

STATE OF CALIFORNIA

PETE WILSON, Governor

AIR RESOURCES BOARD

1102 G STREET
P.O. BOX 2815
SACRAMENTO, CA 95812

April 14, 1991

Senator Rodney Ellis
The Senate of the State of Texas
P.O. Box 12068
Austin, Texas 78711

Dear Senator Ellis:

Thank you for your April 12 letter regarding Senate Bill 868. My response to your questions is provided below.

QUESTION 1: The automobile manufacturers have disseminated information on this bill that estimates the cost of reducing pollution with the low emission vehicle (LEV) standards to be \$34,000 per ton of emissions reduced. Do you agree with this figure?

RESPONSE 1: No. Our estimate of cost effectiveness, which was published last August and approved by our Board following a public hearing, is \$800 to \$1,400 per ton of smog-forming emissions reduced. This cost is very favorable compared to the cost of imposing new emission controls on many industrial sources of pollution. (See the Attachment for additional information).

QUESTION 2: Does CARB believe that the LEV standards can be met using reformulated gasoline?

RESPONSE 2: Yes. Our technology assessments indicate that the LEV standards can be met by gasoline vehicles using improved emission controls. We have built two cars that have achieved hydrocarbon emissions more than 85% below the standards imposed by the recently amended federal Clean Air Act. Oxides of nitrogen emissions are 50% lower too. These vehicles would meet the most stringent of the LEV standards. The first of these vehicles is now being used by our employees in a car pool. The car uses conventional gasoline; we expect the use of reformulated gasoline will lower its emissions even further. (See the Attachment for additional information)

QUESTION 3: Will the State of Texas achieve similar emissions benefits if LEV vehicles are operated on federal, rather than California, reformulated gasoline?

RESPONSE 3: Yes. A vehicle designed to meet the most stringent of the LEV standards would have 75-80% lower hydrocarbon emissions if operated on federal gasoline, compared to 85% lower emissions if operated on California gasoline. The difference is small because improved emission

controls, not reformulated gasoline, will provide most of the emission reductions needed to comply with the LEV standards. Furthermore, the difference in cleanliness between federal and California reformulated gasoline is relatively small (federal gasoline is expected to be 16% cleaner than current gasoline, while California gasoline is expected to be 20-26% cleaner). The real benefit of reformulated gasoline is to reduce emissions from those vehicles that are already on the road that cannot be retrofitted with advanced emission controls.

QUESTION 4: The vehicle manufacturers have testified that consumers will pay about \$500 more for the gasoline powered LEVs. What does CARB predict to be the cost differential between LEVs and the Federal Tier I vehicles?

RESPONSE 4: \$176. This is the average increase in the retail sticker price of a LEV or ULEV fueled with gasoline. Price increases for individual models will vary. The method and information used to estimate these costs is described in the CARB regulatory report, and was approved by our Board following a public hearing.

QUESTION 5: Based on your years of working with the automobile manufacturers on automobile emission control, do you believe the manufacturers have historically underestimated, correctly estimated, or overestimated the costs of complying with new vehicle emission standards?

RESPONSE 5: Overestimated the costs. If the manufacturers' estimated cost of complying with the each of the many emission regulations adopted over the past years was added up, the cost of a new car would be thousands of dollars higher than it actually is today. I believe one reason the manufacturers tend to overestimate costs is most vehicle regulations are technology forcing, and bring with them some uncertainty in how compliance is to be achieved. Given this uncertainty, and the fact that vehicle manufacturers generally have not supported adoption of more stringent emission standards, it is understandable that their cost estimates will be high. Our experience is that the uncertainties of compliance are overcome with good engineering, and that new emission control requirements are soon integrated into the overall design of the engine and vehicle. The result is the true cost of compliance is lower than the estimates offered by the manufacturers at the time the new emission requirements are being debated.

QUESTION 6: EPA testified that Texas can expect to receive significant State Implementation Plan (SIP) credits for adopting LEV standards. In contrast, automobile manufacturers have said Texas would receive only

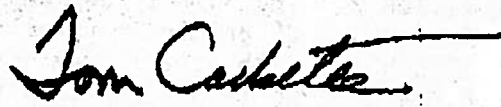
marginal SIP credit for the LEV standards. Does California anticipate receiving significant SIP credits, as suggested by EPA, or marginal SIP credits, as suggested by representatives of the automobile industry?

RESPONSE 6: We expect to receive substantial SIP credits. Adoption of the LEV standards is the cornerstone of our efforts to attain the federal clean air standards. We adopted the LEV standards because they will provide large emission reductions, and they are cost effective. In addition, we would tend to believe the EPA since they, not the vehicle manufacturers, are responsible under federal law for determining SIP credits.

I also understand there has been some confusion regarding the status of the LEV regulations. The CARB unanimously adopted the LEV standards and regulations in September, 1990. Several changes to the regulations made during the hearing have recently been finalized. The steps remaining include approval by the Office of Administrative Law and filing of the regulations by the Secretary of State. These remaining steps are largely ministerial.

I hope you will find these answers helpful, and please feel free to call me at 916-322-2892 if I can be of further assistance.

Sincerely,



Tom Cackette
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Attachment

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Elaboration on Response to Questions 1 and 2

Question 1: Cost effectiveness is calculated by dividing the cost of compliance by the tons of emissions reduced. Some of the differences between the cost effectiveness values calculated by the manufacturers (\$34,000/ton) and CARB (\$900 - \$1,400/ton) are: 1) Manufacturers estimate the cost of compliance to be over 2.5 times higher than CARB; 2) Manufacturers count only the reduction in hydrocarbon (HC) emissions as a benefit. The LEV regulations also reduce smog-forming oxides of nitrogen (NOx) emissions, and will provide a major reduction in cancer-causing benzene emissions (of which 90% comes from cars). CARB includes the benefits of reducing HC, NOx and toxic emissions in its calculations because the LEV standards reduce all three pollutants. 3) Manufacturers are more pessimistic about the durability of the emission control systems in customer use, and thus predict less emission reductions will be achieved, than does CARB; and 4) manufacturers claim emission benefits only for those cars that operate in smoggy areas, while the costs are assessed on a statewide basis. While this methodology may be appropriate for smog-forming emissions, the benefit of reducing cancer-causing emissions such as benzene should be considered in the calculations on a statewide basis since these compounds are present in the air wherever vehicles operate, and there is no safe level to breathe.

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JAMES W. KINNEAR

Clean Air at a Reasonable Price

In 1990, Congress passed extensive and comprehensive amendments to the Clean Air Act of 1970. These amendments, the result of months of negotiation and compromise, address a wide array of air quality issues, including emissions from power plants and factories, as well as from automobiles.

The goal of reducing air pollution is an important one, which my company and responsible business leaders support. But there are many ways of doing this, and some cost far less than others. In terms of cost-effectiveness, the legislation aimed at reducing tailpipe emissions from cars and trucks is deeply flawed.

Regrettably, Congress, under heavy pressure from a variety of groups, adopted the most costly means to achieve improved air quality: changes in how gasoline is made. Congress acted without first determining how expensive reformulated fuels would be, how much they would reduce emissions, or how cost-effective they would be compared to other possible measures. Congress even refused to wait a few months for the results of a comprehensive joint auto-oil in-

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dustry study that would have provided a solid data base for analyzing these issues.

Now, much of those data have become available. And they show that the reformulated fuel mandates—if fully implemented—would be a costly mistake. Requiring the new fuels could raise the pretax wholesale cost of gasoline by 25 percent or more, a price that ultimately would be paid by motorists. Environmentalists don't worry about this because they want higher prices as a way to stimulate conservation. But the U.S. public has made it clear that they do not want higher fuel prices.

Congress undoubtedly was motivated by the fact that it is a lot easier politically to impose clean air costs on the public a nickel at a time—slowly ratcheting up gas-

oline prices—than it is to add a few hundred dollars to the cost of a new car by installing antipollution equipment that industry research indicates would do the job more effectively. But paying for higher-priced, reformulated gasoline a few gallons at a time is going to cost motorists a lot more over the life of the car, in added fuel costs, than would additional antipollution hardware on that car.

Fortunately, there is still a chance to minimize the cost of the Clean Air Act amendments to the motorist, and maximize the environmental benefits, as the legislation is implemented at the federal and state levels. But a midcourse correction in the legislation may well be needed, before the United States commits to the extreme control measures that Congress has mandated for the end of this decade and beyond.

To rectify the situation, we first need to recognize a basic fact: The United States is much closer to solving air pollution problems caused by cars and light trucks than is commonly understood. Tailpipe emissions on new cars have been reduced by nearly 97 percent over the past 20 years. The remaining 3 percent is expected to be cut in half by 1995, through installation of improved pollution-control equipment.

James W. Kinnear is president and chief executive officer of Texaco, Inc.

Indeed, a steadily decreasing amount of the hydrocarbons that contribute to air pollution and ozone smog are gasoline engine-related. By 1995, only 25 percent of total hydrocarbons in the air in the *average* U.S. city will come from gasoline-fueled vehicles. About 60 percent of this 25 percent is caused by gasoline evaporation, leaving only 10 percent of hydrocarbon emissions emitted as tailpipe exhaust. And more than half of that 10 percent comes from heavy trucks and off-road equipment such as bulldozers. In short, car and light truck tailpipe emissions will account for only 4 to 5 percent of total hydrocarbons in the air by 1995. Yet that 4 to 5 percent is the major target of the costly Clean Air Act amendments.

Watch the last step

In the new legislation, Congress, as part of a two-step plan, specified a moderately reformulated fuel for nine metropolitan areas (including Los Angeles, New York, Houston, and Chicago) that have high or relatively high ozone levels. For the first phase, starting in 1995, all gasoline sold in those nine areas must incorporate a formula specified by the federal government. The revamped formula was worked out in recent regulatory negotiations among government, industry, and environmental groups. It is a reasonable solution, since it takes full advantage of the least costly method of reducing hydrocarbon emissions—lowering the vapor pressure of gasoline, which basically reduces fumes that otherwise would evaporate.

The adoption of this moderate formula is expected to reduce car

and light truck emissions by 15 percent from 1990 levels. This reduction would add an estimated 5 to 7 cents to the manufacturing cost of a gallon of gasoline. That's far from ideal. But it is reasonably cost-effective for areas with severe problems.

Unfortunately, however, further congressional mandates leave the realm of cost-effectiveness and common sense. That is because the legislation requires that, starting in the year 2000, total vehicle emissions be reduced by an additional 10 percent from the 1990 base, through more extreme gasoline reformulations.

The year 2000 formula will require a radical change in how gasoline is manufactured—so radical in fact that we're not even sure that it can be made. By contrast, the 1995 fuels will be relatively simple to make, essentially by reducing the amount of butane in gasoline and adding oxygenates, which help reduce wintertime carbon monoxide that contributes to air pollution. But the year 2000 fuels will involve changing the levels of most of the major chemical components of gasoline, which will require the installation of expensive new equipment at refineries. Industry research indicates that the severely reformulated fuels will cost significantly more—15 to 20 cents a gallon—than the 1995 fuels. That's a big price for such a slight improvement in air quality.

Currently, states face an important decision on how they will implement the 1995 regulations. The nine areas deemed severely affected by air pollution will be required to use the new federally mandated fuels, but the Clean Air

legislation gives states three choices for compliance.

First, a state could opt out of the U.S. program, except in the nine metropolitan areas. That, in our opinion at Texaco, is the most sensible, most cost-effective way to go. Second, a state could require that the moderately reformulated fuel be sold in the entire state, thus imposing higher costs on areas that don't need it, with little benefit. It also would be wasteful, since reformulated fuels yield less mileage, according to the joint auto-oil industry study. Third, and worst of all, a state could adopt drastic requirements recently mandated in California. Those rules will require the statewide sale, by March of 1996, of a gasoline that is even more severely reformulated than the federally mandated fuels for 1995.

The California requirements are designed to meet that state's unique smog problem and should not serve as a model for the nation. The Los Angeles area has 140 days a year of unacceptably high ozone levels; New York City, only 20 such days, and the pollution is much less severe. California is also dependent on the automobile for transportation, whereas many other cities rely heavily on bus, subway, and rail transit.

But the proposed California fuels will not be cost-effective in California, much less elsewhere. They will provide little benefit beyond what the moderate federal formula fuel provides, reducing total hydrocarbons in the air by no more than 1 percent. In addition, like the new federal fuels proposed for the year 2000, the California formulas will increase the cost of

making a gallon of gasoline by 15 to 20 cents a gallon.

The California rules will affect both the motorist's wallet and the state's economy, since businesses would be at a competitive disadvantage with companies in states that do not have such onerous fuel costs. Were California to opt for the less expensive federal formula fuel, it could obtain three-quarters of the benefit for just one-quarter of the cost.

Look before you legislate

If severely reformulated gasolines are questionable in California, it would be ludicrous to try to apply them to many other states, where pollution problems are less severe and the climate is different. Yet that is exactly what may happen in many parts of the nation. Already, 11 eastern states and Washington, D.C., have agreed to adopt California's overall program for reducing ozone smog, which relies on changes to the vehicle rather than to the fuel. If these states go further, and agree to adopt California's fuel formula, they will be making a hasty, ill-informed decision. Connecticut, by contrast, is considering the more cost-effective solution of enhanced inspection and maintenance as the cornerstone of its program.

With public dollars in such short supply today, and the needs so great, national decisions must be grounded in a realistic assessment of our capabilities—recognizing that, although U.S. resources are considerable, they nevertheless are finite. Thus, the concept of cost-benefit relationships must be introduced at all levels of decision-making.

Government should provide incentives for the quicker retirement of older cars.

As is the case with so many contemporary issues, there is no quick-and-easy solution to air pollution. But there are solutions. To find them, we need a long-term, comprehensive effort, based on good science and cost-effectiveness, not on politics, emotion, or wishful thinking.

Texaco and others in the oil industry are working to clarify and expand the options. We are willing to do our share to reduce pollution—as long as it is done cost-effectively. Two years ago, Texaco initiated the most extensive research program in history on air pollution, the gasoline engine, and fuels. Thirteen other major oil companies and the big-three U.S. automakers joined our effort to find cost-effective ways of further cutting vehicle emissions.

Thus far, one of the research group's most important conclusions is this: Capturing fumes that normally evaporate is much more cost-effective in cutting hydrocarbon emissions than drastically reformulated gasolines.

Fumes can be captured in three basic ways. One would be to install on all cars a device called an on-board vapor recovery canister, which sucks fumes into the engine

and burns them as fuel. Cars already have a small canister to capture the fumes that evaporate while a car is parked, but it is too small to handle the volume of vapor created in refueling. According to an Office of Technology Assessment study, an additional canister would prevent a ton of hydrocarbons from entering the atmosphere, at a cost of \$1,200 per ton.

Installing special nozzles on gasoline pumps also can do the trick. The nozzles capture the gases and recirculate them through an underground tank. Cost: \$2,400 per ton of hydrocarbons prevented from entering the atmosphere, according to an oil industry study.

The third way to reduce fumes is by lowering fuel vapor pressure, which can be done simply by reducing the amount of butane in gasoline. This would cost \$3,500 per ton of hydrocarbons, according to an oil industry study.

The oil industry favors installing the canisters because the cost is less and because research indicates that a much higher percentage of fumes are captured by the on-board canisters than by nozzles.

What's most important to understand, however, is that all of these methods would be more cost-effective than either the moderate or drastic gasoline reformulation. The moderately reformulated federal fuel, which would require reducing butane but also adding oxygenates, would cut hydrocarbon emissions at a cost of \$10,000 a ton. But the whopper cost would come from the proposed drastic reformulation, similar to the new California formula. Texaco estimates its cost at \$200,000 a ton and possibly much more.

This sky-high \$200,000 figure may seem unbelievable, but it results, as I stated before, from the need to install expensive new equipment at refineries. And although this can be only a rough estimate, there is no doubt that drastic reformulation will be much less cost-effective than the alternatives.

Before we make such a huge mistake, we should consider more commonsense measures—things we can do right now—to protect the environment, while ensuring that the American motorist has adequate supplies of affordable energy.

First, provide incentives for the quicker retirement of older cars. Cars built before 1975 account for just 7 percent of all the miles driven in this country but produce 25 percent of automobile emissions. It would be far more cost-effective to get them off the road than to spend billions on unnecessary, severely reformulated fuels. This could be

done through tax incentives or government-funded repurchase programs.

Second, fully enforce inspection and maintenance laws. Most states do not have effective programs, and local officials shy away from them because they hit the motorist directly in the pocket-book. Although not a single state has fully implemented the U.S. Environmental Protection Agency's enhanced inspection and maintenance program, there is now an incentive to do so. Under the Clean Air Act amendments, states must reduce hydrocarbon emissions from all sources by at least 24 percent from 1990 levels by 1999. The EPA estimates that about 40 percent of this reduction could be achieved from fully implementing its inspection program.

Third, stop subsidizing older cars. Most taxes and fees on cars in the United States decline as a car

gets older. That encourages people to keep their old clunkers. By contrast, in Japan, for instance, taxes and fees remain high as a car ages. This, along with a tough inspection and maintenance program, gives the Japanese motorist an incentive to turn in the old car for a newer one. Because such a change could place an unfair burden on the less affluent, tax credits or other help could be targeted to lower-income motorists. The cost to society would be far less than imposing unnecessary gasoline reformulation on millions who don't need it.

The point is that there are things we can do—sensible, cost-effective things—to clean up the atmosphere without breaking the bank. We at Texaco believe that the public will benefit most if we first exhaust all the lower-cost options. There is no need to waste billions of dollars when other, less costly solutions are at hand.

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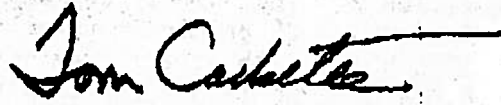
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Indeed, a steadily decreasing amount of the hydrocarbons that contribute to air pollution and ozone smog are gasoline engine-related. By 1995, only 25 percent of total hydrocarbons in the air in the *average* U.S. city will come from gasoline-fueled vehicles. About 60 percent of this 25 percent is caused by gasoline evaporation, leaving only 10 percent of hydrocarbon emissions emitted as tailpipe exhaust. And more than half of that 10 percent comes from heavy trucks and off-road equipment such as bulldozers. In short, car and light truck tailpipe emissions will account for only 4 to 5 percent of total hydrocarbons in the air by 1995. Yet that 4 to 5 percent is the major target of the costly Clean Air Act amendments.

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In the new legislation, Congress, as part of a two-step plan, specified a moderately reformulated fuel for nine metropolitan areas (including Los Angeles, New York, Houston, and Chicago) that have high or relatively high ozone levels. For the first phase, starting in 1995, all gasoline sold in those nine areas must incorporate a formula specified by the federal government. The revamped formula was worked out in recent regulatory negotiations among government, industry, and environmental groups. It is a reasonable solution, since it takes full advantage of the least costly method of reducing hydrocarbon emissions—lowering the vapor pressure of gasoline, which basically reduces fumes that otherwise would evaporate.

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legislation gives states three choices for compliance.

First, a state could opt out of the U.S. program, except in the nine metropolitan areas. That, in our opinion at Texaco, is the most sensible, most cost-effective way to go. Second, a state could require that the moderately reformulated fuel be sold in the entire state, thus imposing higher costs on areas that don't need it, with little benefit. It also would be wasteful, since reformulated fuels yield less mileage, according to the joint auto-oil industry study. Third, and worst of all, a state could adopt drastic requirements recently mandated in California. Those rules will require the statewide sale, by March of 1996, of a gasoline that is even more severely reformulated than the federally mandated fuels for 1995.

The California requirements are designed to meet that state's unique smog problem and should not serve as a model for the nation. The Los Angeles area has 140 days a year of unacceptably high ozone levels; New York City, only 20 such days, and the pollution is much less severe. California is also dependent on the automobile for transportation, whereas many other cities rely heavily on bus, subway, and rail transit.

But the proposed California fuels will not be cost-effective in California, much less elsewhere. They will provide little benefit beyond what the moderate federal formula fuel provides, reducing total hydrocarbons in the air by no more than 1 percent. In addition, like the new federal fuels proposed for the year 2000, the California formulas will increase the cost of

making a gallon of gasoline by 15 to 20 cents a gallon.

The California rules will affect both the motorist's wallet and the state's economy, since businesses would be at a competitive disadvantage with companies in states that do not have such onerous fuel costs. Were California to opt for the less expensive federal formula fuel, it could obtain three-quarters of the benefit for just one-quarter of the cost.

Look before you legislate

If severely reformulated gasolines are questionable in California, it would be ludicrous to try to apply them to many other states, where pollution problems are less severe and the climate is different. Yet that is exactly what may happen in many parts of the nation. Already, 11 eastern states and Washington, D.C., have agreed to adopt California's overall program for reducing ozone smog, which relies on changes to the vehicle rather than to the fuel. If these states go further, and agree to adopt California's fuel formula, they will be making a hasty, ill-informed decision. Connecticut, by contrast, is considering the more cost-effective solution of enhanced inspection and maintenance as the cornerstone of its program.

With public dollars in such short supply today, and the needs so great, national decisions must be grounded in a realistic assessment of our capabilities—recognizing that, although U.S. resources are considerable, they nevertheless are finite. Thus, the concept of cost-benefit relationships must be introduced at all levels of decision-making.

Government should provide incentives for the quicker retirement of older cars.

As is the case with so many contemporary issues, there is no quick-and-easy solution to air pollution. But there are solutions. To find them, we need a long-term, comprehensive effort, based on good science and cost-effectiveness, not on politics, emotion, or wishful thinking.

Texaco and others in the oil industry are working to clarify and expand the options. We are willing to do our share to reduce pollution—as long as it is done cost-effectively. Two years ago, Texaco initiated the most extensive research program in history on air pollution, the gasoline engine, and fuels. Thirteen other major oil companies and the big-three U.S. automakers joined our effort to find cost-effective ways of further cutting vehicle emissions.

Thus far, one of the research group's most important conclusions is this: Capturing fumes that normally evaporate is much more cost-effective in cutting hydrocarbon emissions than drastically reformulated gasolines.

Fumes can be captured in three basic ways. One would be to install on all cars a device called an on-board vapor recovery canister, which sucks fumes into the engine

and burns them as fuel. Cars already have a small canister to capture the fumes that evaporate while a car is parked, but it is too small to handle the volume of vapor created in refueling. According to an Office of Technology Assessment study, an additional canister would prevent a ton of hydrocarbons from entering the atmosphere, at a cost of \$1,200 per ton.

Installing special nozzles on gasoline pumps also can do the trick. The nozzles capture the gases and recirculate them through an underground tank. Cost: \$2,400 per ton of hydrocarbons prevented from entering the atmosphere, according to an oil industry study.

The third way to reduce fumes is by lowering fuel vapor pressure, which can be done simply by reducing the amount of butane in gasoline. This would cost \$3,500 per ton of hydrocarbons, according to an oil industry study.

The oil industry favors installing the canisters because the cost is less and because research indicates that a much higher percentage of fumes are captured by the on-board canisters than by nozzles.

What's most important to understand, however, is that all of these methods would be more cost-effective than either the moderate or drastic gasoline reformulation. The moderately reformulated federal fuel, which would require reducing butane but also adding oxygenates, would cut hydrocarbon emissions at a cost of \$10,000 a ton. But the whopper cost would come from the proposed drastic reformulation, similar to the new California formula. Texaco estimates its cost at \$200,000 a ton and possibly much more.

This sky-high \$200,000 figure may seem unbelievable, but it results, as I stated before, from the need to install expensive new equipment at refineries. And although this can be only a rough estimate, there is no doubt that drastic reformulation will be much less cost-effective than the alternatives.

Before we make such a huge mistake, we should consider more commonsense measures—things we can do right now—to protect the environment, while ensuring that the American motorist has adequate supplies of affordable energy.

First, provide incentives for the quicker retirement of older cars. Cars built before 1975 account for just 7 percent of all the miles driven in this country but produce 25 percent of automobile emissions. It would be far more cost-effective to get them off the road than to spend billions on unnecessary, severely reformulated fuels. This could be

done through tax incentives or government-funded repurchase programs.

Second, fully enforce inspection and maintenance laws. Most states do not have effective programs, and local officials shy away from them because they hit the motorist directly in the pocket-book. Although not a single state has fully implemented the U.S. Environmental Protection Agency's enhanced inspection and maintenance program, there is now an incentive to do so. Under the Clean Air Act amendments, states must reduce hydrocarbon emissions from all sources by at least 24 percent from 1990 levels by 1999. The EPA estimates that about 40 percent of this reduction could be achieved from fully implementing its inspection program.

Third, stop subsidizing older cars. Most taxes and fees on cars in the United States decline as a car

gets older. That encourages people to keep their old clunkers. By contrast, in Japan, for instance, taxes and fees remain high as a car ages. This, along with a tough inspection and maintenance program, gives the Japanese motorist an incentive to turn in the old car for a newer one. Because such a change could place an unfair burden on the less affluent, tax credits or other help could be targeted to lower-income motorists. The cost to society would be far less than imposing unnecessary gasoline reformulation on millions who don't need it.

The point is that there are things we can do—sensible, cost-effective things—to clean up the atmosphere without breaking the bank. We at Texaco believe that the public will benefit most if we first exhaust all the lower-cost options. There is no need to waste billions of dollars when other, less costly solutions are at hand.

March 17, 1992

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NOx contribute to ground-level ozone, an ingredient of smog, and also cause acid rain. Because NOx are nutrients, they further degrade water quality by fueling algal blooms in Pennsylvania's lakes, streams and the Chesapeake Bay.

LEVs are the most cost-effective way to meet the CAA's ozone reduction requirements. The California Air Resources Board estimates that LEV technology will add between \$70-\$170 to the price of a car depending on the model. Reducing emissions which form ozone at the tailpipe costs \$800 - \$1400 per ton of reduction as compared to upwards of \$15,000 per ton of reduction for industrial sources. Requiring new car buyers to bear some of the cost of controlling air pollution is a fair and prudent way to pay for cleaner air, clearer water and healthier people.

We urge you to resist the pressures to drop the provision from HB 2196 to allow the state to require low emission vehicles. LEVs are the only long-term way to address ozone and acid rain pollution in the face of the rising population and the increasing number of cars on our roads.

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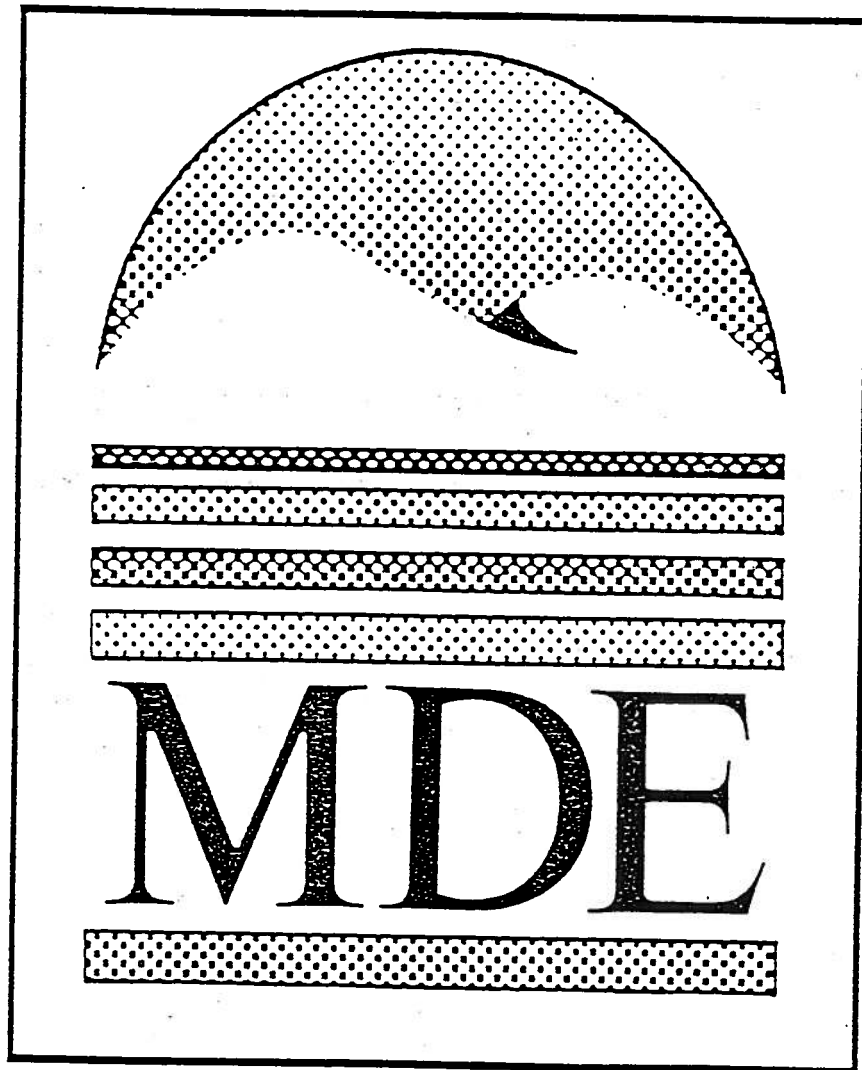
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Pa. Federation of Sportsmen's Clubs

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**Cutting Through the Rhetoric:
A Discussion of
Low Emissions Vehicle Issues**



Maryland Department of the Environment

March 3, 1992

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Equally important is the fact that comparisons are being made between a state with a land area of over 150,000 square miles and one with under 10,000 square miles. On an equivalent area basis, the ozone problem in California would have to be compared to that in the combined area of Northern Virginia, the District of Columbia, Maryland, Delaware, Pennsylvania, New York, New Jersey, Connecticut, Rhode Island, Massachusetts, Vermont, and New Hampshire. This area represents, with the exclusion of Maine, the area covered by the Ozone Transport Commission. When one considers the fact that the population density in this northeast area is approximately 2.5 times that of California, the extent of the northeast ozone problem becomes evident. Ozone recognizes no state boundaries. The problem in the northeast is as pervasive as that in California.

IMPACT ON THE PETROLEUM INDUSTRY

Simply stated, adoption of the LEV Program will not require the sale of California reformulated gasoline in Maryland. This issue has been discussed ad nauseam, and the Administration's bill was modified to explicitly separate the LEV issue from any California fuel requirement.

Claims that "someone" will require states that adopt the LEV Program to also adopt California reformulated gasoline requirements are simply unfounded. Even if our air pollution reduction strategies do not meet the goals we project, it will be up to MDE to select the programs necessary to make up the shortfall. We cannot be forced to adopt any non-mandatory program.

104 vs 14 / we won't need it in PA
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The petroleum industry would incur no additional burden under the Maryland LEV proposal. Whether we adopt the LEV program or not, we expect the petroleum industry to sell federal reformulated gasoline in Maryland beginning in 1995 as required under the federal Clean Air Act. Nothing more, nothing less.

VEHICLE WARRANTY IMPACTS

Of late, both the automotive and petroleum industries have been advancing the argument that automakers will not warranty LEVs which do not burn California reformulated gasoline. However, the United States Environmental Protection Agency (USEPA) is the only entity which can make such a determination. Vehicle emissions warranty coverage is a requirement, not a discretionary policy. Automakers have no more control over the fuel sold in the U.S. than the petroleum industry has over the vehicles their fuel is burned in. It is the responsibility of the USEPA to ensure that the two are compatible.

The USEPA ensures vehicle/ fuel compatibility by requiring that all gasoline sold in the U.S. be either "substantially similar" to the gasoline on which the vehicle was originally certified for sale, or demonstrate through scientific testing that an alternative formulation not "substantially similar" will not degrade vehicle emissions or performance. All current and proposed reformulated gasoline specifications - both federal and California - meet the USEPA definition of "substantially similar". Automakers have no choice but to warranty vehicles certified on California reformulated gasoline and operated on federal reformulated gasoline.

A better understanding of this situation results from a look at the variability in specifications of gasoline on the market today. None is equivalent to the formulation used for emissions certification purposes, yet all meet warranty eligibility requirements. Gasoline is not a pure chemical. It is therefore subject to widely ranging formulations between refiners, and even within the same refinery. Reformulated gasoline specifications simply represent an effort to standardize gasoline formulations. In fact, the variability between federal and California reformulated gasoline specifications is likely to be less than that of two currently commercially-available gasolines.

Another important point to remember is that, like everyone else, Californians actually drive beyond state boundaries. Will they risk losing their warranty coverage when they drive into Nevada and fill their fuel tanks with gasoline which does not meet California reformulated gasoline specifications?

Automakers have no authority to refuse warranty coverage to vehicles burning legally saleable gasoline; whether that gasoline meets federal reformulated or California reformulated specifications.

IMPACT OF CLEAN AIR ACT FLEET PROVISIONS

Under the federal Clean Air Act, fleets of 10 or more vehicles in the Baltimore and Washington metropolitan areas will have to purchase LEVs even if the LEV program is not adopted. Since fleet sales account for as much as 30% of new vehicle sales, Maryland auto dealers will be selling LEVs. Interestingly, if automakers could insist on the use of California reformulated gasoline in LEVs, this fleet program would require the petroleum industry to supply it and, if only supplied directly to the fleet refueling stations, would prohibit fleet vehicles from refueling at retail gasoline outlets!

This fleet requirement makes it likely that one of the most controversial issues surrounding the LEV Program, that of interstate sales, is not really an issue at all.

REGISTRATION ISSUES

The issue of most concern to Maryland auto dealers is that of interstate sales. To understand this issue, one must understand that there are currently three different ways a vehicle can be certified for sale in the U.S. A vehicle may be certified for sale in all 50 states (50-state vehicle), all states but California (49-state vehicle), or only in California (California-only vehicle). Therefore, in any given state, two of these three vehicle types may be sold. Outside of California, an individual may legally purchase either a 49-state or 50-state vehicle. In California, and in Maryland if we adopt the LEV Program, purchases of either 50-state or California-only vehicles are legal. The interstate issue exists only to the extent that automakers fail to take the steps necessary to receive a 50-state certification.

The federal Clean Air Act fleet provisions will in all likelihood render the interstate issue moot. Since current California vehicle sales are limited to California, automakers can certify vehicles as California-only vehicles without a market penalty. However, once sales of such vehicles are mandated outside California (as is the case with the Clean Air Act fleet provisions) automakers will be forced to certify all fleet-bound LEVs as 50-state vehicles. Therefore, it seems likely that the majority of California certifications will be 50-state certifications in the future. As a result, it is irrelevant to compare current certification practices to arrive at the conclusion that interstate sales will be prohibited.

LACK OF ANALYSIS OF LEV BENEFITS

Claims that MDE has not evaluated the benefits associated with adoption of the LEV Program are simply fabrications. Equally important is the fact that LEV opponents are making it appear as though the USEPA has analyzed the program using a computer model and determined that there is little or no benefit to adoption. To clarify this issue, it should be noted that an EPA computer model named MOBILE4.1 is the accepted model in the automotive emissions field. It is used by automakers, the petroleum industry, and state and federal regulators to evaluate motor vehicle emissions control strategies.

The USEPA has not provided any estimates on the effectiveness of the LEV Program in reducing emissions. In fact, the computer model as it exists cannot even predict LEV benefits. Its internal computer code must be modified to accomplish the task. The petroleum industry, automakers, and MDE have all undertaken such modification and have analyzed the projected benefits of the program. Differences in projections result from differing assumptions of the future. MDE's analysis shows significant benefits. For example, the air pollution reductions resulting from implementation of the LEV program are equal to the reductions which would be obtained by eliminating 25 million miles of vehicle travel daily or eliminating the emissions of 470 breweries, or 14 Bethlehem Steels.

Of serious concern is the fact that automakers and the petroleum industry are portraying MDE's analysis as incomplete or nonexistent. MDE has met with representatives of these industries to discuss modeling issues at a very technical level and has been praised by both for the level of detail and comprehensiveness of our analysis. This is not to say that we agree on every assumption, but we have reached a point where all parties understand the basis of the other's analyses. Only the future holds all the answers, but we believe that our projections are excellent. If anything, they are conservative estimates of the benefits of the LEV Program.

OTHER AVAILABLE CONTROLS

Claims have been made that MDE is ignoring alternative pollution control strategies which would provide greater benefits, at a lower cost, than the LEV Program. This simply is not the case.

MDE has included in its analysis every current and future motor vehicle emission control, including: new federal standards, phase II gasoline volatility control, federal reformulated gasoline, enhanced evaporative controls, transient/ evaporative I/M, Stage II refueling controls, and transportation control measures. We have been open and above board on these issues and again have privately received positive comments on our analyses.

COSTS OF LEVs

As with benefit projections, there are widely differing assessments of the cost of LEVs. However, of greater concern are the figures being projected for the cost of gasoline. As already explained, there are no fuel requirements associated with the adoption of the LEV Program in Maryland. We can definitively say that there will be no increase in the price of gasoline associated with the adoption of the program.

California continues, nearly two years after their initial assessment, to project costs in the \$170 per vehicle range. Automakers project costs of approximately \$1000 per vehicle. MDE continues to believe that automakers have grossly overstated their figures, including such costs as a dedicated battery to preheat electrically heated catalyst (EHC) systems. MDE is aware of functioning EHC systems which utilize available capacity in the vehicle's standard battery. It is also interesting to note that less than two years ago, EHC preheat strategies were as long as 30 seconds before engine start. Preheat time is now down to 5 seconds or less, and in some EHC strategies preheat is avoided altogether. Estimates by a private company conducting EHC development in Maryland place the cost of such systems at around \$270 per vehicle.

We believe the real cost of vehicle production is far more likely to be in the range estimated by California than that estimated by the automaking industry. Automakers and petroleum companies have historically overestimated the cost of pollution controls. In Maryland, one only has to look back a few years to when petroleum industry sources were projecting cost increases of up to 10 cents per gallon due to the adoption of gasoline vapor pressure requirements. Compare these estimates with the reality of a less than one cent per gallon increase. In fact, one cent per gallon per pound reduction has now become the accepted cost for volatility control, even within the petroleum industry.

SUMMARY

MDE recognizes the uncertainty surrounding any program which pushes technology. However, we also realize that we can't get there from here. We can't achieve clean air goals without cleaner vehicles. So while it is important to debate and to revise analyses as new data and information become available, it is equally important not to get bogged down by extraneous issues or misinformation. We continue to believe that the LEV Program is a critical part of Maryland's clean air strategy and urge early adoption of enabling legislation. There are enough safeguards built into the adoption process to allow Maryland to abort should California elect to go down a route which is unpalatable to Marylanders. Further study by "blue ribbon panels" is only a delaying tactic, as such study will take place informally throughout the next several years.

To defeat the LEV bill in Maryland sends the wrong message to other states in the region. It would indicate that Maryland is not willing to move forward and that other states should delay their own clean air decisions. Instead, we can send a clear message: Maryland is serious about solving our air quality problems and we expect other states to do the same. Only by such action can we avoid the pitfalls associated with continued bureaucratic delay.

THE STATE OF
PENNSYLVANIA

VS.

CALIFORNIA

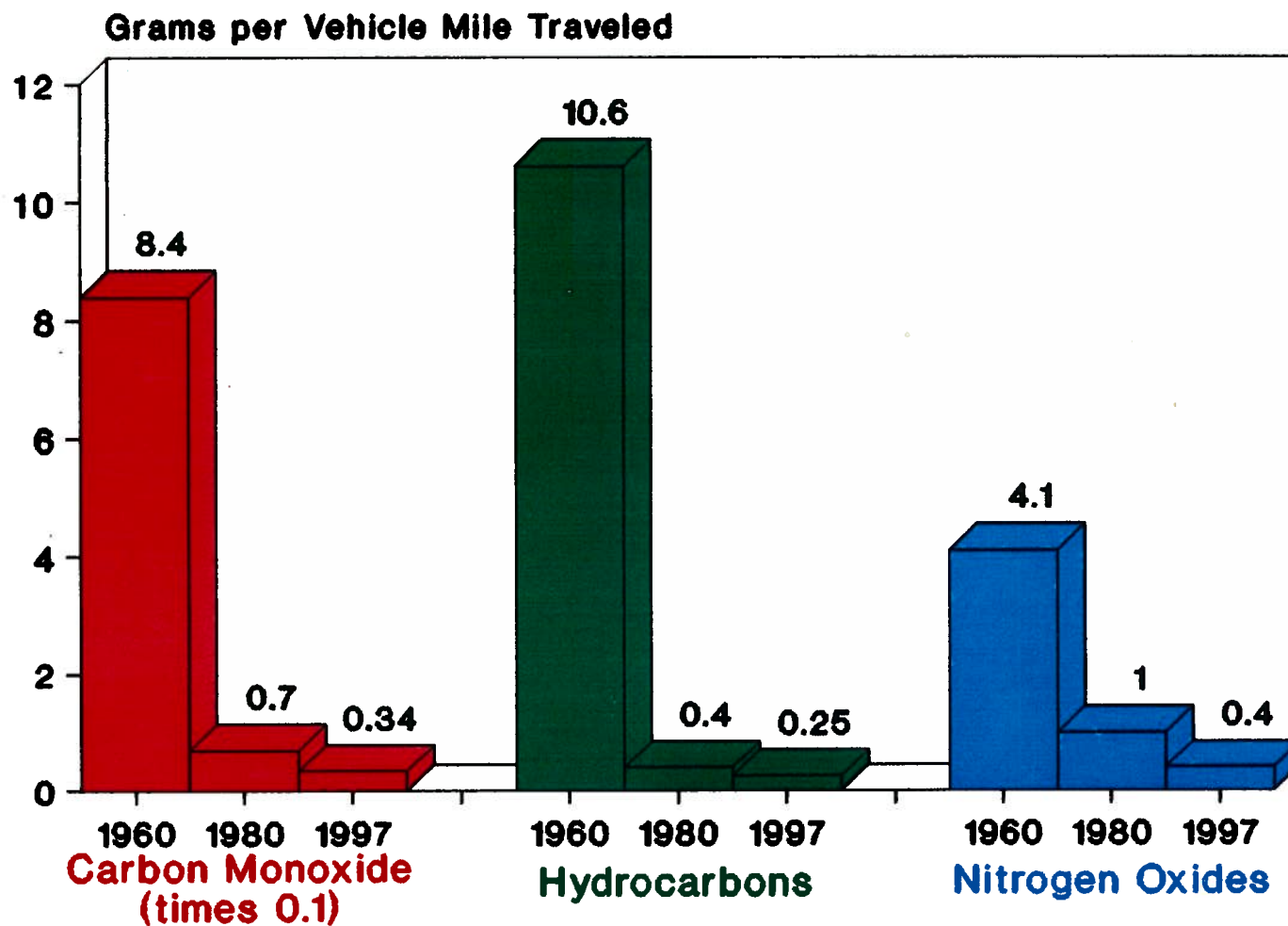
**COMPARISON OF OZONE AND CARBON
MONOXIDE EXCEEDANCE DATA**

LIGHT DUTY VEHICLE 50K EMISSION STANDARDS (G/MI)
(FLEET AVERAGE STANDARDS)

CURRENT FLEET	CALIFORNIA				FEDERAL (CAA)			
	NMHC	CO	NOX	PM	NMHC	CO	NOX	PM
	0.39	7.0	0.40	0.08	0.41	3.4	1.0	0.20
1993	0.25	3.4	0.40	0.08	0.41	3.4	1.0	0.20
1994	0.25 *	3.4	0.40	0.08	0.34	3.4	0.76	0.15
1995	0.231 *	3.4	0.40	0.08	0.28	3.4	0.52	0.10
1996	0.225 *	3.4	0.40	0.08	0.25	3.4	0.40	0.08
1997	0.202 *	3.37	0.39	0.08	0.25	3.4	0.40	0.08

NMOG*

EMISSION REDUCTION PROGRESS



CALIFORNIA'S STATE IMPLEMENTATION PLAN FOR CLEAN AIR "THE MOST SEVERE AIR QUALITY PLAN IN THE WORLD"



UNIQUE CHARACTERISTICS:

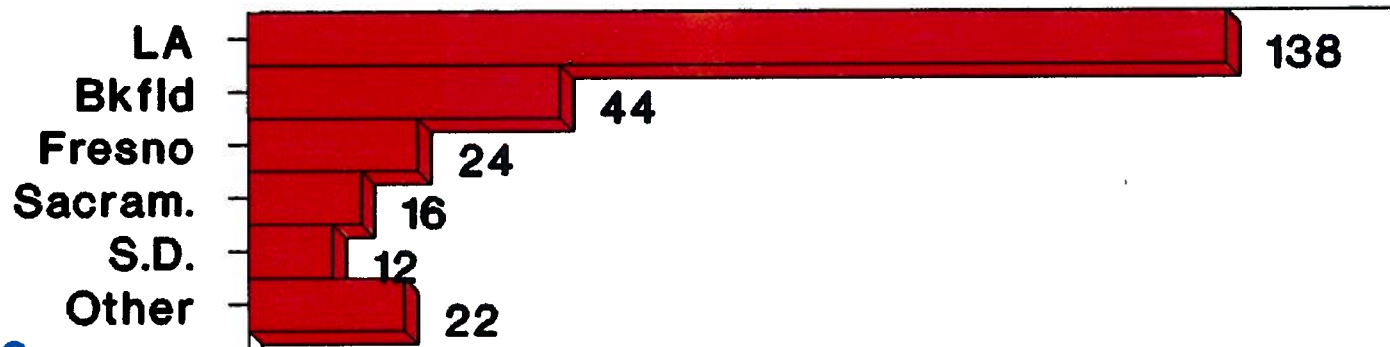
- 30 MILLION POPULATION
- 23 MILLION VEHICLES
- 5TH LARGEST ECONOMY IN WORLD (GNP)
- 3RD LARGEST MOGAS CONSUMPTION IN WORLD
- MAJOR AIR BASINS
- BY FAR, WORST AIR QUALITY IN USA

RESPONSE:

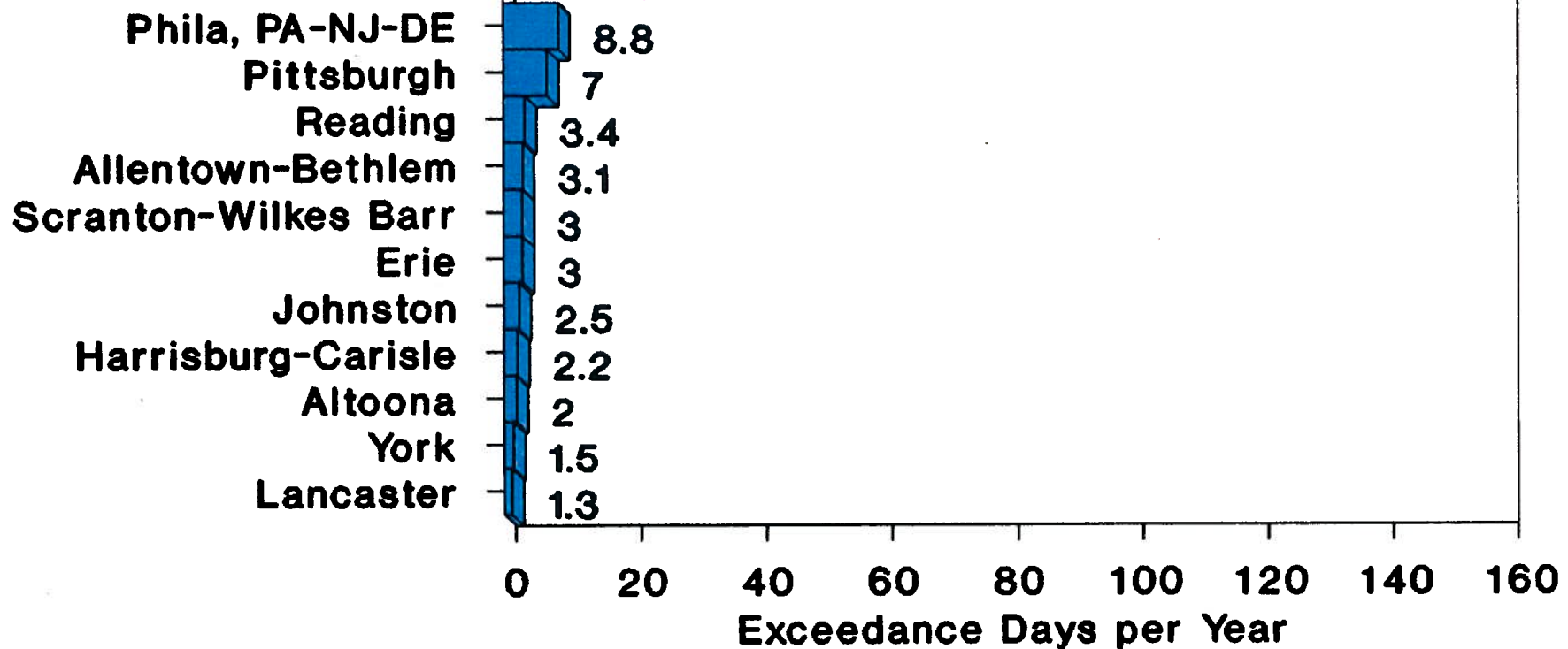
- ENORMOUS TECHNICAL/REGULATORY STRUCTURE
 - CARB/CEC 1000 + EMPLOYEES
 - SCAQMD 1100 + EMPLOYEES
- ADOPTION OF EXTREME CONTROL MEASURES
- CALIFORNIA LEV PROGRAM
 - 2 YEARS, 30 WORKSHOPS, HEARINGS, CONSULTANT STUDIES
 - EXPANSIVE DIALOGUE, STAFF, AUTO/OIL, ACADEMIA, EPA
 - 207 PAGE RULE AND STILL DEVELOPING
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AVERAGE OZONE EXCEEDANCES

California

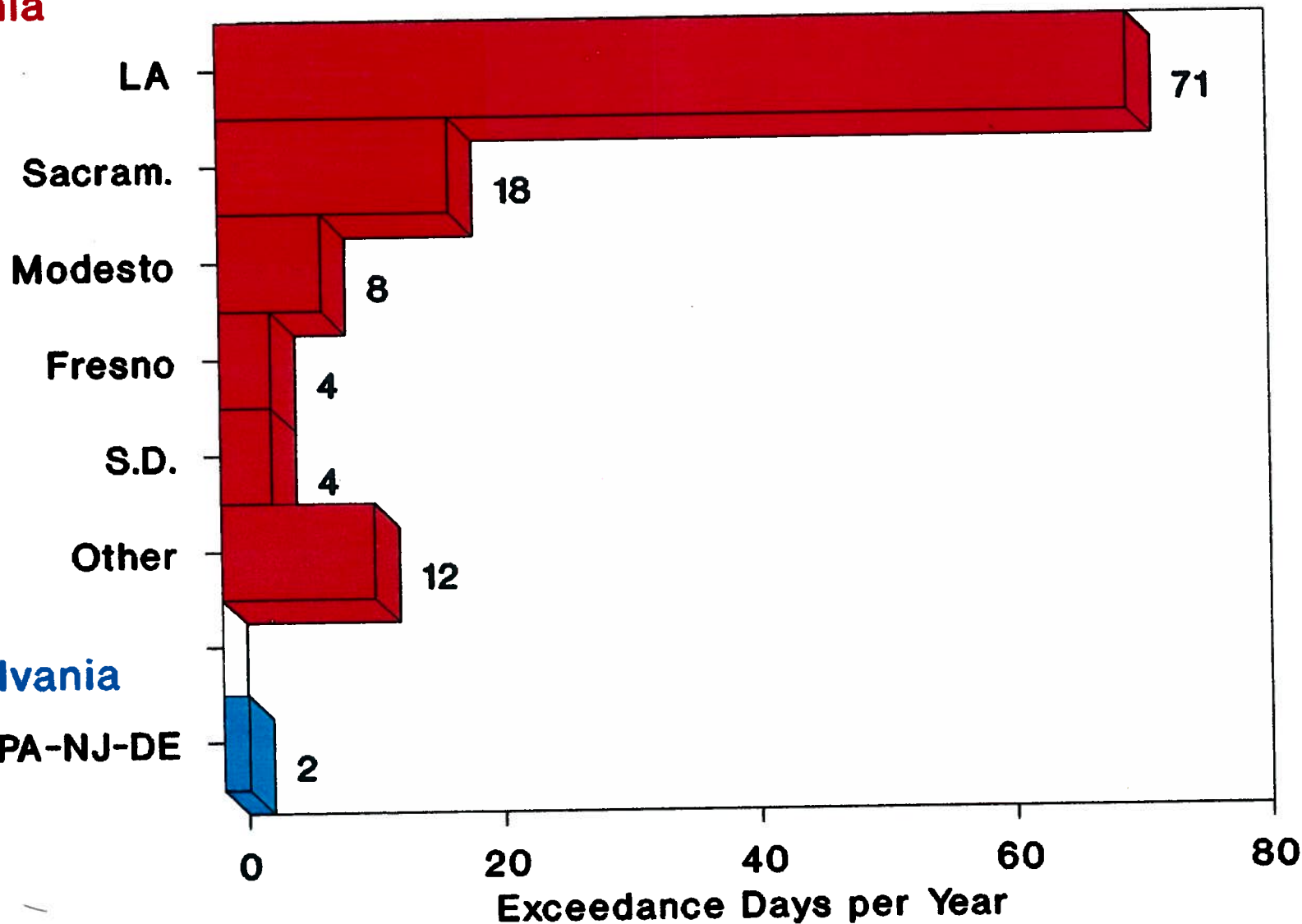


Pennsylvania



AVERAGE CO EXCEEDANCES

California



Pennsylvania

Phila. PA-NJ-DE

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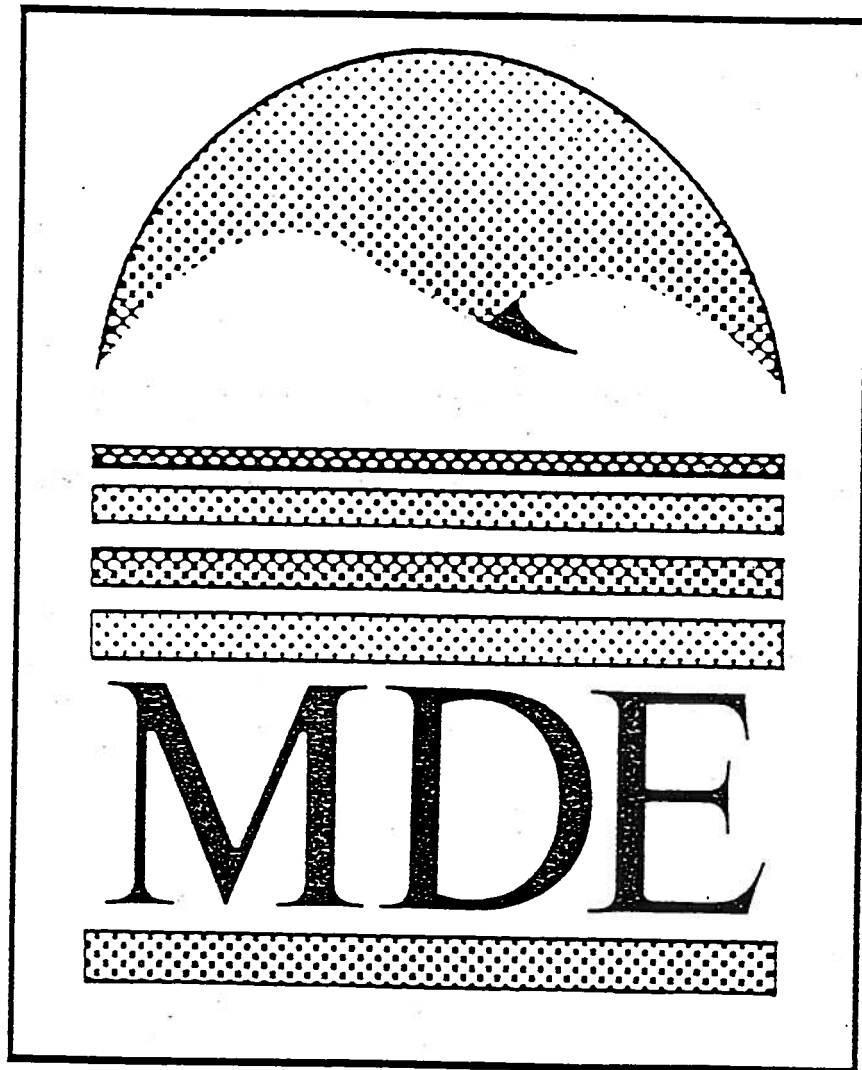
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VEHICLE WARRANTY IMPACTS

Of late, both the automotive and petroleum industries have been advancing the argument that automakers will not warranty LEVs which do not burn California reformulated gasoline. However, the United States Environmental Protection Agency (USEPA) is the only entity which can make such a determination. Vehicle emissions warranty coverage is a requirement, not a discretionary policy. Automakers have no more control over the fuel sold in the U.S. than the petroleum industry has over the vehicles their fuel is burned in. It is the responsibility of the USEPA to ensure that the two are compatible.

The USEPA ensures vehicle/ fuel compatibility by requiring that all gasoline sold in the U.S. be either "substantially similar" to the gasoline on which the vehicle was originally certified for sale, or demonstrate through scientific testing that an alternative formulation not "substantially similar" will not degrade vehicle emissions or performance. All current and proposed reformulated gasoline specifications - both federal and California - meet the USEPA definition of "substantially similar". Automakers have no choice but to warranty vehicles certified on California reformulated gasoline and operated on federal reformulated gasoline.

A better understanding of this situation results from a look at the variability in specifications of gasoline on the market today. None is equivalent to the formulation used for emissions certification purposes, yet all meet warranty eligibility requirements. Gasoline is not a pure chemical. It is therefore subject to widely ranging formulations between refiners, and even within the same refinery. Reformulated gasoline specifications simply represent an effort to standardize gasoline formulations. In fact, the variability between federal and California reformulated gasoline specifications is likely to be less than that of two currently commercially-available gasolines.

Another important point to remember is that, like everyone else, Californians actually drive beyond state boundaries. Will they risk losing their warranty coverage when they drive into Nevada and fill their fuel tanks with gasoline which does not meet California reformulated gasoline specifications?

Automakers have no authority to refuse warranty coverage to vehicles burning legally saleable gasoline; whether that gasoline meets federal reformulated or California reformulated specifications.

IMPACT OF CLEAN AIR ACT FLEET PROVISIONS

Under the federal Clean Air Act, fleets of 10 or more vehicles in the Baltimore and Washington metropolitan areas will have to purchase LEVs even if the LEV program is not adopted. Since fleet sales account for as much as 30% of new vehicle sales, Maryland auto dealers will be selling LEVs. Interestingly, if automakers could insist on the use of California reformulated gasoline in LEVs, this fleet program would require the petroleum industry to supply it and, if only supplied directly to the fleet refueling stations, would prohibit fleet vehicles from refueling at retail gasoline outlets!

This fleet requirement makes it likely that one of the most controversial issues surrounding the LEV Program, that of interstate sales, is not really an issue at all.

REGISTRATION ISSUES

The issue of most concern to Maryland auto dealers is that of interstate sales. To understand this issue, one must understand that there are currently three different ways a vehicle can be certified for sale in the U.S. A vehicle may be certified for sale in all 50 states (50-state vehicle), all states but California (49-state vehicle), or only in California (California-only vehicle). Therefore, in any given state, two of these three vehicle types may be sold. Outside of California, an individual may legally purchase either a 49-state or 50-state vehicle. In California, and in Maryland if we adopt the LEV Program, purchases of either 50-state or California-only vehicles are legal. The interstate issue exists only to the extent that automakers fail to take the steps necessary to receive a 50-state certification.

The federal Clean Air Act fleet provisions will in all likelihood render the interstate issue moot. Since current California vehicle sales are limited to California, automakers can certify vehicles as California-only vehicles without a market penalty. However, once sales of such vehicles are mandated outside California (as is the case with the Clean Air Act fleet provisions) automakers will be forced to certify all fleet-bound LEVs as 50-state vehicles. Therefore, it seems likely that the majority of California certifications will be 50-state certifications in the future. As a result, it is irrelevant to compare current certification practices to arrive at the conclusion that interstate sales will be prohibited.

LACK OF ANALYSIS OF LEV BENEFITS

Claims that MDE has not evaluated the benefits associated with adoption of the LEV Program are simply fabrications. Equally important is the fact that LEV opponents are making it appear as though the USEPA has analyzed the program using a computer model and determined that there is little or no benefit to adoption. To clarify this issue, it should be noted that an EPA computer model named MOBILE4.1 is the accepted model in the automotive emissions field. It is used by automakers, the petroleum industry, and state and federal regulators to evaluate motor vehicle emissions control strategies.

The USEPA has not provided any estimates on the effectiveness of the LEV Program in reducing emissions. In fact, the computer model as it exists cannot even predict LEV benefits. Its internal computer code must be modified to accomplish the task. The petroleum industry, automakers, and MDE have all undertaken such modification and have analyzed the projected benefits of the program. Differences in projections result from differing assumptions of the future. MDE's analysis shows significant benefits. For example, the air pollution reductions resulting from implementation of the LEV program are equal to the reductions which would be obtained by eliminating 25 million miles of vehicle travel daily or eliminating the emissions of 470 breweries, or 14 Bethlehem Steels.

Of serious concern is the fact that automakers and the petroleum industry are portraying MDE's analysis as incomplete or nonexistent. MDE has met with representatives of these industries to discuss modeling issues at a very technical level and has been praised by both for the level of detail and comprehensiveness of our analysis. This is not to say that we agree on every assumption, but we have reached a point where all parties understand the basis of the other's analyses. Only the future holds all the answers, but we believe that our projections are excellent. If anything, they are conservative estimates of the benefits of the LEV Program.

OTHER AVAILABLE CONTROLS

Claims have been made that MDE is ignoring alternative pollution control strategies which would provide greater benefits, at a lower cost, than the LEV Program. This simply is not the case.

MDE has included in its analysis every current and future motor vehicle emission control, including: new federal standards, phase II gasoline volatility control, federal reformulated gasoline, enhanced evaporative controls, transient/ evaporative I/M, Stage II refueling controls, and transportation control measures. We have been open and above board on these issues and again have privately received positive comments on our analyses.

COSTS OF LEVs

As with benefit projections, there are widely differing assessments of the cost of LEVs. However, of greater concern are the figures being projected for the cost of gasoline. As already explained, there are no fuel requirements associated with the adoption of the LEV Program in Maryland. We can definitively say that there will be no increase in the price of gasoline associated with the adoption of the program.

California continues, nearly two years after their initial assessment, to project costs in the \$170 per vehicle range. Automakers project costs of approximately \$1000 per vehicle. MDE continues to believe that automakers have grossly overstated their figures, including such costs as a dedicated battery to preheat electrically heated catalyst (EHC) systems. MDE is aware of functioning EHC systems which utilize available capacity in the vehicle's standard battery. It is also interesting to note that less than two years ago, EHC preheat strategies were as long as 30 seconds before engine start. Preheat time is now down to 5 seconds or less, and in some EHC strategies preheat is avoided altogether. Estimates by a private company conducting EHC development in Maryland place the cost of such systems at around \$270 per vehicle.

We believe the real cost of vehicle production is far more likely to be in the range estimated by California than that estimated by the automaking industry. Automakers and petroleum companies have historically overestimated the cost of pollution controls. In Maryland, one only has to look back a few years to when petroleum industry sources were projecting cost increases of up to 10 cents per gallon due to the adoption of gasoline vapor pressure requirements. Compare these estimates with the reality of a less than one cent per gallon increase. In fact, one cent per gallon per pound reduction has now become the accepted cost for volatility control, even within the petroleum industry.

SUMMARY

MDE recognizes the uncertainty surrounding any program which pushes technology. However, we also realize that we can't get there from here. We can't achieve clean air goals without cleaner vehicles. So while it is important to debate and to revise analyses as new data and information become available, it is equally important not to get bogged down by extraneous issues or misinformation. We continue to believe that the LEV Program is a critical part of Maryland's clean air strategy and urge early adoption of enabling legislation. There are enough safeguards built into the adoption process to allow Maryland to abort should California elect to go down a route which is unpalatable to Marylanders. Further study by "blue ribbon panels" is only a delaying tactic, as such study will take place informally throughout the next several years.

To defeat the LEV bill in Maryland sends the wrong message to other states in the region. It would indicate that Maryland is not willing to move forward and that other states should delay their own clean air decisions. Instead, we can send a clear message: Maryland is serious about solving our air quality problems and we expect other states to do the same. Only by such action can we avoid the pitfalls associated with continued bureaucratic delay.

THE STATE OF
PENNSYLVANIA

VS.

CALIFORNIA

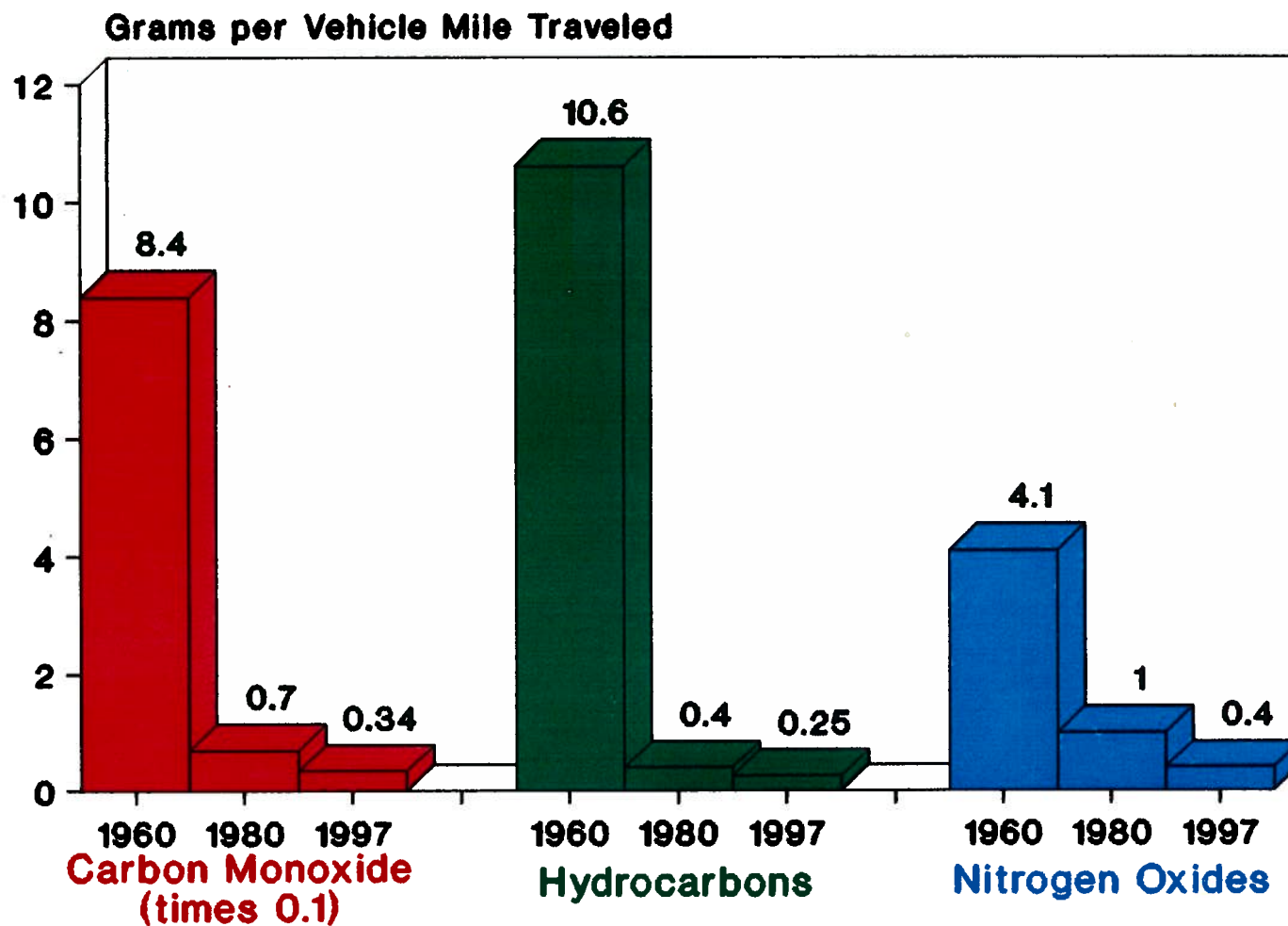
**COMPARISON OF OZONE AND CARBON
MONOXIDE EXCEEDANCE DATA**

LIGHT DUTY VEHICLE 50K EMISSION STANDARDS (G/MI)
(FLEET AVERAGE STANDARDS)

	CALIFORNIA				FEDERAL (CAA)			
CURRENT FLEET	NMHC	CO	NOX	PM	NMHC	CO	NOX	PM
	0.39	7.0	0.40	0.08	0.41	3.4	1.0	0.20
1993	0.25	3.4	0.40	0.08	0.41	3.4	1.0	0.20
1994	0.25 *	3.4	0.40	0.08	0.34	3.4	0.76	0.15
1995	0.231 *	3.4	0.40	0.08	0.28	3.4	0.52	0.10
1996	0.225 *	3.4	0.40	0.08	0.25	3.4	0.40	0.08
1997	0.202 *	3.37	0.39	0.08	0.25	3.4	0.40	0.08

NMOG*

EMISSION REDUCTION PROGRESS



CALIFORNIA'S STATE IMPLEMENTATION PLAN FOR CLEAN AIR "THE MOST SEVERE AIR QUALITY PLAN IN THE WORLD"



UNIQUE CHARACTERISTICS:

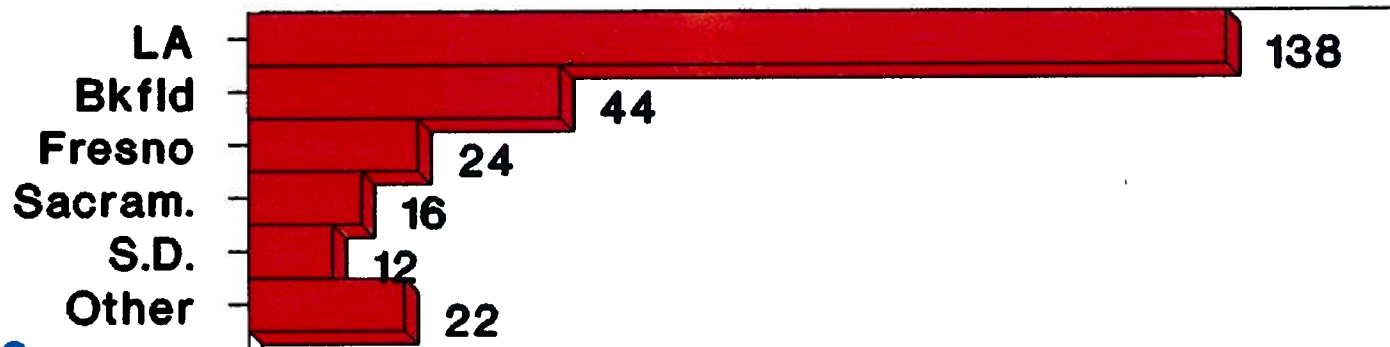
- 30 MILLION POPULATION
- 23 MILLION VEHICLES
- 5TH LARGEST ECONOMY IN WORLD (GNP)
- 3RD LARGEST MOGAS CONSUMPTION IN WORLD
- MAJOR AIR BASINS
- BY FAR, WORST AIR QUALITY IN USA

RESPONSE:

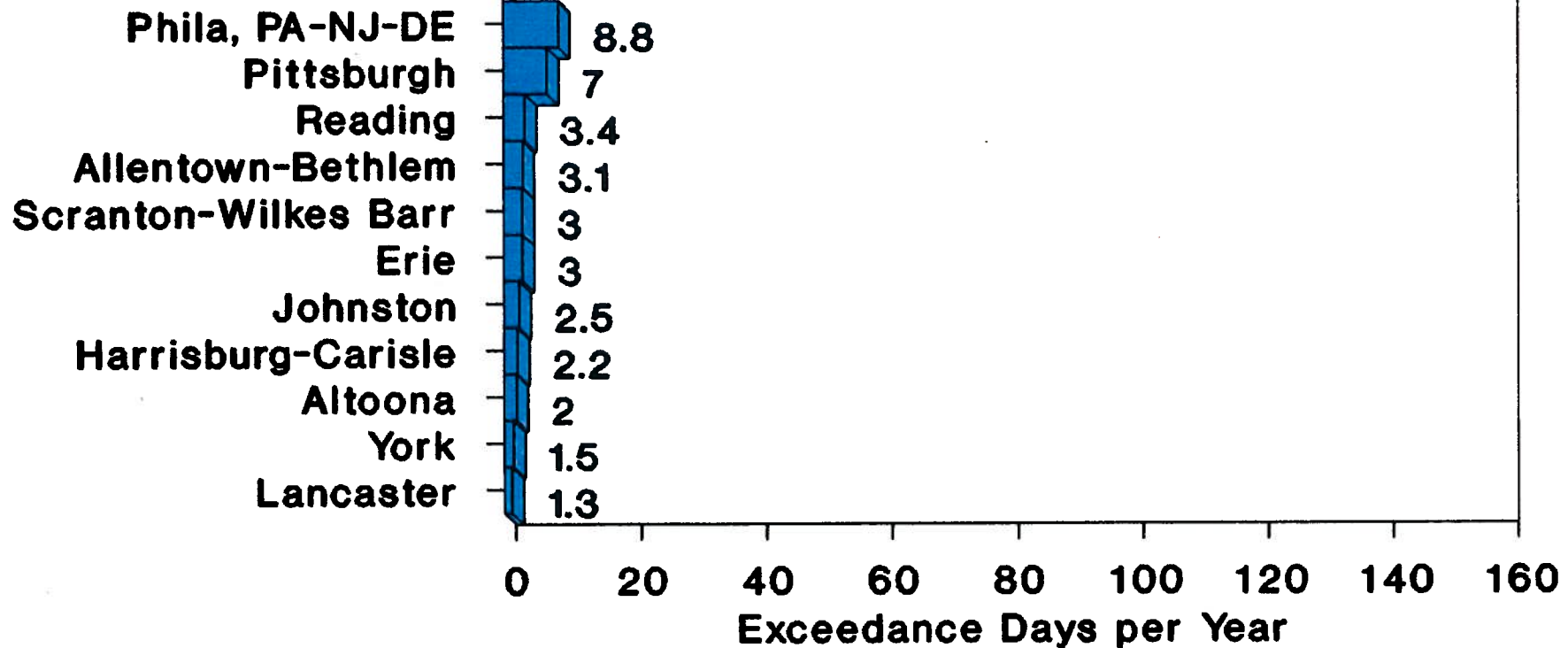
- ENORMOUS TECHNICAL/REGULATORY STRUCTURE
 - CARB/CEC 1000 + EMPLOYEES
 - SCAQMD 1100 + EMPLOYEES
- ADOPTION OF EXTREME CONTROL MEASURES
- CALIFORNIA LEV PROGRAM
 - 2 YEARS, 30 WORKSHOPS, HEARINGS, CONSULTANT STUDIES
 - EXPANSIVE DIALOGUE, STAFF, AUTO/OIL, ACADEMIA, EPA
 - 207 PAGE RULE AND STILL DEVELOPING
 - 100'S OF EMPLOYEES
 - \$20 MILLION/YEAR BUDGET AND GROWING

AVERAGE OZONE EXCEEDANCES

California

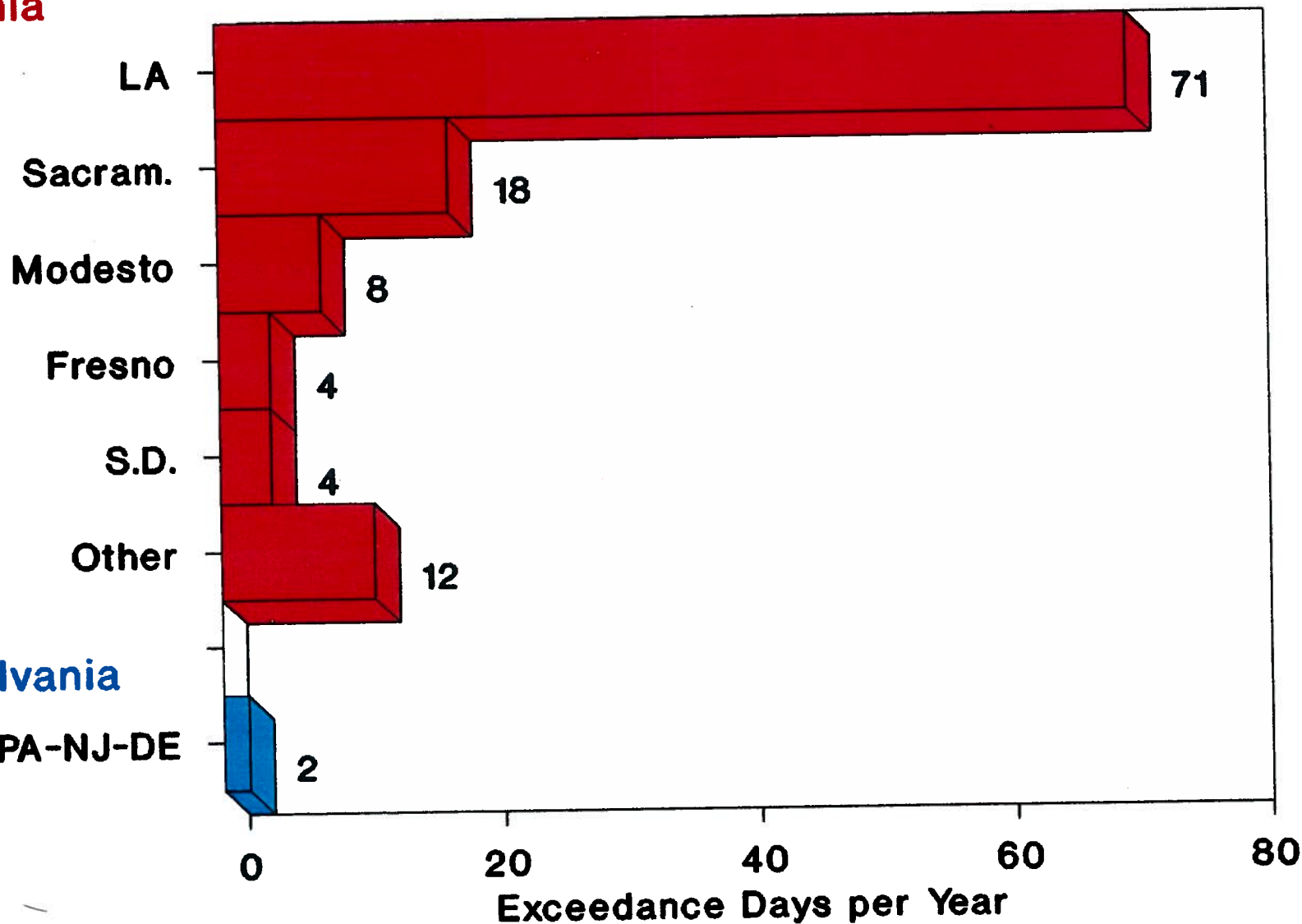


Pennsylvania



AVERAGE CO EXCEEDANCES

California



Pennsylvania

Phila. PA-NJ-DE