

New Technology

To: Ed David
Don Rice

From: W.M. Magruder

Subject: New Technology Opportunities - Advisory Group

Ref: Memo, same subject dated 12 August 1971 from David & Rice to
Ehrlichman, Shultz, Flanigan and Peterson

The subject memorandum suggests an Advisory Group composed of outside government people. I would like to suggest the following breakdown of disciplines and potential candidates.

1. Industry

Simon Ramo, Chairman of the Board, Thompson Ramo Wooldridge Inc.
1 Space Park, Redondo Beach, California 90278

Edwin Land, President, Polaroid Corporation, Cambridge, Mass 02139

Patrick E. Haggerty, Chairman of the Board, Texas Instrument, Dallas,
Texas 75222

Paul Chenea, Vice President, Research Laboratories, General Motors,
Mound Road, 12 Mile Road, Warren, Michigan 48090

Herman H. Goldstine, Research Division, IBM, P.O. 218, Yorktown Heights,
New York 10598

Myron Tribus, Senior Vice President & General Manager of BPG/RNE,
Business Products Division, Xerox Corporation, Rochester, New York
14644

Barney Oliver, Vice President, RND, 1501 Page Mill Road, Palo Alto, Calif. 94304

Lloyd Kelly, Link Division, Singer Company, 30 Rockefeller Plaza, N.Y. 10020

Elmer Engstrom, David Sarnoff Research Center, RCA, Princeton, N.J. 08540

Donald P. Kircher, Pres., Singer Company, 30 Rockefeller Plaza, N.Y. 10020

2. Financial and Management

Ted Walkowitz, Adviser to Rockefeller Foundation, 30 Rockefeller Plaza, N.Y.

Emilio Q. Daddario, Senior Vice President, G&W Precision Engineering Co.,
Manchester, Connecticut

Eugene Black, American Express, 65 Broadway, N. Y. N. Y.

Stanley de J. Osborne, General Partner, Lazard, Freres, & Co., 44 Wall St., N. Y.

Gen. B.A. Schriever (USAF, Ret.) Schriever-McKee Associates, Wash., DC

H. Geneen, Board Chairman, ITT, 320 Park Ave., New York, N. Y.

Will Duke, Board Chairman, Whittaker Company

George Ball, Lehman Brothers, 1 Williams St., New York, 10004

3. Civilian Technology

E. G. Fubini, Fubini Associates, Alexandria, Va.
Milton Shaw, Carnegie Tech
H. Holloman, MIT
Wm. Bollay, University of California, Santa Barbara, Calif.
Arnold Beckman, Beckman Instruments
Dean Watkins of Watkins & Johnson
Mr. Alidrandi, Whittaker, Co., President

4. Health Care - Biology

I. London, Harvard
Nello Pace, University of California
M. D. Hollis, Pan American Health Organization
D. Proctor Harvey, Cardiology Department, Georgetown Hospital, Wash DC
James Hogness, Board of Medicine, National Academy of Science
Kerr White, John Hopkins University, Baltimore, Md.
Joshua Lederberg, Professor Genetics, Stanford School of Medicine, Calif.
John Cantlow, Michigan State U.
Emil Micnk, University of Calif.
Nathan Kaplome, Univ of Calif. at San Diego
____ Spiegelman, Columbia University
Max Wintrobe, University of Utah

5. Waste Management

E. J. Cleary, Ohio River Valley Water Sanitation Commission
A. Wolmen, John Hopkins University
C. F. Kelly, University of California, Berkeley

6. Pollution Control

Lester Lees, Calif Institute of Technology, Pasadena, Calif.
Harold Gershenowitz, Shell Division
Aire Hoagan-Smith, Calif, Institute of Technology, Pasadena, Calif.

7. Energy

M. Benedict, MIT
P. Spurn, A. E. Puller
Joe Miller, President, National Electrical Manufacturing Assn. 155 E. 44th, NYC

8. Agriculture

Norman Borlong, Rockefeller Foundation (Mexico)
Theodore Schultz, Univ. of Chicago
George Hascran, Rockefeller Univ.
Sterling Hendricks, USDA (Retired)

9. Natural Resources and Materials

Hans H. Lonsberg, Resources for the future
M. Cohen, MIT
R. J. Jaffee, Battelle

10. Transportation

S. Herwala, Westinghouse
H. Davis, Univ of Calif., Richmond Calif Transportation Research Center
Wayne Hoffman, Flying Tiger, Exec V.P., (Packard background)
Alan Boyd, Illinois Centreal Railroad, President
Bunky Knudson, White Motor Co., Pres.

11. Aerospace

W. Hawkins, V.P. Research, Lockheed Aircraft Corp., 1025 Conn. Ave., Wash I
C.L. Johnson, V.P. Engineering, Lockheed Aircraft Corp., Burbank, Calif.
H. Paige, General Dynamics
Ed Wells, The Boeing Company, Seattle, Washington
A. Hall, Martin Company
M. Baron T. George, AVCO, Mass.

12. Economics

Richard Nelson, Dept. of Economics, Yale Univ., New Haven, Conn.
Theodore Schultz, Univ of Chicago
Burton Klein, Calif. Inst of Tech. