**The original documents are located in Box C22, folder "Presidential Handwriting, 5/23/1975 (1)" of the Presidential Handwriting File at the Gerald R. Ford Presidential Library.**

THE WHITE HOUSE

WASHINGTON

May 23, 1975

ADMINISTRATIVELY CONFIDENTIAL

MEMORANDUM FOR: JIM CANNON

FROM: JERRY H. JONES

SUBJECT: Auto Emission Standards

Your memorandum to the President of May 19 on the above subject has been reviewed and the following notation was made:

-- Issue #1 - I prefer Alt. B with an accompanying message pointing out hard choices.

Issue #2 - If we go with this I go for Option #3.

We should be prepared when Congress reconvenes.

Please follow-up with the appropriate action.

Thank you.

cc: Don Rumsfeld
Jim Lynn

THE WHITE HOUSE
WASHINGTON

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Jim Cannon

Zone #1 – 2 prefer
alt B. with an accompany
message pointing out hard
choices.

Zone #2 – If we
go with this 2 go
for Option #3.
We should be prepared
when Congress reconvenes.

ACTION

THE WHITE HOUSE

WASHINGTON

May 19, 1975

MEMORANDUM FOR: THE PRESIDENT

FROM: JIM CANNON

SUBJECT: AUTO EMISSION STANDARDS

Summary

The Congress now has before it from the Administration two different sets of recommended auto emission standards for 1977-1981 model year cars: (a) your January 30 proposals which were a part of your energy package, and (b) Russ Train's March 5 decisions and recommendations which were driven by concern over sulfuric acid from catalytic converters.

Briefly, the situation now is that:

- Your January 30 proposal for auto emission standards is no longer viable in the face of Russ Train's March 5 actions.
- If Train's position stands, automobile companies cannot commit to a 40% fuel economy goal by 1980.
- All your advisers except Russ Train and Russ Peterson believe Train's March 5 announcements should not be adopted as Administration position.

You now have two issues to decide:

1. Do you wish to submit a new legislative proposal and, if so, when and how should it be done?

   All your advisers except Train, Peterson and Weinberger believe you have no real choice but to submit a new legislative proposal because there is confusion on the Hill as to your position and there is no basis for attempting to get a new fuel economy agreement with the automakers. If you propose new legislation, there are two alternatives:

   - The normal procedure of developing the proposal, submitting and defending it.
   - A proposal by Senator Randolph that you issue a statement and have Administration witnesses present facts, but not take a position until Senate hearings are complete.

2. If you wish to propose specific standards, what should they be and what model years should they cover?

Only Train and Peterson favor adoption of Train's March 5 position as Administration position. Your other advisers are split between two options:
. Continuing 1975-76 standards through 1981.
. Adopting Canadian standards (which are slightly less rigorous than 1975-76 standards) for 1977-1981.

The balance of this memorandum and Tab A presents details.

Other background factors that you should be aware of are:

. OMB has led an extensive interagency review of the whole auto emissions matter -- which provides the basis for Tab A.
. Russ Train's decisions have been challenged by elements within EPA, by environmentalists, and by elements in industry most interested in continued use of converters. A National Academy of Sciences group may also question the decisions.
. Hard information on the sulfuric acid matter is not available.
. The Rogers Subcommittee of House Commerce is marking up an auto emissions bill.
. The Muskie Subcommittee of Senate Public Works is winding up hearings this Wednesday with an appearance by Russ Train. No other Administration witnesses are scheduled.
. Auto companies must have a final decision on 1977 model year requirements by early August. If Congress does not act, Train's decisions for 1977 will stand. These involve tightening the NOx requirement.

ISSUES FOR DECISION

The two issues listed above will be presented in the order listed, but we recommend that you not decide either of them until you have considered both.

Issue #1

All of your advisers, except Train, Peterson and Weinberger believe that a new Administration position is needed. The lack of clarity could be used by the Congress to criticize the Administration or as an excuse for not moving on legislation in time to meet the deadline facing automobile companies for 1977 models.

Normally, a new legislative proposal would be developed, following your decision on specific standards, and submitted to the Congress with a letter or statement. This normal sequence is complicated by two factors:

. The great complexity of the problem and the difficulty of conveying a clear understanding to the Congress and the public.

. The absence of hard information on the potential seriousness of the sulfuric acid problem and the sharp disagreement among experts and parties at interest over the sulfuric acid question.

In addition, Senator Randolph apparently wants public encouragement to broaden the scope of the Muskie Subcommittee hearings so that fuel economy and consumer cost issues are considered as well as air quality. Through the Public Works Committee Chief Council, the Senator has proposed that you (a) issue a statement on the importance and complexity of the issue, (b) emphasize the importance of a cooperative effort with the Congress to resolve it, (c) request hearings be opened so that Administration witnesses other than EPA can present information on all realistic alternative emission levels, and (d) not make specific recommendations until after Senate hearings are completed.

Alternatives - Issue #1

Alt A. Develop new legislative proposal; submit the proposal; backed up with a statement or fact sheet which discusses the implications of alternative emission standards; and defend.

The principal arguments for this approach are that (a) it is normal procedure, (b) it places you in a strong leadership position -- and leadership is particularly important on this complex issue, and (c) it probably would involve less time in getting to a final Congressional decision -- and the auto industry must have a decision soon.

The arguments against it are that (a) the proposal will become a target and the complexity and the lack of definitive information makes any position somewhat difficult to defend; (b) conceivably some new information or positions will come out which will undercut the proposal, and (c) discussion of other alternatives may be limited.

Alt B. Follow Randolph proposal; help assure that information is presented on all alternatives, take no position until after hearings.

The principal arguments for this approach are that (a) it would improve the quality of information available to the Congress and the public

on all alternatives, thus increasing understanding of a complex issue; (b) reduce the likelihood of Congressional attacks on the Administration's proposal and the substitution of a politically more attractive but less meritorious alternative, and (c) you could make your decisions on the basis of evidence developed by Congress as well as the Executive branch.

The principal arguments against it are that (a) the hearings will be closed with Train's appearance and no really significant new information has emerged, and (b) it may take longer to get final Congressional action.

Recommendations and Decision - Issue #1

| | | |
|---|---|---|
| Lynn, Seidman, Friedersdorf, Cannon | Alternative A. | Develop new legislation, submit facts and take a position. |
| GR7. Randolph, Train, Buchen, Peterson, Marsh | Alternative B. | Submit facts only. Decide on a legislative position after hearings. |

Issue #2. If you wish to propose specific standards, what should they be and what model years should they cover?

Auto emission standards have an impact on air quality, health effects, aesthetics, fuel economy, fuel ingredients, initial car costs, car maintenance costs and, indirectly, on automobile sales and employment in auto and related industries. Jim Lynn's memorandum at Tab A identifies and discusses the alternative emission levels and their implications in detail. That memo also presents the alternatives and recommendations for your decision (Pages 9-12 of Tab A).

If you decide to propose standards other than those recommended by Russ Train, your advisers believe it is essential that you issue a statement which (a) explains the importance and complexity of the issue to the public, and (b) outlines the rationale for your position.

A decision on the alternatives in Tab A in fact involves a number of implicit decisions:

- In view of the uncertainty over the sulfuric acid problem, should it be taken seriously?

. What consideration warrants higher weights in selecting among alternatives -- public health, meeting air quality standards, fuel economy, consumer costs, etc.?

. For what period of time should auto emission standards be set and stabilized -- three years, five years?

. Will (or should) use of the catalytic converter be suspended?

Enclosed at Tab B is a rough draft of a public statement, message or letter that could be used if you decide to take a new position. Minor changes would be needed, depending on the option you select. This draft is included in the package as an attempt to give you a basis for judging the possible extent of public understanding of the issue and your decision.

Even though energy and economic issues have taken on added significance since the Clean Air Act's rigid requirements were enacted, I believe that health continues to be the most important consideration to the public and that health should recieve highest priority consideration in making your decision.

By way of guidance in reviewing the detailed paper at Tab A, several generalizations can be made:

. Air Quality

- The auto-related pollution problem is large limited to metropolitan areas; HC, CO or NOx now or in the future exceed national ambient air quality standards only in these areas.

- Regardless of the auto emission standard selected, there will be little impact on the expected ambient air quality in 1985 for HC, CO and NOx because:

  . CO has already been reduced substantially.
  . HC has been reduced substantially from car exhausts; most HC comes from other sources.
  . NOx is now a problem in only three cities (Chicago, Los Angeles, and New York City) and will be in nine or ten by 1985, but most NOx comes from stationary sources.
  . Estimates are in dispute over sulfuric acid emissions from catalyst equipped cars, and likely build-up of sulfuric acid concentrations. But there is general agreement that catalyst equipped cars emit fifty times as much sulfuric acid as non-catalyst cars, and catalyst equipped cars equipped with an air pump to meet California HC-CO standards emit at least twice as much sulfuric acid as catalytic mufflers in use in the rest of the country.

