

December 19, 1969

MEMORANDUM FOR

John Ehrlichman

*White House
JF Ennis*

Subject: Recommendation to pursue non-conventional vehicle development

The attached paper briefly outlines the rationale for a Federally supported program leading to development of technological alternatives to the internal combustion engine.

While we cannot be certain that the proposed program will be successful, it seems to me well worth supporting. If it succeeds, the gains to society will be enormous. If we eventually need such a vehicle, the costs of not having one will be tremendous. I recommend that funds for this program be included in the budget, and the program be referred to in the State of the Union Address.

LAD
Lee A. DuBridge
Science Adviser

Attachment

cc:

OST File & Chron
LAD File & Chron
JLB File & Chron
Dr. Gouse

JLBuckley:ew

RATIONALE FOR FEDERAL SUPPORT OF A NON-CONVENTIONAL
VEHICLE DEVELOPMENT PROGRAM

THE PROBLEM:

To achieve the quality of air the people of this nation want, it will be necessary to have extremely low emissions from automobiles. There is a small but finite probability that the internal combustion engine will not be able to meet these low standards. Present efforts to develop alternative technologies are inadequate. Public interest demands that a viable alternative be available.

WILL THE AUTOMOTIVE INDUSTRY MEET THIS NEED? IF NOT,
WHY NOT? :

The industry has an enormous investment in the internal combustion engine. They have worked vigorously on gas turbines and will market them in trucks and buses. Unless there is an unexpected breakthrough in high temperature materials technology, however, turbines will be too expensive for passenger cars. The industry has made a policy decision that other technologies are not feasible.

The auto industry is working hard on reducing pollution from the internal combustion engine and apparently believes that the public will find their best efforts acceptable. Even if a satisfactory internal combustion engine is developed, high expenditures for levels of maintenance, throughout the life of the car, and inspection to assure compliance will be necessary to assure satisfactory performance of this inherently polluting propulsion system. Contrary to the industry's claims, some attractive alternate technologies would not cause large dislocation in our economic system.

There is no incentive for the auto industry to pursue other technologies vigorously. There is no real competitor, and at this time they therefore control the level of air quality achievable.

WHAT COULD THE FEDERAL GOVERNMENT DO? :

Objective -

Because projected emission requirements for automotive vehicles may not be economically met with the technologies now pursued by the

industry, we must ensure that adequate alternate technologies are acquired by

- Federally supporting research and development.
- Additional work by the industry in response to Federal intervention.
- Undertaking of speculative research by the private sector outside of automotive industry.

Assumptions -

Informed judgments indicate that there is a reasonable chance that the internal combustion engine cannot be made clean enough to meet projected emission requirements.

There is a reasonable chance that some unconventional propulsion systems will be acceptable.

The Plan -

A flexible long-term plan could be announced; its major features would permit

- Staged contract development of attractive technologies not being pursued by NASA, DOD, or the automotive industry.
- Funding of large development through prototype programs if attractive proposals are forthcoming.
- Purchase, at a substantial premium, for test and evaluation, completed prototypes that meet projected emission and performance standards.
- Termination of any technological path as soon as it is clear that objectives cannot be met.
- Termination or shift of programs as soon as adequate alternate is developed.

IS THE PLAN WORKABLE? :

Firms outside of the industry can be expected to participate in the Federal program. At present these firms will not commit risk capital because of the difficulty of entering the vehicle market. If the Federal government shows itself to be clearly behind the development of low pollution vehicles, the possibility for these firms to recover their investment capital is greatly enhanced to break into the market, either by selling technology to the industry or independently marketing automotive vehicles. In any case these firms would make a profit on any contract on research and development with the Government.

SHOULD THE FEDERAL GOVERNMENT INVEST ITS "RISK CAPITAL" IN THIS VENTURE? :

If in 1980 it becomes clear that the ICE cannot be sufficiently controlled, the public health consequences could be disasterous. Work on unconventional power sources now will either give us an early warning that if the ICE is not controlled more drastic measures, such as the rationing of cars, must be instituted, or else give us a feasible alternative.

If technology is available, growing public opinion will make imposition of 1980 air quality standards politically feasible.

If the President does not take adequate steps to solve the automotive air pollution problem he will be severely criticized. Even if unconventional power sources are found to be unfeasible, the President will probably be praised for his efforts.