estimate is not scientifically justified.

Risk Assessments Have Been Revised

Since the RIA was conducted, EPA has revised its risk assessments. To the extent that the public health benefits expected from the proposed NAAQS are lower, the monetized benefit calculation in the RIA should also be lower.

Other Cost-Benefit Estimates

Economist Susan Dudley estimates the costs of full compliance with the current and proposed ozone standards. According to her analysis, reaching the current standard would cost between \$22 billion and \$53 billion per year. Attaining the proposed standard would cost an additional \$54 billion to \$328 billion per year.⁶⁸

These estimates may represent an upper bound, but they are no less plausible than EPA's underestimate.

Dudley also points out that lower tropospheric ozone concentrations may actually create negative health effects. Ozone serves the important function of shielding the earth's surface from harmful UV-B radiation. Reducing tropospheric (ground-level) ozone concentrations will increase human exposure to UV-B radiation. According to Dudley's estimates, "implementation of the proposal will result in between 2,000 and 11,000 new cases of nonmelanoma skin cancer; 130 to 260 new cases of cutaneous melanoma, 25 to 50 melanoma-caused deaths, and 13,000 to 28,000 incidents of cataracts." These effects are estimated at \$333 million to \$1.3 billion, using EPA's values.⁶⁹

Reducing tropospheric (ground-level) ozone concentrations will increase human exposure to UV-B radiation.

The President's Council of Economic Advisers has also taken interest in the costs and benefits of the proposed NAAQS. CEA projects the costs at between \$11.6 billion to \$60 billion and the benefits at \$200 million to \$1 billion.⁷⁰

Yet another study, funded by the American Petroleum Institute, estimates that the costs for the Chicago area alone would be \$2.5 billion to \$7 billion annually, incremental to the current standard.⁷¹ The lower-bound estimate for Chicago alone is equal to EPA's upper-bound estimate for the entire nation. The corresponding health benefits for Chicago are projected to be \$33 million.⁷²

Summary

EPA's Regulatory Impact Analysis estimates that the proposed ozone standard would cost between \$600 million and \$2.5 billion, and provide benefits valued at between \$4 million and \$1.5 billion. These projections are unlikely to be accurate, since the RIA undercounts costs and overstates benefits.

The RIA only counts low-cost, or "conventional," control measures. As a result, the analysis provides a complete cost estimate for only one to three cities in the United States, out of 37 to 75 areas expected to be in violation. In addition, the RIA attributes

no costs to areas with ozone concentrations up to 0.92 ppm (marginal nonattainment areas), which account for 47 to 62 percent of all expected nonattainment areas.⁷³ The RIA also neglects to count administrative costs.

The upper-bound benefit estimate of \$1.5 billion is almost certainly an overstatement, since it is driven mostly by reduced mortality. Furthermore, EPA's revised risk assessments should result in lower benefit estimates.

Other cost-benefit estimates are less favorable than EPA's and indicate that the proposed standard could cost many billions of dollars more than it generates in health benefits.

Economic Analysis of the Proposed PM_{2.5} NAAQS

EPA predicts that the PM_{2.5} standard will result in much higher benefits than the ozone standard. This is mostly due to the large reduction in premature mortality EPA expects from reaching the standard, although, as pointed out in the health effects section of this paper, this health benefit may never materialize. Like the ozone RIA, the particulate RIA almost certainly understates the true costs of attaining the proposed NAAQS and overstates the benefits.

PM_{2.5} RIA Methodology and Results

The methodology used in the Regulatory Impact Analysis for the proposed PM_{2.5} standard is very similar to that used for the ozone RIA. Fortunately, the PM_{2.5} RIA directly analyzes the proposed 15 $\mu\text{g}/\text{m}^3$ (annual mean) and 50 $\mu\text{g}/\text{m}^3$ (24-hour average) standards.

In conducting the particulate matter RIA, agency staff divided the country into seven regions and estimated baseline air quality and average PM_{2.5} concentrations under the proposed standard for each region. The national results are based on the sum of the cost and benefit estimates for the seven regions. Like the ozone Regulatory Impact Analysis, the PM_{2.5} RIA first estimated 2007 air quality based on 1990 emissions and assumptions about population growth and industrial development. EPA also assumed that the 1990 Clean Air Act Amendments (CAAA) and the current standard for PM₁₀ would be fully implemented by 2007.

Next, the agency identified emissions targets and control measures that areas could use to achieve the necessary emissions reductions. Again, EPA included what it considers to be "a reasonable set of control measures." It chose a cutoff cost of \$1

billion per $\mu\text{g}/\text{m}^3$ to define "reasonable."⁷⁴ It then sequentially added an area's control costs until the area could meet its target reductions, or until the set of reasonable control measures had been exhausted.

The agency estimated benefits by first predicting the changes in incidence of health and welfare effects that would result from the changes in air quality expected under the standard. It then applied monetary values to these health effects.

Like the ozone RIA, the particulate RIA only estimates partial attainment costs but estimates benefits for full and partial attainment. The costs and benefits presented are incremental to those required to meet the current standard. The RIA projects partial attainment costs for the proposed PM_{2.5} standards of \$6.3 billion per year (1990 dollars). The analysis estimates partial attainment benefits of \$58 billion to \$119 billion, and full attainment benefits of \$69 billion to \$144 billion.⁷⁵

These cost and benefit projections suggest that the partial attainment benefits would be many times greater than the partial attainment costs. There is reason to be skeptical about this analysis' costs and benefits.

Why the Particulate RIA Understates Costs

The Regulatory Impact Analysis is likely to understate costs because it only considers low-cost control measures. Excluding controls which cost over an arbitrary ceiling of \$1 billion per $\mu\text{g}/\text{m}^3$ allows EPA to present partial attainment costs that appear to be quite modest.

EPA says a \$1 billion per $\mu\text{g}/\text{m}^3$ threshold was set "to eliminate extreme measures that are unrealistically cost-ineffective."⁷⁶ The agency says that "attempts to move beyond the currently projected level of partial attainment would cost significantly more than this." It then confidently asserts that lower-cost control strategies will be identified in the future.⁷⁷

Of the 126 areas projected to violate the proposed standard, 57 would not be able to meet the standard using the measures that cost less than the \$1 billion per $\mu\text{g}/\text{m}^3$ threshold.⁷⁸ EPA calls these areas "residual nonattainment" areas.

None of the seven U.S. regions modeled in the RIA could meet the fine-particulate standards; the reductions achieved ranged from 15 percent to 98 percent of those needed. The average PM_{2.5} abatement across the seven regions was 53 percent of the needed reductions.⁷⁹ The sum of the regional shortfalls is 13.4 $\mu\text{g}/\text{m}^3$, or on average 1.9 $\mu\text{g}/\text{m}^3$ per region.

EPA performed a sensitivity analysis for two cities, Denver and Philadelphia, for the RIA. This calculation demonstrates how quickly marginal cost rises above EPA's \$1 billion per $\mu\text{g}/\text{m}^3$ cutoff. In Philadelphia County, the control measures costing less than this cutoff figure would reduce $\text{PM}_{2.5}$ levels by just 20 percent from the 2007 baseline. An additional 1 percent reduction would result from a \$2 billion per $\mu\text{g}/\text{m}^3$ cutoff, but the cost would double. The RIA reports similar results for Denver.⁸⁰

An EPA contractor found that Philadelphia would face costs of \$4.28 billion per $\mu\text{g}/\text{m}^3$ or more, and still not attain the standard.⁸¹ Based on this figure, Dr. Thomas Hopkins, an adjunct fellow of the Center for the Study of American Business and a professor of economics at Rochester Institute of Technology, estimates that full compliance might necessitate expenditures totaling \$55 billion a year.⁸²

Another troubling aspect of the cost estimate is that EPA only considers the 470 counties nationwide that currently have PM_{10} monitors.⁸³ It is likely that counties outside of this set will be found to violate a $\text{PM}_{2.5}$ standard when more $\text{PM}_{2.5}$ concentration data become available. This would also tend to raise the full costs of attaining the proposed standard.

Why the Particulate RIA Overstates Benefits

The particulate RIA also is likely to overstate benefits for several reasons. Some are related to the uncertainty involved in the science, as discussed previously. Another has to do with the extent of shortened lifespan assumed from fine particulate exposure.

Scientific Uncertainties. The health effects claims about fine particulates are plagued with uncertainties, which necessarily translate into highly uncertain benefit estimates. The RIA assumes that 21,000 lives will be saved each year as a result of lowering fine particulate concentrations.⁸⁴ Using the more recent estimate of 15,000 lives saved a year instead of 21,000 (at a value of \$4.8 million a life) would lower the benefit estimate by \$29 billion. This illustrates the importance of both the high value assigned to prolonged life and of the high mortality estimates in EPA's benefit calculations.

Extent of Life Shortening. As discussed in the particulate health-effects section, the age or health of those presumed to be dying from particulate exposure has not been determined. EPA values each life at \$4.8 million, an average figure it derived from 26 value-of-life studies.⁸⁵ This figure represents an average for an

individual of middle age with half a lifetime remaining and would not be appropriate for valuing populations that are, on average, either older or younger.

The health effects claims about fine particulates are plagued with uncertainties, which necessarily translate into highly uncertain benefit estimates.

If people are dying from particulates, however, they are probably not of average age. Instead, they are most likely elderly individuals who would otherwise die within days or years.⁸⁶ The RIA estimates that about 85 percent of the premature mortality related to particulates occurs in the population over age 65.⁸⁷

Hopkins points out that EPA's \$4.8 million valuation per life leads to a substantial overstatement of benefits. He suggests that EPA adjust its valuation downward to more accurately reflect the actual length of prolongation that might result from lower fine-particulate levels. Hopkins notes that the American Lung Association puts the average life shortening due to fine particulates at two years. He also points to a National Research Council estimate that values mortality due to pollution exposure much differently than the RIA does. It values lives lost as a result of air pollution at \$1.3 million each.⁸⁸

Summary

EPA's Regulatory Impact Analysis projects costs of \$6.3 billion and benefits of \$58 billion to \$119 billion per year from partial attainment of its proposed air quality standard for fine particulates. These cost and benefit estimates are far different than the actual costs and benefits would be.

The low cost estimate results from counting only less expensive control measures and only covers about half of the needed $\text{PM}_{2.5}$ reductions (the less expensive half). Because expenditures on pollution abatement follow the typical pattern of rising marginal costs, we can expect the cost of full attainment to be a substantial multiple of EPA's partial attainment estimate of \$6.3 billion. One rough estimate is a full attainment cost of \$55 billion a year.

The extraordinary benefit estimates are the result of high mortality projections, although these estimates lack strong scientific

support. Hopkins notes, "One rarely encounters public policy options capable of yielding benefits this large. EPA's benefit claims, however, lack a solid foundation."⁸⁹ The uncertainty in the fine-particulate science is exemplified by EPA's reduction of its "lives saved" estimate by 25 percent in April 1997 to correct for a "technical error." EPA has also overvalued the mortality benefits by applying values appropriate for individuals of middle age rather than elderly individuals with preexisting conditions.

Conclusion and Recommendations

The Environmental Protection Agency's simultaneous proposal of ozone and fine particulate National Ambient Air Quality Standards creates the perception that the standards will yield large public-health benefits at relatively modest costs. But upon closer examination, it appears evident that neither of the two standards would be a wise public-health investment.

The ozone standard's inability to pass a cost-benefit test on its own is masked by the high benefits projected for the particulate standard. But the fine-particulate proposal's benefits are based on inadequate science. The extensive scientific literature on ozone and a fair amount on PM₁₀ allows the EPA administrator to say that the standards are based on "hundreds of peer-reviewed studies," even though the PM_{2.5} proposal is only based on a handful.

In truth, the ozone standard would create only small public-health benefits. Recently, the estimates of these benefits have become even smaller as a result of EPA's revisions to its health risk assessments. EPA claims the PM_{2.5} standard would create substantial public health benefits by reducing thousands of cases of premature mortality and morbidity. These claims appear to be much larger than the scientific evidence can support.

So why has EPA proposed air quality standards that are of uncertain benefit for Americans? Quite simply, because the Clean Air Act requires it to do so. The act's goal of protecting public health "with an adequate margin of safety" does not distinguish between cost-effective and cost-ineffective air quality standards, as long as they result in some amount of health benefit.

Members of the Clean Air Scientific Advisory Committee (CASAC) recognized the flaw in the act's goal. After explaining that health effects from ozone cannot be entirely eliminated, they wrote that "the paradigm of selecting a standard at the lowest-observable-effects level and then providing an 'adequate margin of safety' is no longer possible."⁹⁰

In other words, the Clean Air Act's goal cannot literally be achieved, at least for ozone. EPA can attempt to prevent all health effects caused by air pollution, but doing so will divert large amounts of resources from the pursuit of other important social objectives.

*The Clean Air Act's goal cannot literally be achieved,
at least for ozone.*

As for fine particulates, the CASAC closure letter endorsed a PM_{2.5} standard in principle, but cautioned that, "there was no consensus on the level, averaging times, or form." CASAC also called attention to "the many unanswered questions and uncertainties regarding the issue of causality."⁹¹ The panel also noted that the court-ordered NAAQS review process simply did not allow enough time to properly study PM_{2.5} health effects:

[T]he deadlines did not allow adequate time to analyze, integrate, interpret, and debate the available data on this very complex issue. Nor does a court-ordered schedule recognize that achieving the goal of a scientifically defensible NAAQS for PM may require iterative steps to be taken in which new data are acquired to fill obvious and critical voids in our knowledge.⁹²

Caution is needed in the case of a new fine-particulate standard; aiming the country's pollution-abatement efforts at the wrong agent would be a costly mistake.

So how should air quality standards be set? First, Congress should change the Clean Air Act's basic objective from "protecting the public health with an adequate margin of safety" to "protecting public health against *unreasonable* risk of *important* health effects."

Second, Congress should require that air quality standards pass a cost-benefit analysis. Americans expect their elected officials to protect them from air pollution that might significantly harm their health. They do not expect, however, that the costs of this protection will be grossly disproportionate to the benefits.

The EPA Administrator must announce her decision on the particulate matter standard by July 19, although she is not required to do so for ozone. What should she do?

In the case of particulate matter, EPA should affirm the current PM₁₀ standard and wait for the science to "catch up" before

establishing a PM_{2.5} standard. In the case of ozone, "staying the course" — leaving the standard unchanged — would be prudent.

Complying with the letter of the law could necessitate setting a standard even tighter than the one proposed. A strict interpretation of the Clean Air Act leaves little justification for a standard above background levels. EPA could very well be sued for setting a standard at which some individuals experience health effects, even though such pristine air would be prohibitively costly to achieve. If the Act is not changed, the proposed ozone standard is likely to be but a way station along the road to an unachievable standard.

Air quality has improved remarkably over the last quarter-century. From 1970 to 1994, VOC emissions declined 24 percent, and between 1985 and 1994, ozone concentrations fell 12 percent. Likewise, PM₁₀ emissions decreased 78 percent from 1970 to 1994, and total suspended particulate concentrations fell 20 percent between 1988 and 1994.⁹³ Air quality will continue to improve as U.S. cities make progress toward current ozone and particulate standards. Changing the definition of healthful air with regard to ozone and particulates will disrupt this current progress in exchange for dubious future benefits.

Administrator Browner should not propose new ozone and fine particulate standards in July. Instead, she should appeal to Congress to change the act's goal and to allow cost-benefit analysis in standard setting.

These simple yet revolutionary changes would go a long way to add more value for each dollar spent for cleaner air. They would also allow resources to be targeted toward the most pressing public health issues, rather than toward lesser, high-cost, low-benefit priorities. Americans deserve protection from harm caused by air pollution. They also deserve rational air quality standards based on sound science. To achieve both of these important objectives requires fundamental reform of the Clean Air Act.

Notes

1. *Socio-Economic Study of Possible Eight-Hour Ozone Standard* (Sacramento, Calif.: Sierra Research, Inc., prepared for American Petroleum Institute, June 4, 1996).
2. U.S. EPA, *Draft Document Regulatory Impact Analysis for Proposed Particulate Matter National Ambient Air Quality Standard* (Research Triangle Park, North Carolina: EPA Innovative Strategies and Economics Group, Office of Air Quality Planning and Standards, December 1996), Tables 9.6, 9.8. [Hereafter, *PM RIA*.]
3. U.S. EPA, *Health and Environmental Effects of Particulate Matter*, Fact Sheet, April 3, 1997.
4. Testimony of EPA Administrator Carol Browner before U.S. Senate Committee on Environment and Public Works, February 12, 1997.
5. *ibid.*
6. U.S. EPA, *Air Quality Criteria for Particulate Matter* [hereafter, "*PM Criteria Document*"] (EPA/600/P-95-001-aF through EPA/600/P-95-001-cF, April 1996); U.S. EPA, *Air Quality Criteria for O₃ and Other Photo-chemical Oxidants* [hereafter, "*Ozone Criteria Document*"] (EPA/600/P-93-004aF through EPA/600/P-93-004cF, July 1996); U.S. EPA, *Review of the National Ambient Air Quality Standards for Particulate Matter: Policy Assessment of Scientific and Technical Information* [hereafter, "*PM Staff Paper*"] (EPA-452/R-96-013, July 1996); U.S. EPA, *Review of the National Ambient Air Quality Standards for O₃: Assessment of Scientific and Technical Information* [hereafter, "*Ozone Staff Paper*"] (EPA-452/R-96-007, June 1996).
7. Clean Air Scientific Advisory Committee (CASAC) closure letter to EPA Administrator Carol Browner on the primary standard portion of the OAQPS Staff Paper for Ozone, November 31, 1995, p. 2.
8. U.S. EPA, *Ozone Staff Paper*, pp. 20, 21.
9. *Ibid.*, figure V-1.
10. Donald H. Horstman, Lawrence J. Folinsbec, Phillip J. Ives, Said Abdul-Salaam, William F. McDonnell, "Ozone Concentration and Pulmonary Response Relationships for 6.6-Hour Exposures with Five Hours of Moderate Exercise to 0.08, 0.10, and 0.12 ppm," *American Review of Respiratory Disease*, v. 142, n. 5, November 1990, pp. 1158-63.
11. William F. McDonnell, Howard R. Kehrl, Said Abdul-Salaam,

- Philip J. Ives, Lawrence J. Folinsbee, Robert B. Devlin, John J. O'Neil, and Donald H. Horstman, "Respiratory Response of Humans Exposed to Low Levels of Ozone for 6.6 Hours," *Archives of Environmental Health*, v. 46, n. 3, May/June 1991, pp. 145-150; Lawrence J. Folinsbee, Donald H. Horstman, Howard R. Kehrl, Shirley Harder, Said Abdul-Salaam, and Philip J. Ives, "Respiratory Responses to Repeated Prolonged Exposure to 0.12 ppm Ozone," *American Journal of Respiratory and Critical Care Medicine*, v. 149, 1994, pp. 98-105.
12. U.S. EPA, *Ozone Staff Paper*, p. 55.
 13. George D. Thurston, Kazuhiko Ito, Patrick L. Kinney, and Morton Lippmann, "A Multi-Year Study of Air Pollution and Respiratory Hospital Admissions in Three New York State Metropolitan Areas: Results for 1988 and 1989 Summers," *Journal of Exposure Analysis and Environmental Epidemiology*, v. 2, n. 4, 1992, pp. 429-450.
 14. R.G. Whitfield, *A Probabilistic Assessment of Health Risks Associated with Short-term Exposure to Tropospheric Ozone: A Supplement* (produced by Argonne National Laboratory, Argonne, Illinois, for U.S. Environmental Protection Agency, January 1997), Table 6.
 15. U.S. EPA, *Ozone Staff Paper*, pp. 36-38.
 16. *Ibid.*, p. 36.
 17. *Ibid.*, pp. 37-38.
 18. U.S. EPA, *Fact Sheet: Health and Environmental Effects of Ground-Level Ozone*, November 29, 1996.
 19. U.S. EPA, *Ozone Staff Paper*, p. 61.
 20. *Ibid.*
 21. *Ibid.*, p. 49.
 22. For example, one study found that "Animals exposed for 20 months to 0.5 or 1.0 ppm ozone demonstrated dramatic increases in the volume of interstitium and epithelium along the alveolar ducts." Ling-Yi Chang, Barbara L. Stockstill, Margaret G. Menache, Robert R. Mercer, James D. Crapo, *Consequences of Prolonged Inhalation of Ozone on F344/N Rats: Collaborative Studies. Part VIII: Morphometric Analysis of Structural Alterations in Alveolar Regions*, Health Effects Institute, Research Report No. 65, March 1995, pp. 3-39.
 23. U.S. EPA, *Ozone Staff Paper*, p. 51.
 24. *Ibid.*
 25. Testimony of EPA Administrator Carol Browner before the U.S. Senate Committee on Environment and Public Works, February 12, 1997.
 26. U.S. EPA, Health and Environmental Effects of Particulate Matter, Fact Sheet, April 3, 1997.
 27. U.S. EPA, Health and Environmental Effects of Particulate Matter, Fact Sheet, November 29, 1996.
 28. U.S. EPA, Health and Environmental Effects of Particulate Matter, Fact Sheet, April 3, 1997.
 29. Douglas Dockery, C. Arden Pope III, Xiping Xu, John D. Spengler, James H. Ware, Martha E. Fay, Benjamin G. Ferris, Jr., Frank E. Speizer, "An Association Between Air Pollution and Mortality in Six Cities," *New England Journal of Medicine*, v. 329, n. 24, December 9, 1993, pp. 1753-1759.
 30. Gary Taubes, "Epidemiology Faces Its Limits," *Science*, v. 269, July 14, 1995, pp. 164-169.
 31. C. Arden Pope III, Michael J. Thun, Mohan M. Namboodiri, Douglas W. Dockery, John S. Evans, Frank E. Speizer, Clark W. Heath, Jr., "Particulate Air Pollution as a Predictor of Mortality in a Prospective Study of U.S. Adults," *American Journal of Respiratory and Critical Care Medicine*, v. 151, 1995, pp. 669-674.
 32. Taubes, pp. 164-169.
 33. U.S. EPA, *PM Staff Paper*, p. VII-43.
 34. *Ibid.*, p. VII-42.
 35. Statistical significance implies a good chance that the detected relationship actually exists, in this case 95 percent.
 36. Death codes 401 to 440 according to the International Classification of Diseases, 9th revision.
 37. William Landau, Gregory Evans, Raymond Slavin, written comment to EPA on proposed National Ambient Air Quality Standard for PM_{2.5}, March 7, 1997.
 38. U.S. EPA, *PM Staff Paper*, p. VII-44.
 39. Bob Herbert, "Bad Air Day," *New York Times*, February 10, 1997, p. A15.
 40. Suresh H. Moolgavkar and E. Georg Luebeck, "A Critical Review of the Evidence on Particulate Air Pollution and Mortality," *Epidemiology*, v. 7, n. 4, July 1996, pp. 420-428.
 41. U.S. EPA, *PM Staff Paper*, p. VII-43.
 42. Testimony of Thomas B. Starr before the United States Senate Subcommittee on Clean Air, Wetlands, Private Property and

- Nuclear Safety, Committee on Environment and Public Works, April 24, 1997.
43. Testimony of EPA Administrator Carol Browner before U.S. Senate Committee on Environment and Public Works, February 12, 1997.
 44. U.S. EPA, *National Air Quality and Emissions Trends Report, 1995* (Research Triangle Park, N.C.: EPA Office of Air Quality Planning and Standards, October 1996), p. 163.
 45. U.S. EPA, *Health and Environmental Effects of Particulate Matter*, Fact Sheet, November 29, 1996.
 46. Testimony of EPA Administrator Carol Browner before U.S. Senate Committee on Environment and Public Works, February 12, 1997.
 47. CASAC closure letter to EPA Administrator Carol M. Browner on the Staff Paper for Particulate Matter, June 13, 1996.
 48. Testimony of EPA Administrator Carol Browner before U.S. Senate Committee on Environment and Public Works, February 12, 1997.
 49. U.S. EPA, *Regulatory Impact Analysis for Proposed Ozone National Ambient Air Quality Standard* (Research Triangle Park, North Carolina: EPA Innovative Strategies and Economics Group, Office of Air Quality Planning and Standards, December 1996), p. ES-1. [Hereafter, *Ozone RIA*.]
 50. Both proposals would set an eight-hour standard at 0.08 ppm, but one would measure the second-highest average daily maximum [8H1AX-80] and the other the fifth highest [8H4AX-80].
 51. U.S. EPA, *Ozone RIA*, p. V-8.
 52. *Ibid.*, section V.
 53. U.S. EPA, *EPA's Regulatory Impact Analysis for the Ozone Standard*, Fact Sheet, November 29, 1997.
 54. U.S. EPA, *Ozone RIA*, p. VI-9.
 55. U.S. EPA, *Ozone Carbon Monoxide Particulate Matter Sulfur Dioxide Lead Areas Designated Nonattainment* ("Green Book"), (Research Triangle Park, N. C.: EPA Office of Air Quality Planning and Standards, July 4, 1996).
 56. U.S. EPA, "AQS Data—USA Max Value Report—O₃," Aerometric Information Retrieval System (AIRS), Air Quality Subsystem (AQS), Sample of AQS Monitor Data, Ozone (O₃), located on the World Wide Web at <http://www.epa.gov/airs/aqsd-o3.html>, accessed on April 25, 1997.
 57. U.S. EPA, "List of Counties for Ozone," located on the World Wide Web at <http://ttnwww.rtpnc.epa.gov/naaqspro/o3list.htm>, accessed February 26, 1997.
 58. Obtained through personal communication with Mitchell Baer, a Senior Regulatory Analyst at API.
 59. U.S. EPA, *Ozone RIA*, pp. I-12.
 60. *Ibid.*, section VI-B(1).
 61. *Ibid.*, pp. I-5.
 62. *Ibid.*, p. V-3.
 63. *Ibid.*, pp. IX-22, IX-23.
 64. *Ibid.*, Tables E-11, E-12, E-13.
 65. *Ibid.*, pp. I-13.
 66. *Ibid.*, p. IX-7.
 67. Suresh H. Moolgavkar, E. Georg Luebeck, Thomas A. Hall, Elizabeth L. Anderson, "Air Pollution and Daily Mortality in Philadelphia," *Epidemiology*, v. 6, n. 5, September 1995, pp. 476-484.
 68. Susan E. Dudley, *Comments on the U.S. Environmental Protection Agency's Proposed National Ambient Air Quality Standard for Ozone* (prepared for The Regulatory Analysis Program, Center for Study of Public Choice, George Mason University, March 12, 1997), Appendix C.
 69. *Ibid.*, Appendix B.
 70. Memorandum from Alicia Munnell, Council of Economic Advisers, to Art Frass, Office of Management and Budget, December 13, 1996.
 71. *Socio-Economic Study of Possible Eight-Hour Ozone Standard* (Sacramento: Sierra Research, Inc., prepared for American Petroleum Institute, June 4, 1996), p. ES-16. This study provides cost estimates for the entire Lower Lake Michigan Region. Costs for the Chicago area are about half these costs.
 72. Prasad Rao and Thomas J. Lareau, *The Monetary Health Benefits of an 8-Hour 0.08 ppm Ozone Standard in Chicago* (prepared by American Petroleum Institute, July 1996), p. v.
 73. As discussed previously, 23 of the 37 nonattainment areas under the 8H4AX-80 scenario, and 35 of 75 under the 8H1AX-80 scenario, are projected to be marginal.
 74. *Draft Document Regulatory Impact Analysis for Proposed Particulate Matter National Ambient Air Quality Standard* (Research Triangle Park, N.C.: U.S. EPA Office of Air Quality Planning and

- Standards, December 1996), p. ES-15.
75. U.S. EPA, *PM RIA*, p. ES-24.
 76. *Ibid.*, p. 7-6.
 77. *Ibid.*, p. 7-14.
 78. *Ibid.*, p. 7-8.
 79. Calculation based on Table 7-4 in *PM RIA*.
 80. U. S. EPA, *PM RIA*, p. 7-6.
 81. Pechan & Associates, letter to EPA in EPA Docket A-95-54, November 22, 1996, cited in Thomas D. Hopkins, *Can New Air Standards for Fine Particles Live Up to EPA Hopes?* (St. Louis, Mo.: Center for the Study of American Business, Policy Brief 180, April 1997), p. 16.
 82. *Ibid.*, p. 16.
 83. U.S. EPA, *PM RIA*, p. ES-11.
 84. *Ibid.*, Table 9.8.
 85. *Ibid.*, Table 9.6.
 86. Robert W. Crandall, Frederick H. Reuter, Wilbur A. Steger, "Clearing the Air: EPA's Self-Assessment of Clean-Air Policy," *Regulation*, n. 4 (1996), p. 44.
 87. U.S. EPA, *PM RIA*, p. 9-27.
 88. Hopkins, pp. 6-7, cites the American Lung Association estimate as: Bob Herbert, "Bad Air Day," *New York Times*, February 10, 1997, p. A15. He cites the NRC figure as: National Research Council, *Paying Our Way: Estimating Marginal Social Costs of Freight Transportation*, TRB Special Report 246 (Washington, D.C.: National Academy Press, 1996), p. 159.
 89. Hopkins, p. 6.
 90. CASAC closure letter to EPA Administrator Carol Browner on the primary standard portion of the OAQPS Staff Paper for Ozone (November 31, 1995), p. 2.
 91. CASAC closure letter to EPA Administrator Carol Browner on the Staff Paper for particulate matter, June 13, 1996.
 92. *Ibid.*
 93. U.S. EPA, National Air Quality and Emissions Trends Report, 1994 (Research Triangle Park, N. C.: EPA Office of Air Quality Planning and Standards, October 1995), pp. I-2 - I-3.