. Health Effects

- Since the marginal differences in HC, CO & NOx are very small, regardless of the auto emission standard selected, the potential health effect is also very small.

- The health impact of sulfuric acid is expected to be serious at levels expected in 2-3 years under EPA's original projections and 4-6 years in selected areas under more optimistic projections.

- Russ Train's decision on HC-CO standards (which he has not changed, despite attacks on it) reflects the conclusion that a very small but generally known health impact from the marginally less restrictive HC-CO standards is preferable to an unknown but potentially serious health impact from sulfuric acid -- which would be increased by tightening the HC-CO standard.

. Fuel Economy

- Tighter emission standards generally result in less fuel economy.

. Consumer Costs

- The tighter the emission standards, the higher the initial car cost.

. Technological and Fuel Options

- The tighter the emission standards, the fewer the technological options for meeting standards (e.g., statutory NOx levels -- 0.4 grams per mile -- rule out diesel and stratified charge engine options.)

Recommendations and Decision (Issue #2). Data on alternatives in Tab A, with arguments for and against at Pages 8-11.

| | | HC | CO | NOx |
|---|---|---|---|---|
| | Option 1: Energy Independence Act - 1977-81 | 0.9 | 9.0 | 3.1 |
| Train, Peterson | Option 2: Train - March 5 - 1977-79 | 1.5 | 15.0 | 2.0 |
| | - 1980-81 | .9 | 9.0 | 2.0 |
| | (sulfate standard for 1979) | | | |
| Zarb, Coleman, Frizzell, Morton, Seamans, Buchen Weinberger Cannon Marsh | Option 3: Extend current stds. - 1977-81 | 1.5 | 15.0 | 3.1 |

(Options 4 and 5 on next page)

| | | | | |
|---|---|---|---|---|
| | Option 4: Canadian stds. | | | |
| Lynn, Simon, Greenspan Seidman | - 1977-81 | 2.0 | 25.0 | 3.1 |
| | Option 5: 1973-74 stds. | | | |
| | - 1977-81 | 3.0 | 28.0 | 3.1 |

TAB A

DECISION

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

MAY 16 1975

MEMORANDUM FOR: THE PRESIDENT

FROM: JAMES T. LYNN

SUBJECT: Automobile Emission Standards

Background

Pursuant to the Clean Air Act, the Administrator of EPA has established national ambient air quality standards which each region must achieve and maintain to protect health and welfare. Both stationary pollution sources and automobile emissions must be controlled to meet ambient standards.

Though ambient standards for pollutants are set by the Administrator of EPA as a regulatory action, automobile emission limitations are fixed in the Clean Air Act. Therefore, changes in automobile emission limitations require legislation.

The three automobile pollutants with statutory limitations are hydrocarbons (HC), carbon monoxide (CO), and nitrogen oxide (NOX).

The levels established for ambient standards are themselves controversial. However, the National Academy of Science has recommended their retention pending further analysis. Such analysis may lead to change (more or less strict than present). However, we are advised that it will take at least three years to improve the existing data base sufficiently to establish new ambient standards. Therefore, for purposes of present decision making we have no choice but to use the present ambient standards as criteria to determine the effectiveness of automobile emission limitations in protecting public health.

The Clean Air Act imposes increasingly more stringent automobile emission limitations. (Tab 1 shows chronology of statutory standards.) 1973-74 vehicles produce about 65 percent less HC and CO than uncontrolled vehicles. 1975 vehicles, meeting the current standards, produce 83 percent less HC and CO and 11 percent less NOX than uncontrolled (pre-1968) vehicles. The existing law, however, requires that these automobile emissions be reduced even further beginning with model year 1977 for NOX and model year 1978 for HC and CO.

In return for a voluntary agreement by automobile manufacturers to increase fuel economy 40 percent by 1980, the Administration's Energy Independence Act proposed amending the Clean Air Act to allow limitations for HC and CO which are less stringent than the law would require through 1981, but more stringent than limits currently in force. It also proposed that the NOX limit be frozen at its current level until 1981 rather than become more stringent (in 1977) as present law requires. (Tab 1 also shows Administration positions on automobile standards since 1973.)

Subsequent to submitting the Energy Independence Act to Congress, the Environmental Protection Agency held public hearings related to five-year emission levels. The hearings publicized that the catalytic converter, used to meet the HC and CO standards for 1975 and 1976 models, produces potentially harmful quantities of sulfuric acid. (See Tab 3.)

Present data are not sufficient to make specific calculations or final judgments on what sulfuric acid emission levels would be safe from a public health standpoint. However, it is known that sulfuric acid emissions can pose a significant public health risk and that automobile emission of sulfuric acid may double if the more stringent HC and CO standards proposed in the Energy Independence Act were imposed for 1977 and subsequent model years. The Administrator has, therefore, concluded and publicly announced, that the HC and CO standards should be kept at their current 1975 levels through model year 1979. Since even current emission levels present some potential health risk from converter-produced sulfuric acid, the Administrator stated that a sulfuric acid standard would be established for model year 1979 vehicles. At the same time, the Administrator called for making the NOX standard more stringent in model year 1977 than the Energy Independence Act proposed. (See Tab 1.)

Thus, the Executive Branch has two different auto emission recommendations before Congress. The Administration could avoid further conflict on this matter by not making another recommendation for automobile emission levels, and let the Congress grapple with the problem. In fact, senior staff of the Senate Public Works Committee, which has jurisdiction over the Clean Air Act, have proposed that the Administration take no position, but instead work with the Committee to delineate the feasible options. The options would be the subject of public review and Congressional hearings, after which the Administration and the Committee would formulate their respective positions on the issue.

However, both public credibility and the need of the automobile industry for resolution by August of this year to design, certify and place orders for 1977 model vehicles argue for strong leadership by the Administration. Furthermore, there is a real risk that the voluntary fuel economy approach (40 percent improvement by 1980) may be jeopardized by decisions or delays in decisions on this issue.

While the choice of emission standards must represent a balance among public health, air quality, esthetic, energy and cost considerations, the problems currently confronting the nation are different than those prevailing in 1970 when the Clean Air Act was passed. Inflation, unemployment, and the added cost and reduced availability of energy suggest the possibility of Congressional reassessment of the relative weights accorded to various factors other than measures necessary to health.

The agreement by all health scientists that sulfuric acid from the catalytic converter is either a present or potential threat to public health requires that we reconsider our previous position on automobile emission levels, which to a large extent are premised on the use of the converter at least until model year 1981. The two important questions to be addressed are:

a. Does the reduction in automobile emission standards to the levels on 1975 and subsequent model years have a significant impact on the ability of air quality regions to achieve ambient air standards? (Data presented in this memorandum indicate that the present range of options does not have a significant impact on air quality.)

b. Are automobile standards becoming stricter so quickly that technology presently identified to meet them creates other pollutants or hazards which are more dangerous, or potentially more dangerous, than the pollutants the technology is designed to reduce? (This memorandum indicates that the answer may be yes in the short term -- at least until catalytic converters can be significantly modified or abandoned in favor of new engine technology.)

## Issue

What should be the Administration recommendation to Congress on automobile emission levels for 1977-1981?

## Options

The feasible range of options is:

| | HC | CO (grams/mile) | NOX |
|---|---|---|---|
| 1. Energy Independence Act (January 1975 Recommendation) | .9 | 9.0 | 3.1 |
| 2. EPA Proposal (March 1975) | | | |
| 1977-1979 | 1.5 | 15.0 | 2.0 |
| 1980-1981 | .9 | 9.0 | 2.0 |
| 1979 Sulfuric Acid Standard (to be set later) | | | |
| 3. 1975 Standards | 1.5 | 15.0 | 3.1 |
| 4. Canadian Standards | 2.0 | 25.0 | 3.1 |
| 5. 1974 Standards | 3.0 | 28.0 | 3.1 |
| 6. Standard through 1981 if present law is not amended: | | | |
| 1977 | 1.5 | 15.0 | 2.0 |
| 1978-1981 | .41 | 3.4 | .4 |

Analysis

Over the next ten years, the quality of the nation's air with respect to regulated pollutants is, with few exceptions, virtually independent of the particular auto emission option chosen. However, the health risk from sulfuric acid is affected by the choice of option, as are auto cost and fuel economy.

The principal reason for regulating HC is to reduce the rate at which photochemical oxidants are formed, thereby aiding in the attainment of the national ambient oxidant standard. Data assembled by EPA shows that oxidant levels in 1985 for most major metropolitan areas will exceed the air quality standard even though they will decrease from present levels in all problem regions. This reduction occurs because of increased control on stationary sources which account for 75 percent of the HC emissions and the replacement of older uncontrolled cars with newer controlled vehicles. The same data shows that the magnitude of this reduction is virtually the same for all auto emission options under consideration. The range of difference in the 1975 oxidant level projected to occur because of auto emission choice varies from 0 to 2/100 of a part per million and in no air quality control region is this critical to meeting the ambient standard.

With respect to CO, 7 regions out of 26 problem regions will exceed the air quality standard in 1985. However, the data illustrate that carbon monoxide levels will decrease over 1971-1973 levels regardless of the auto emission option chosen. This decrease occurs because uncontrolled automobiles are being replaced by new, controlled vehicles. Of all the regions projected to meet the ambient CO standards in 1985, only 3 would fail to meet standards as a result of choosing the most lenient auto emission option - Denver, Puget Sound, and Portland, Oregon.

Based upon existing air quality data, there are no measurable health risks associated with the application of hydrocarbon and carbon monoxide emission standards (within the range of options presented) which are less stringent than those the President has proposed.

With respect to NOX, ambient concentration levels will increase in all 10 problem regions by 1985. This increase will, on the average, amount to 32 percent at the 3.1 auto emission level and 22 percent at the 2.0 auto emission level. However, this 10 percent difference has a very limited effect on the ability of problem areas to achieve or maintain the ambient air quality level. This is because control technology for stationary sources is not developed, and, therefore, marginal reductions in automobile emissions will be greatly exceeded by increased emissions from stationary sources.

The application of the 3.1 NOX level will not greatly increase health risks nationwide. With an ambient air quality standard of 100 ug/$m^3$ health data suggests that the level at which people having acute respiratory problems would show acute illness is 200 ug/$m^3$. (Healthy individuals would show signs of respiratory diseases at concentration levels of 400 to 450 ug/$m^3$.) Los Angeles is the only area which is expected to approach the 200 ug/$m^3$ level by 1985, and California has the lower 2.0 grams/mile level in effect as a State regulation.

Tab 2 presents more detailed analysis on the contribution of automobile emissions to total ambient conditions and identifies those regions which will exceed ambient limitations for each pollutant as a direct result of adopting less stringent standards than proposed in the Energy Independence Act. All other regions in the country will be below or above the ambient standards regardless of the option chosen. It should be noted that actual ambient air concentrations may be less than the levels indicated. For example, the air quality projections used do not reflect the reductions in vehicle miles traveled that are already occurring as a result of higher gasoline prices, retrofit programs or air quality maintenance plans.

The sulfuric acid emission problem is set forth in Tab 3. It arises because of the chemical reactions within the catalytic converter used to control auto HC and CO emissions. Use of the catalyst is the most likely technical approach to lower HC, CO and NOX emissions until new engines can be brought on market probably around 1981. With present engine technology, Option 1 requires use of a special air-injection catalyst on standard and larger cars that generates twice the amount of sulfuric acid as current catalysts.

Because reducing NOX generates additional HC and CO, the air injection catalyst is very likely to be used to meet Option 2 as well, thus defeating the purpose of EPA's recommended increase in HC and CO limitations. Use of the catalyst is optional with Options 3 through 5, but it would probably not be used extensively for Options 4 or 5.

Other possible means of controlling sulfuric acid emissions are reducing or eliminating sulfur in gasoline, but these have been rejected by EPA as impracticable for cost or other reasons. Therefore, the Administrator proposes to set a sulfate emission limit for 1979 cars and leave the means of achieving it up to industry. The problem with this approach is that we don't know yet what additional hazards may be created by the industry in solving the sulfuric acid problem. In short, history may repeat itself.

It should be emphasized that the timing and extent of the public health risk caused by auto-emitted sulfuric acid are not known. Current data indicate that it could be a problem in some areas of California as early as 1977 under worst weather conditions or in 1979 in localized areas of other States under less unfavorable circumstances - though the extent of the risk and its timing are unproven and controversial.

Secretary Weinberger has concluded that regardless of the option selected for hydrocarbon and carbon monoxide emission standards, a gradual reduction in the ambient levels of these substances will be achieved. Therefore he supports the 1975 interim standards of 1.5 and 15 for hydrocarbons and carbon monoxide respectively. In respect to nitrogen oxide, Secretary Weinberger believes that while it is prudent to minimize exposure to this substance, he believes it appropriate to select the 3.1 grams per mile option in order to minimize the emission of new compounds whose health significance has yet to be established.

The National Academy of Sciences is preparing a report which reportedly will urge the nationwide implementation of the statutory standards (Option 6) with the possible exception of a 2.0 NOx level in all States (except California) through 1981. The report concludes that instead of relaxing or holding emission standards constant to avoid a sulfuric acid risk, a program of desulfurization and reblending should be introduced to whatever extent necessary.

The Manufacturers of Emission Controls Association has released a report charging that EPA has significantly overestimated the sulfuric acid problem. The report concludes that a sulfuric acid standard is not warranted. The report also concludes that if sulfuric acid becomes a problem at a later date, then advanced catalyst technology and the desulfurization of gasoline are the best alternatives.

Several of the Federal agencies have reacted to the aforementioned arguments. EPA, FEA, DOT and DOC do not consider desulfurization or extensive reblending to be viable alternatives because of the costs, the necessary lead time, and the crude oil loss associated with their widescale implementation. EPA has also shown skepticism about the short run (1981) viability of advanced catalyst technology.

There are other anecdotal problems with the converters such as potential fire hazards, hydrogen sulfide emissions and other potentially hazardous compounds created, but none of these has been proven a significant risk.

Conclusion: The decision seems to turn on the question of relative public health risk -- yet the facts bearing on public health are not clear, and the data are inconclusive. It appears to be a trade-off between the known small hazard of increased HC, CO and NOX emissions and the unknown, but potentially large hazard of sulfuric acid emissions.

A specific comparison of options follows. The summary on cost and fuel economy impact of each is supported by information in Tabs 4 and 5. Conclusions of recent major studies of this problem are summarized in Tab 6.

The analysis of each option includes the pros and cons of the technical issues involved -- health, fuel economy, economics, and the environment. However, non-technical considerations are also important in arriving at a final decision. The major non-technical implications of each option is discussed in the subsequent section.

Option 1 (Energy Independence Act)
(.9 - HC; 9.0 - CO; 3.1 - NOX ... through 1981)

Arguments for:

- Of the options presented, probably most acceptable to environmentalists.
- Would allow continued reductions in automobile emission standards while studies of sulfuric acid continue.
- Option could be combined with other measures to minimize sulfuric acid emissions where localized problem might occur (e.g., reblending, desulfurization, and re-allocation of low sulfur gasoline). (See Tab 3.)
- Will not effect 40 percent voluntary goal since this option was the basis for voluntary program.

Arguments against:

- Will require general adoption of air-injected catalyst, which emits twice as much sulfuric acid as catalyst currently in use. (See Tab 3.)
- Will increase public health risk associated with sulfuric acid emissions.
- Will increase sticker price by $50 per vehicle. (See Tab 4.)
- May impose a 3 to 5 percent fuel economy penalty over 1975 production automobiles - 85,000 barrels of oil per day in 1980. (See Tab 5.)

Option 2 (EPA)
(1.5 - HC; 15 - CO; 2.0 - NOX ... 1977-1979)
(.9 - HC; 9.0 - CO; 2.0 - NOX ... 1980-1981)
(Sulfate standard to be set soon for 1979 model years)

Arguments for:

- Sulfate standard would press oil and auto industries to reduce emissions of sulfuric acid that would otherwise result from choosing the HC and CO limits of this option.
- Will eliminate public health risk of sulfuric acid after 1979.

Arguments against:

- Tighter NOX level for 1977 and subsequent model years may negate reductions in sulfuric acid emissions resulting from relaxing the HC and CO standards for two years. With given technology manufacturers are likely to choose the air-injected catalyst to meet this combination of limitations, particularly since more stringent HC and CO standards are proposed for 1980 and 1981 under this option. (See Tab 3.)

- Continues public health risk associated with sulfuric acid emissions until 1979.

- Increases cost by $15 to $25 per vehicle over current sticker prices. (See Tab 4.)

- Imposes a 3 to 5 percent fuel economy penalty over 1975 automobiles - 85,000 barrels of oil per day by 1980. (See Tab 5.)

Option 3 (Current standards extended through 1981)
(1.5 - HC; 15 - CO; 3.1 - NOX)

Arguments for:

- Some auto companies would reduce the use of catalysts and thus reduce emissions of sulfuric acid.

- Even with catalysts this option avoids significantly increasing the public health risks caused by sulfuric acid. (See Tab 3.)

- By definition, no cost increases occur. (See Tab 4.)

- Continued fuel economy improvements will not be interrupted. (See Tab 5.)

Arguments against:

- Notwithstanding evidence to the contrary, the popular perception will be that air quality will get worse.

- Lose much of momentum for reducing automobile emissions, and, therefore, might undermine other environmental initiatives.

. While avoiding the increase in health risk that is associated with Option 1, some risk would remain as long as converters are used.

Options 4 and 5 (Canadian Standards or 1974 standards through 1981)
(2.0 - HC; 25 - CO; 3.1 - NOX / 3.0 - HC; 28 - CO; 3.1 - NOX ... respectively)

Arguments for:

. Allows elimination of catalytic converter which some companies will drop.

. Permits decrease in emissions of sulfuric acid without forcing another short-term technological change.

. Sharply reduces public health risk caused by sulfuric acid emissions. (See Tab 3.)

. Does not significantly impact ability to achieve ambient air quality standards.

. Energy savings would occur relative to 1975 production automobiles by 1980.

. 40 percent fuel economy goal could be exceeded by 1980.

. Would result in savings in the initial cost of automobiles.

Arguments against:

. Congress, at least key committees, will strongly oppose a reversal of the long-run trend in the reduction of automobile emissions standards.

. Notwithstanding evidence to the contrary, will be attacked as crippling nation's ability to achieve ambient air standards.

. Will be violently opposed by environmentalists.

. Health scientists may oppose not lowering NOX level.

. Presents the greatest reversal from the existing standards in the Clean Air Act.

. Loss of fuel economy in the short term.

Options 4 and 5 (Sub-option)

A sub-option associated with the adoption of either the Canadian or 1974 standards would be to ban the use of the catalysts beginning with the 1977 model year.

Arguments for:

- The mandatory removal of catalysts would eliminate all health risks associated with sulfuric acid. Cars without catalysts emit only one-fiftieth (1/50th) of the amount of sulfuric acid emitted by catalyst equipped vehicles.

- It can be argued that merely easing limitations (without banning the catalysts) will not insure protection of public health since manufacturers may continue to use the catalyst anyway.

Arguments against:

- Mandatory removal at this time is premature since the extent or timing of the sulfuric acid risk is not precisely known.

- Allowing the market to operate will result in the optimal mix of converter and non-converter use on vehicles. On the one hand, the potential price effect would probably cause manufacturers to drop the catalyst if they are not necessary to meet the standards. But on larger cars, where severe fuel penalties could occur if the converter is banned, manufacturers would prefer modifying the converter over the next five years to reduce the sulfuric acid risk. In this sense, a sulfuric acid standard would allow the manufacturer much more production flexibility than a ban.

Non-Technical Considerations

Many environmental groups continue to oppose any relaxation of automobile emission standards. They argue that sulfuric acid emissions can be controlled by desulfurization, re-blending and the allocation of low-sulfur gasoline to problem regions.

A significant segment of health scientists believe that the side-effects of catalysts, such as sulfuric acid, are more injurious to public health than are the pollutants they abate (HC and CO). A large number of health scientists will support a 2.0 NOX level, although a minority might support a 3.1 level.

We have not discussed these particular options with either the auto industry or labor. It appears, however, that all of the major auto manufacturers would support any action which would reverse the downward trend in emission standards.

We expect that labor will resist any actions which will result in a significant increase in the price of automobiles.

Although several bills have been introduced in the Congress to freeze the standards at the 1975 levels which involve substantial use of catalytic converters, some members of the substantive committees in both Houses have indicated that at this time, they are not convinced that the sulfuric acid problem is severe enough to justify delaying the continued reduction of automobile emissions.

There is substantial evidence that by model year 1981 new "lean-burn" or "stratified charge" engines would permit meeting the lower (2.0) NOX standard. Thus, another variant of Options 4 and 5 would be to propose lowering the NOX standard for 1981 models. However, under no circumstances should it be made more stringent than 2.0. In fact, unless application of the current statutory NOX standard (.4 grams/mile) is delayed through at least 1990, the industry will not (and cannot) shift to a lean-burn or stratified charge engine.

Even with such a variant, however, the environmentalists would be very much opposed if either Option 4 or 5 were adopted, and chances of Congressional acceptance is quite slim.

The reason is that these options mean steps backward from the current standards for HC and CO. Even though there is now substantial evidence that the Canadian or 1974 standards do not adversely change the possibilities of attaining our clean air ambient air quality standards for HC and CO, and there is also now at least a serious question of sulfuric acid health risks from converters, claims will be made that we "sold out" to Detroit. The problem is compounded by comparison to your proposed Energy Independence Act, which was 180 degrees in the opposite direction, with respect to HC and CO, less than three months ago. Although you were apparently not apprised of the potential sulfuric acid problem in connection with those decisions -- apparently because the experts were not then as concerned as now as to possible risk -- critics will point to a reversal as showing we are in "disarray."

If either Option 4 or 5 is chosen, your commitment to reviewing the situation annually to weigh the sulfuric acid risks, technology advances, and new ways to attack the stationary source problem should be stressed.

Prior to making a final decision on this issue, I recommend that you meet with Russ Train, Rog Morton, Frank Zarb, Cap Weinberger, Bill Seidman, Jim Cannon, Russ Peterson, and myself.

Agency Positions

| | | |
|---|---|---|
| Mr. Coleman | Option 3 | |
| Mr. Frizzell (Interior) | Option 3 | |
| Mr. Morton | Option 3 | |
| Mr. Peterson | Option 2 | |
| Dr. Seamans | Option 3 | |
| Mr. Simon | Option 4 | |
| Mr. Train | Option 2 | |
| Mr. Weinberger | Option 3 | (with retrofit of existing stationary sources for NOX) |
| Mr. Zarb | Option 3 | (amend voluntary fuel economy goal to 44 percent) |
| Mr. Lynn | Option 4 | |

TAB 1

CHRONOLOGY OF AUTOMOBILE EMISSION LEVELS

The statutory standards for automobiles have become progressively more stringent since 1968. Whereas ambient standards are established by the Administrator of EPA as a regulatory action, automobile emission standards are set statutorily in the Clean Air Act. The following table shows the emission standards by model year. The Administration has made two legislative recommendations to relax the statutory standards. These are footnoted below:

| Model Year | Automobile Emission Standard (grams/mile) | | |
|---|---|---|---|
| United States (Clean Air Act) | HC | CO | NOX |
| Uncontrolled | 8.7 | 87 | 3.5 |
| 1970 | 4.1 | 34 | No standard |
| 1972 | 3.0 | 28 | No standard |
| 1973-1974 1/ | 3.0 | 28 | 3.1 |
| 1975-1976 2/ | 1.5 | 15 | 3.1 |
| 1977 3/ | 1.5 | 15 | 2.0 |
| 1978 | .4 | 3.4 | .4 |
| State of California (State law) | | | |
| 1975 | .9 | 9.0 | 2.0 |

1/ In December 1973, the Administration proposed a three year freeze of the standards at the 1975 interim levels. The Congress adopted this proposal for two years (1975 and 1976.)

2/ The Administration, in the Energy Independence Act of 1975, proposed adopting the standards for HC and CO currently in force in the State of California, but proposed keeping the NOX standard frozen at their present levels through 1981.

3/ After public hearings, Administrator Train, as a regulatory action, has retained the current HC and CO standard through model year 1977. He had no regulatory responsibility over NOX, however, and therefore, the lower NOX level reflects current law. At the same time, EPA made its recommendation for the next five years. This recommendation is Option 2.

TAB 2

# AIR QUALITY IMPACTS DUE TO LESS STRINGENT AUTOMOBILE STANDARDS

The following tables show the direction and magnitude of change in ambient concentration levels for HC, CO, and NOX which would result from adopting standards which are less stringent than those proposed in the Energy Independence Act. Three points should be noted. First, though the tables assume that the statutory standards will be in force after the 1981 model year, if any of the options were kept through model year 1990, the concentration levels for each region would change very little and the conclusions reached remain basically the same. Secondly, because the concentration levels are projected through modeling techniques marginal changes in the concentration levels, whether increases or decreases, are often within the range of statistical error. Third, the estimates of total auto pollution emitted are based on historical growth rates for vehicle miles traveled and auto fuel economy. No compensation has been assumed for the higher cost of gasoline and the higher price of standard automobiles - both of which have already affected total pollutants through reduction in vehicle miles traveled and through change in the mix of new cars on the road in favor of smaller cars which emit less pollutants per mile. The auto-caused ambient pollution levels are therefore likely to be overstated in 1981 - 1985.

## Hydrocarbons

Only 25 percent of total hydrocarbon emissions are generated by automobiles. Therefore, hydrocarbon ambient air concentrations tend to be much less sensitive than carbon monoxide to the level of vehicle emission control.

The following chart displays the limited differential impact that more stringent vehicle hydrocarbon standards would have on ambient air quality by 1985 in those areas considered to have a hydrocarbon problem.

(Table appears on following page.)

All of the twenty regions that are projected to exceed the ambient standard in 1985 will be above the standard regardless of the automobile emission level chosen. Conversely, all of the regions projected to have concentration levels below the ambient standard in 1985 at the stricter vehicle limitation are also projected to be below the ambient standard if any of the other automobile emission standards shown is chosen instead.

## Predicted Ambient Oxidant Concentration Levels
1985
(Ambient Standard = .08 ppm)*

| Region | HC Automobile Emission Standard (in grams/mile) | | | | |
|---|---|---|---|---|---|
| | Canadian Stds through 1981 | Current Stds Extended thru 1981 | EPA Recommended Standards | President's Proposal | Base 1971-73 |
| Birmingham | .12 | .12 | .11 | .11 | .22 |
| Mobile-Pensacola | .04 | .04 | .04 | .04 | .11 |
| Clark-Mohave | .13 | .12 | .12 | .12 | .22 |
| Phoenix-Tucson | .16 | .16 | .16 | .16 | .19 |
| Los Angeles | .43 | .42 | .42 | .41 | .62 |
| Sacramento Valley | .21 | .20 | .20 | .20 | .24 |
| San Diego | .20 | .20 | .20 | .19 | .30 |
| San Francisco | .23 | .23 | .23 | .23 | .30 |
| San Joaquin | .22 | .21 | .21 | .21 | .26 |
| S.E. Desert | .32 | .32 | .32 | .32 | .28 |
| Denver | .17 | .16 | .16 | .16 | .28 |
| NY-NJ-Conn. | .14 | .13 | .13 | .13 | .26 |
| Philadelphia | .10 | .10 | .10 | .10 | .20 |
| National Capitol | .26 | .26 | .25 | .25 | .38 |
| Cincinnati | .12 | .11 | .12 | .11 | .17 |
| Indianapolis | .08 | .08 | .08 | .08 | .14 |
| S. Lou.-S.E. Texas | .20 | .20 | .19 | .19 | .32 |
| Boston | .11 | .10 | .10 | .10 | .21 |
| Toledo | .07 | .07 | .07 | .07 | .14 |
| El Paso-Las Cruces | .06 | .06 | .05 | .05 | .13 |
| Genessee-Finger Lakes | .08 | .08 | .08 | .08 | .15 |
| Dayton | .13 | .12 | .12 | .12 | .18 |
| Portland, Oregon | .08 | .08 | .08 | .08 | .14 |
| S.W. Penn. | .12 | .12 | .11 | .11 | .21 |
| Austin-Waco | .07 | .07 | .07 | .07 | .16 |
| Corpus-Christi | .14 | .14 | .14 | .14 | .19 |
| Dallas-Ft. Worth | .05 | .05 | .05 | .05 | .13 |
| Houston-Galveston | .27 | .27 | .27 | .27 | .32 |
| San Antonio | .07 | .07 | .07 | .07 | .15 |
| Puget Sound | .08 | .08 | .08 | .08 | .16 |

* The projected concentration levels assume the continuance of historic growth rates for the central business districts in each region.

Carbon Monoxide

Carbon monoxide levels in the atmosphere are much more sensitive to changes in automobile emission controls that either HC or NOX. Unlike those pollutants, the growth of stationary sources over the next ten years all have little effect on CO air quality. The following table shows 1985 projected concentration levels for twenty-six regions for each of the options presented. The most important conclusion is that air quality is improving rapidly and will continue to improve until 1985 under all of the emission control options presented. This is because older uncontrolled cars are being replaced by newer controlled cars. The underlined regions are those which would exceed the ambient standard if a CO standard less stringent than proposed in the Energy Independence Act were adopted.

(Table appears on following page.)

The chart reveals several observations. First, there is only a limited difference in ambient concentration levels at any of the standards represented, but the difference is particularly small when comparing either the President's proposed vehicle standard (9.0 grams/mile), EPA's recommended standard (15 grams/mile until 1979 and 9.0 grams/mile from 1979 to 1981), or the current standard (15 grams/mile) extended until 1981. In fact by 1985, the average ambient levels for this pollutant will have been reduced about 70 percent over 1970 levels with all five options.

Secondly, the choice of option will not significantly affect any single area's ability to achieve or maintain the standard by 1985. When comparing the President's proposed standard for carbon monoxide with EPA's recommended standard or with the current standard extended through 1981, with the sole exception of Denver, those areas below the ambient standard in 1985 will be below it regardless of the automobile emission standard chosen. The adoption of the Canadian standard would mean that two additional areas (Portland, Oregon and Puget Sound) would violate the ambient standard by 1985, but only by a marginal amount.

## Predicted Ambient CO Concentration Levels
1985
(9 ppm = ambient standard)

| Region | CO Automobile Emission Standard (in PPM) | | | | |
|---|---|---|---|---|---|
| | 1974 and Canadian Stds through 1981 | Current Stds through 1981 | Recommended Standards | President's Proposal | Base 1971-73 |
| Birmingham | 6 | 5 | 5 | 5 | 18 |
| North Alaska | 11 | 11 | 11 | 11 | 35 |
| Clark-Mohave | 6 | 6 | 5 | 5 | 15 |
| Phoenix-Tucson | 16 | 14 | 14 | 13 | 42 |
| Los Angeles | 13 | 12 | 11 | 11 | 41 |
| Sacramento Valley | 7 | 6 | 6 | 6 | 22 |
| San Diego | 5 | 5 | 5 | 5 | 15 |
| San Francisco | 6 | 6 | 6 | 6 | 18 |
| San Joaquin | 4 | 3 | 3 | 3 | 13 |
| Denver | 11 | 11 | 9 | 9 | 33 |
| Hartford-New Haven | 9 | 9 | 7 | 7 | 27 |
| NY-NJ-Connecticut | 15 | 13 | 13 | 13 | 51 |
| Philadelphia | 9 | 8 | 8 | 8 | 32 |
| National Capitol | 7 | 6 | 6 | 6 | 20 |
| E. Washington N. Idaho | 7 | 7 | 6 | 6 | 18 |
| Chicago | 7 | 6 | 6 | 5 | 23 |
| Indianapolis | 5 | 4 | 4 | 4 | 15 |
| Kansas City | 6 | 5 | 5 | 5 | 15 |
| Baltimore | 7 | 7 | 7 | 7 | 18 |
| Boston | 6 | 5 | 5 | 5 | 18 |
| Minneapolis-St. Paul | 9 | 8 | 8 | 7 | 22 |
| Central New York | 5 | 4 | 4 | 4 | 15 |
| Portland, Oregon | 10 | 8 | 8 | 8 | 26 |
| S.W. Penn. | 7 | 6 | 6 | 6 | 22 |
| Wasatch Front | 15 | 13 | 13 | 13 | 41 |
| Puget Sound | 10 | 8 | 8 | 8 | 24 |

Nitrogen Oxides

Federal Government and independent scientists have all predicted that a steady increase in ambient nitrogen dioxide concentrations will occur in metropolitan areas over the next ten years. Because the technology for controlling stationary sources is very limited, the EPA feels that a more stringent automible standard will reduce that rate of increase. At the 3.1 grams/mile automobile emission limitation, a 32 percent average increase in air quality concentration is anticipated by 1985, compared to a 22 percent increase if the 2.0 grams/mile limitation were adopted.

Though the more stringent standard would have a significant effect on the overall predicted increase, the differential effect of the more stringent automobile standard on the ambient concentration levels in those areas with nitrogen dioxide problems, is much less pronounced. This is shown in the following table which displays ambient projected concentration levels in the ten problem areas for 1980 and 1985 and for both automobile emission standards.

Projected NOX Air Quality Concentrations
(Ambient standard is 100 ug/m )

| | NOX Automobile Standard (in grams/mile) | | | | |
|---|---|---|---|---|---|
| | 1980 | | 1985 | | Base |
| Region* | 3.1 g/m | 2.0 g/m | 3.1 g/m | 2.0 g/m | 1972-73 |
| Phoenix | 97 | 92 | 111 | 100 | 78 |
| Los Angeles | 173 | 163 | 194 | 173 | 148 |
| San Francisco | 93 | 88 | 102 | 92 | 82 |
| Denver | 119 | 115 | 135 | 125 | 100 |
| NY/NJ/Conn | 124 | 125 | 144 | 136 | 113 |
| Philadelphia | 107 | 104 | 121 | 117 | 89 |
| National Capital | 104 | 100 | 116 | 107 | 88 |
| Chicago | 133 | 129 | 152 | 145 | 117 |
| Baltimore | 99 | 96 | 116 | 109 | 96 |
| Wasatch Front | 121 | 116 | 137 | 124 | 100 |

* Projected concentration levels assume the continuance of historic growth rates for central business districts in each region.

By 1980, seven of the ten potential problem regions will exceed the ambient air quality standard if the 3.1 grams/mile automobile emission standard is maintained. All of those seven regions, however, would exceed the ambient standard even if the 2.0 grams/mile automobile emission level were adopted. In addition, the three potential problem regions which have projected concentration levels below the ambient standard at the 2.0 grams/mile vehicle limitation also will not exceed the ambient standard at 3.1 grams/mile.

With the exception of San Francisco, by 1985 all ten regions are predicted to have concentration levels above the ambient standard if either the 3.1 or 2.0 grams/mile limitation is placed on automobiles. San Francisco would remain below the standard if the more stringent emission limitation is adopted and, in fact, California currently has the more stringent limitation in force as a State regulation.

Two additional aspects of the above analysis should be noted. First, the projected air quality data for the ten regions assumes that the historic growth rates of industrial development and vehicle miles traveled in each metropolitan area will continue through 1985. No consideration, for example, was given for possible reductions in future vehicle miles traveled (and, therefore, reductions in pollutant emissions) which result from higher gasoline prices.

Secondly, the projected increases in nitrogen dioxide cannot be stopped without major technological innovations in stationary source control. Therefore, regardless of how stringent an automobile standard is applied, the future concentration levels in major metropolitan areas will primarily be a function of stationary source emissions. As a result, EPA's desire for a more stringent vehicle standard essentially reflects concern with total ambient concentration levels and does not address the relative degree of control exercised over stationary and mobile sources.

TAB 3

# HEALTH IMPACTS OF SULFURIC ACID EMISSIONS FROM AUTOMOBILES

Though ambient carbon monoxide and hydrocarbon concentration levels are not significantly affected by the range of automobile emission standards presented, the concentrations of sulfuric acid are affected.

Gasoline contains sulfur which, after combustion, is released as sulfur dioxide. In the process of removing other pollutants the catalytic converter changes some of the sulfur dioxide into sulfuric acid mist.

The catalyst emission system generally used to meet the 1975 interim standards produces less sulfuric acid than the system needed to meet more stringent emission standards.

Current estimates indicate that with existing automobile emission technology, the President's proposed emission standard for hydrocarbons and carbon monoxide (.9 and 9.0), will require the use of an air-injected oxidation catalyst. This catalyst results in a doubling of sulfuric acid emissions. Though there are several non-catalytic technologies which can meet the stricter emission limitations and which do not produce sulfuric acid there is little production potential for using these non-catalytic systems before the 1981 model year.

While all scientists agree that sulfuric acid is a toxic and potentially dangerous pollutant, there is still disagreement on the quantities of emissions needed to pose a health risk and on how long it would take for the build-up in concentration levels to occur. Because new data is currently under review and the state of knowledge is in flux, specific calculations or final judgments on sulfuric acid emission levels or the air quality or health impacts of the options presented cannot be made.

The following table therefore represents our best estimates of the years in which the sulfuric acid emission levels from automobiles could pose a serious threat to public health.

| Standard | Model Year 1/ in which Sulfuric Acid could pose a serious health problem: Average Meteorological Conditions | Adverse Meteorological Conditions 2/ |
|---|---|---|
| 1975 Interim Standards | 1981 | 1979 |
| 1975 California Standards | | |
| In 49 States | 1979 | 1977 |
| In California 3/ | 1978 | 1977 |

1/ The data assumes that there are no emissions of sulfates from stationary sources, and that 70 percent and 90 percent of the fleet in 1975 and 1976 respectively will utilize catalysts.

2/ Adverse meteorological conditions would occur in large metropolitan areas on an average of 6-7 days a year.

3/ The dates for reaching a critical problem are earlier in California than the remaining 49 States because California utilizes higher sulfur gasoline.

The potential health effect of sulfuric acid emissions from automobiles is complicated by two additional factors. First, data available to date do not take into account "background" emissions of sulfates from stationary sources, e.g., coal-fired generating plants. These data represent only the potential health effects of emissions from mobile sources. The extent to which sulfate emissions from stationary sources add to the potential health risk associated with sulfuric acid emissions from automobiles is not known at this time. However, most analyses are tending toward a separation of the two pollutants from a health perspective. This is primarily because the particle size of sulfates is much larger than sulfuric acid mist and is not absorbed as deeply into the respiratory system. Also the toxicity of sulfate emissions from stationary sources is generally much less than sulfuric acid and finally, emissions from stationary sources do not occur in the breathing zone as do automobile emissions.

It is generally agreed that reducing nitrogen oxide emissions will result in an increase in emission of hydrocarbons from engines. To reduce that increment, manufacturers may increase the use of the air-injected oxidation catalyst -- even to meet the less stringent HC and CO standards. If this were the case, then nearly twice as much sulfuric acid would be generated as projected for the table above. However, at this time it is not known definitely whether manufacturers could achieve reductions of the HC increment through the use of engine modifications instead of the air-injected catalysts.

## Short Term Actions Available for Localized Sulfuric Acid Problems

As noted in the section on health effects, under certain adverse meteorological conditions localized sulfuric acid problems could occur. There are two short-term actions available to offset this possibility. While feasible, both have some drawbacks as well.

1. Gasoline Blending - catalyst equipped vehicles could be provided with lead-free and low-sulfur fuel which, if allocated to certain problem areas, would reduce emissions of sulfuric acid. This would, however, impose an allocation problem on the industry. Refiners have also indicated sufficient quantities would not be available to meet widespread problems beyond 1977 or 1978.

2. Desulfurization of oil - though technically possible at this time, the desulfurization of oil would require capital investment at a time when refiners are attempting to expand domestic capacity. It would also require an increase in crude oil consumption due to additional refining and therefore, some increase in the price of gasoline. If desulfurization were instituted nationwide, capital cost would range between $2 and $4 billion, crude oil consumption would increase .5 percent and the price of gasoline would increase by 1 to 2 cents per gallon.

TAB 4

# ECONOMIC IMPACT OF AUTOMOBILE OPTIONS

The options presented will impose varying cost burdens on the consumer. Also, separate costs are associated with actions on NOX and actions on HC and CO.

## NOX

Consumers will face sticker price and operating cost increases over the 1975 model vehicles if EPA's recommended 2.0 grams/mile limitation is imposed. Estimates range from $10-25 for front-end costs per vehicle and from $0-15 in operating costs over 50,000 miles. However, not included are the additional costs of increased fuel consumption associated with this lower standard, which rough estimates place at $1.7 million per day.

## HC and CO

The costs of maintaining the more stringent hydrocarbon and carbon monoxide standards (.9 and 9.0) as proposed by the President in the Energy Independence Act is estimated to be $50 per vehicle over 1975 automobiles. This would represent the additional costs of using the air-injected oxidation catalyst. However, not included are estimates of operating costs which would result from the increased consumption of gasoline that maintaining this option implies. Rough estimates place this cost at $1.7 million per day.

TAB 5

ENERGY IMPACTS OF OPTIONS

The options presented will have differential fuel economy impacts and therefore different impacts on manufacturers' ability to meet the 40 percent fuel economy goal. EPA disagrees with the fuel economy penalties here. The agency firmly believes that there are no technological barriers to reducing emission standards without a fuel penalty. However, a recent Columbia University study supports an even larger NOX penalty than the one used in this analysis.

A. Impact on 40 Percent Fuel Economy Goal

| Options | % Over 1974 | Shortfall (-) or excess (+) Over President's Goal |
|---|---|---|
| Energy Independence Act | 40% | --- |
| EPA Proposal | 36% | - 4% |
| 1975 Stds. thru 1981 | 46% | + 6% |
| Canadian and 1974 Stds. thru 1981 | 50% | +10% |

B. Energy Impacts*

| Options | Barrels per day (in 1980) |
|---|---|
| Energy Independence Act | 85,000 (loss) |
| EPA Proposal | 137,000 (loss) |
| 1975 Stds. thru 1981 | 0 |
| Canadian and 1974 Stds. thru 1981 | 27,000 (gain) |

* Base is 1975 model year automobiles meeting 1975 interim emission standards.

TAB 6

# SUMMARY OF REPORTS ON AUTOMOBILE EMISSION STANDARDS

Two noteworthy reports have been published which address an entire range of automobile options and their impacts on air quality, health, energy and costs.

## National Academy of Sciences

At the request of the Committee on Public Works, the National Academy of Sciences submitted a report entitled Air Quality and Automobile Emission Control (August, 1973).

## Air Quality

The NAS concluded that:

a. Federal ambient air quality standards for carbon monoxide (CO) could be met by 1990 even with some relaxation of the present automobile emission standards - but only if heavy vehicle and stationary sources were reduced to the same degree as emissions from automobiles.

b. The statutory emission standard of .4 grams for NOX may be more stringent than needed but only if stationary emissions are reduced to the same extent as automobile emissions.

c. The impact of HC emissions from automobiles varies greatly among geographical regions. In general, however, the statutory standard of .41 grams/mile is not sufficiently stringent to assure compliance with the ambient air quality standard for oxidant. Present analyses, therefore, are inadequate to justify changes in the Federal motor vehicle emission standard for hydrocarbons at this time.

## Role of Auto Emissions in Total Health Problem

The NAS concluded that between one-tenth and one-fourth of the air pollution hazard is a result of automobile emissions. For the whole U.S. population, effects of this magnitude might represent as many as 4,000 deaths and 4 million illness restricted days per year.

Columbia University

In a more recent study funded by the NSF, Columbia University has publicized The Automobile and the Regulation of Its Impact on the Environment. This report has concluded that:

a. The ultimate success of a strategy placing major reliance on emission controls in new vehicles depends on the availability of a durable and maintainable control technology. The development of such a technology would be best promoted by delaying the 1975/1976 standards for HC and CO until the 1980 model year.

b. The availability of control technology limits the degree of NOX emission reduction which can be achieved. Because of errors in ambient NOX concentration measurements, the eventual reductions in automobile NOX emissions required to meet ambient air quality standards are still in question.

c. While recognizing a fuel economy penalty of 5 percent, it is recommended that an emission level of 2.0 grams/mile for NOX be adopted for at least five years.

d. To induce advanced technologies, it is recommended that a schedule for NOX emission standards for the next ten years be developed and promulgated.

TAB B

The Congress is now engaged in a review of automobile pollution control requirements of the Clean Air Act. The decisions that must be made on these requirements will affect in a major way the interest of most all Americans -- those who own and drive cars and those who do not. The decision is important to all Americans because it will have an impact on our Nation's ability to achieve objectives involving public health, energy, consumer prices, unemployment, and the strength of our economy, as well as the objective of improved air quality. The decision must reflect the best possible choice as to priorities and balance among the competing national objectives that are involved.

On January 30, 1975, I recommended that Congress establish auto emission standards that would remain stable for 1977 through 1981 model year cars. At the same time, my Administration obtained the commitment of the nation's major auto manufacturers to make a major effort to increase fuel economy for the new car fleet in 1980 by 40% over 1974 levels.

Subsequent to those developments, the EPA conducted extensive hearings relating to auto emission requirements. On March 5, 1975, following those hearings, EPA Administrator Train announced conclusions and recommendations with respect to 1977-1981 standards which were different from the standards I had proposed. The Administrator indicated that his decisions and recommendations were heavily affected by his

conclusion -- which had the full support of the Secretary of Health, Education and Welfare -- that sulfuric acid mist emitted from cars equipped with catalytic converters may, within a few years, cause a potentially serious health problem. This new conclusion called sharply into question the wisdom of tightening auto emission standards as I had proposed on January 30. These tighter standards would have required that many automobiles be equipped with catalytic converters with air injection pumps. Automobile catalysts equipped with air pumps emit more than twice as much sulfuric acid as those without air pumps.

Following the EPA action, I directed that a thorough interagency review be conducted of the auto emissions control problem and of alternative emission control requirements, so as to identify for each set of requirements the implications for air quality, health effects, fuel economy and consumer costs. Despite some uncertainties, principally with respect to health effects that will result from sulfuric acid emitted by catalytic converters, I believe the information now available provides the basis for prompt decision on auto emission standards.

Before presenting my specific recommendations, I believe it is important to provide a brief summary of (a) the background and status of current statutory requirements, (b) the alternatives that have been evaluated within the Executive Branch, and (c) the principle factors that should be taken

into account in deciding the auto emission standards issue. This brief review of the matter should make it clear that this is a most complex public policy decision that requires weighing and balancing a broad array of potential benefits, risks and costs for the Nation.

Background

The Clean Air Act amendments of 1970 set very rigid standards and deadlines for the reduction of hydrocarbons(HC), carbonmonoxide(CO) and oxides of nitrogen(NOX) from automobiles. It proved impossible to meet the original requirements and changes have been made. The current statutory requirements are:

| | HC | CO | NOX |
|---|---|---|---|
| 1977 | 1.5 | 15.0 | 2.0 |
| 1978 and future years | .41 | 3.4 | .4 |

There is broad agreement that the current statutory standards applicable to 1978 would be extremely difficult and perhaps impossible to meet, would involve increased costs and decreased mileage, and will have to be changed. These requirements as well as the 1977 requirements are now being subjected to Cogressional review.

Alternatives

The review by Executive Branch agencies considered the implications of a range of alternative automobile emission requirements which might be applied to 1977 through 1981 model automobiles. Specifically, the following standards

applicable to hydrocarbons(HC), carbonmonoxide(CO) and oxides of nitrogen(NOX) emissions have been considered:

| | Emissions in grams per mile | | |
|---|---|---|---|
| | HC | CO | NOX |
| My January 30 recommendations covering 1977-81 model years | 0.9 | 9.0 | 3.1 |
| Mr. Train's March 5 conclusions | | | |
| - for 1977-79 models | 1.5 | 15.0 | 2.0 |
| - for 1980-81 models | .9 | 9.0 | 2.0 |
| Continue standards applicable to 1975-75 models for 1977-81 | 1.5 | 15.0 | 3.1 |
| Adopt Canadian 1975-76 standards for 1977-81 models | 2.0 | 25.0 | 3.1 |
| Reimpose standards applicable to 1973-74 models for 1977-81 | 3.0 | 28.0 | 3.1 |

Important Factors

There are a number of significant factors that need to be considered in evaluating the automobile emission problem:

1. Controls on auto emissions have produced significant benefits and will continue to do so in those areas that have an auto-related pollution problem. Lower pollutant levels in these areas can reduce adverse health effects and reduce photochemical oxidants (smog) which is aesthetically unpleasant and a serious respiratory irritant.

2. Automobile related pollutants are a problem in a number of metropolitan areas but are not a problem in many parts of the country. Auto emission standards, however,

have been applied nationwide (except in California which may have more stringent standards) and the added costs for pollution control equipment, maintenance, and lower gasoline mileage are paid by drivers in all areas of the country -- including those areas that do not have a problem.

3. Controlling automobile pollutants is a technologically complex problem as illustrated by the fact that steps taken to control some pollutants from internal combustion engines have had the effect of increasing other pollutants or creating new ones. For example, controls to reduce hydrocarbons(HC) tend to increase emissions of oxides of nitrogen(NOX) -- and the reverse is also true. The most recent example is the potentially serious problem of sulfuric acid mist from cars equipped with catalytic converters installed to meet 1975-76 hydrocarbon(HC) and carbonmonoxide(CO) standards. Also, experts now indicate that reduction of NOX standards below the current standards (3.1 grams per mile) could require the use of larger catalysts or catalysts with air pumps which increase sulfuric acid emissions.

4. Considerable progress has been made on automobile emissions since the 1970 Clean Air Act Amendments were passed. In the case of HC and CO, the standards applied to 1973-74 model cars reflect a 65% reduction in emission from

pre-control levels (and 1975-76 standards reflect an 83 percent reduction)*. In the case of NOX, EPA determined subsequent to the 1970 amendments that earlier assessments of NOX concentrations in air were in error and that a 90 percent reduction in NOX emissions was not necessary to meet ambient air quality standards. However, NOX emissions have been reduced by 12 percent from uncontrolled levels and work is underway to find more effective ways of controlling NOX emissions from stationary sources. Stationary sources contribute more NOX than automobiles in most of the 10 metropolitan areas that could have concentrations exceeding the national standard over the next 10 years.

5. Tighter or looser auto emission standards for HC, CO or NOX within the range of alternatives available make little difference in the air quality in the areas that have an auto-related pollution problem. This little known fact is true because: (a) of progress already made in controlling emissions or (b) automobiles are not the principal source of the pollutant involved. The contribution of HC, CO and NOX from automobiles will continue to decline as more and more cars meeting existing or past standards replace older models in the Nation's fleet of automobiles. In the case of carbonmonoxide, concentrations in metropolitan areas around the country have

* Substitute parenthetic phrase if decision is to maintain current (1975-76) standards.

been declining steadily. Hydrocarbon emissions (which are an ingredient of photochemical oxidants or smog) have been declining but less rapidly than carbonmonoxide because automobile exhaust emissions account for only about 25 percent of the hydrocarbons that comes from other than natural sources. In the case of NOX, three metropolitan areas in the country experience concentrations at this time which exceed national air quality standards and this number may increase to 9 or 10 areas in the next 10 years. The growth would be due primarily to stationary sources. Tightening standards for automobiles below the current levels could produce slightly lower concentrations in the future, but such tightening would not assure meeting national ambient air quality standards in the 9 or 10 metropolitan areas expected to have a problem. As indicated above, tightening of HC, CO or NOX standards is expected to increase the emission of sufuric acid.

In addition, a reduction in vehicle miles traveled due to energy conservation actions or growth in vehicle miles traveled that is less than EPA has projected will further minimize projected auto-related pollutant problems.

6. Experts believe there is little or no health impact that can be attributed with the small margin of change in ambient air quality that would result from tighter or looser

HC, CO or NOX auto emission standards within the range being discussed. This is the case principally because tightening standards beyond 1973-74 levels (1975-76 levels*) will have very little impact on concentrations of these pollutants in the areas that have an auto-related pollution problem.

7. There is uncertainty concerning the health impact of sufuric acid mist emissions from catalyst equipped cars because of insufficient data and divergent estimates of the importance of the problem among the various interests concerned. The seriousness of the sulfuric acid emissions problem will depend upon (a) the amount of emissions from catalyst equipped cars, (b) the extent to which concentrations of surfuric acid buildup in areas that impact the public, and (c) whether there is a threshold below which sulfuric acid is not injurious to health. While there is uncertainty, the Administrator of EPA and the Secretary of HEW have made it clear to me that they believe there is the potential for a significant health risk that cannot be dismissed with information now available. This assessment led the Administrator of EPA to conclude on March 5 that HC and CO standards should not be tightened at this time because tighter standards would, with technology now available, force use of catalysts and air pumps on many cars nationwide in 1977. Because of the potential risk, the Administrator also announced that he is proceeding to set an emission standard covering sufuric acid applicable to 1979 model cars.

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* Substitute parenthetic phrase if decision is to maintain current (1975-76) standards.

8. Auto emission standards have had a significant impact on miles per gallon of gasoline and on our Nation's total petroleum demands and reliance on foreign sources.

a. Emission controls applied to automobiles between the years 1968 and 1974 caused a very significant reduction in miles per gallon of gasoline. It is true, however, that the use of catalytic converters on 1975 cars manufactured to meet 49-State emission standards permitted engine adjustments which helped regain some lost gasoline mileage. The higher levels of pollution created in the retuned engines were captured and changed chemically in the catalytic converters. Cars which must meet the tighter emission standards applied in California generally get poorer gasoline mileage than similar model cars produced for other states.

b. An additional impact on petroleum demands comes from the need for unleaded gasoline for catalyst-equipped cars. The production of unleaded gasoline required changes in refinery processes which increased the qunantity of crude oil required to produce each gallon of gasoline at the required octane level.

c. While there is some disagreement among Executive Branch agencies, the best information now available indicates that for the next few years emission standards tighter than current levels will involve significant gasoline mileage

penalties. Specifically, with technology now available, there would be a fuel economy penalty associated with tightening the NOX standard from 3.1 to 2.0 grams per mile and there would be an additional penalty associated with tighter HC and CO standards.

d. There is also general agreement that technology is available to permit increases in fuel economy over the next few years compared to 1974 levels if 1975-76 standards are maintained through 1971. Even greater fuel economy improvements could be achieved within a few years if either the 1973-74 standards were reestablished or Canadian standards were adopted.

9. In addition to poorer fuel economy, increased consumer costs resulted from higher initial car costs for emission control equipment and associated maintenance costs. Tightening of HC, CO or NOX standards from 1975-76 levels would involve additional consumer costs. Actions to reduce sulfuric acid emissions from catalyst equipped cars would involve large additional costs.

10. Less stringent auto emission within the range now available would open up technological options for meeting standards that would not be available with tighter standards (e.g., the so-called stratified charge and diesel engines, "lean-burn" technologies and other internal combustion engine modifications). These technological options will permit fuel economy improvements that are not possible with tighter standards.

11. The basic philosophy and approach that has been used to bring about auto emission controls needs to be reconsidered in light of current conditions.

a. We should be clear about the philosophy that has been applied in the Clean Air Act auto emissions standards and the rationale behind that philosophy. Briefly, the philosophy has been that automobile companies do not have market incentives to develop technology to reduce auto emissions and would not develop such technology unless forced to do so by progressively rigid standards backed up by law and regulation. It would be difficult to contend that progress achieved so far in controlling auto emissions would have been achieved if this approach had not been used. On the other hand, hindsight suggests we may now be faced with a potentially serious sulfuric acid problem which might not have occurred had more time been allowed to develop and assess technology before it was put into use. The wisdom of continuing a rapid "technology forcing" approach is open to question.

b. Auto emission standards have been changed frequently in recent years, allowing little time for developing and assessing alternative technologies. As standards have become more stringent, the technological changes required

have become more extensive and more sophisticated. More time is required to develop and assess improved technology and bring it to a stage where it can be used on production line cars. These factors, the current economic status of the automobile industry, and the demands being placed on the industry simultaneously to meet safety standards and to improve fuel economy need to be kept in mind when the Congress considers the question of whether standards should be held stable for more years than has been the case in the recent past.

12. Prompt Congressional action is needed on auto emission standards. This matter warrants thorough discussion by the Congress and the public because of the far reaching implications. The matter also requires an early decision by the Congress. Specifically, the Administrator of EPA adivses me that in order to meet deadlines for emission testing and certification of 1977 model cars, the automobile industry will need to know 1977 emission standards by early August 1975 so that there will be time to complete design and engineering, build prototypes, complete emissions testing such as 50,000 mile endurance tests, and finally to produce new cars in adequate quantity to meet demand from the American public.

13. The broader economic implications of the auto emission decision must also be kept in mind. There undoubtedly has been some contribution to inflationary and recessionary pressures in the economy from the increased consumer costs, and poorer gasoline mileage (and greater reliance on foreign oil) resulting from emission control requirements. Inflationary and recessionary conditions have both contributed to and resulted from sharply lower sales and employment in the auto industry. Of course, any costs associated with auto emission controls must be balanced against the health, aesthetic and economic benefits that are gained from improved air quality.

14. Actions to reduce auto emissions must take into account other sources of the same pollutants. In cases where stationary sources of the same pollutants are significant contributors to a problem in the metropolitan areas of concern, it may be far more cost effective to place greater reliance on reducing pollution from stationary sources. The problem of other sources is complicated by a growing body of opinion that natural sources of pollutants -- which cannot be controlled -- may be sufficiently important in some areas to prevent attaining

national air quality standards regardless of what is done to control man-made sources.

Legislative Recommendations

Based upon the information and data that have been developed during the Executive Branch review of the auto emissions issue, I have today recommended to the Congress that the Clean Air Act be amended to set standards of _____grams per mile for HC, ____for CO, and _____ for NOX. I have further recommended that these standards be kept in force for _____years. These standards would be equivalent to those in effect for _____model year cars. My conclusions are based on an evaluation of air quality, health, consumer cost, fuel economy, and other energy and economic considerations.

First, the principal reason for my recommendation of less stringent HC and CO requirements than I recommended earlier is the unknown but potentially serious health effects associated with sulfuric acid emitted from catalyst equipped vehicles, and the fact that this problem is exacerbated by the use of air pumps which would be needed on most cars to meet those standards. In the absence of better data and greater agreement among experts, the potentially serious health effects must take precedence over the known but very small potential health effect

associated with the slight changes in HC and CO concentrations if HC and CO standards tighter than I have proposed were established.

Second, I have concluded that tightening of the NOX standard from 3.1 to 2.0 grams per mile would be undesirable because the probable fuel economy loss and the probable need to use air injected catalyst systems to meet the 2.0 standard, which would increase sulfuric acid emissions. These potential costs are not balanced by the benefits of the very small change in ambient air quality and the imperceptible impact on health that could result from the tighter standards.

Third, the marginal benefits in a few metropolitan areas which might result from tighter nationwide standards are very small. Based upon the information now available, those benefits do not appear to justify the additional consumer and energy requirements costs, that would be imposed nationwide. Furthermore, the standards I have proposed preserve technological approaches to pollution control that are cheaper in terms of fuel requirements and consumer costs which would not be available under tighter standards.

Fourth, I have proposed that the standards remain constant for _____years so that the industry is not distracted unnecessarily from efforts to improve safety and fuel economy. A pause for this period will not have significant adverse effects on our progress in improving air quality. It will also provide time for industry and the Government to help avoid costly errors and increase the chances of meeting fuel economy, safety and consumer cost objectives.

Administrative Actions

Because of the far reaching impact that automobile emission standards can have on all of the factors I have discussed, I feel very strongly that we should have known a great deal more about their impact before standards were set.

I believe the Nation should not be subjected to far reaching Federal actions such as establishment of auto emission standards which required the catalyst without far better information than was available before this action was taken.

Current law requires that an Environmental Impact Statement be prepared showing the expected environmental impact of major Federal actions significantly affecting the quality of the human environment. Somewhat ironically,

that requirement has not applied to Federal pollution control actions, such as the setting of auto emission standards which led to the catalyst technology. If such a requirement had been followed we might have known in advance of the health, environmental and economic implications of auto emission standards which led to the installation of catalytic converters.

Because of my concern over the potentially unforeseen results of Federal actions, I have directed previously that inflationary impact statements be prepared on significant Federal actions affecting the economy. I intend to continue pursuing that basic approach to Federal decision making.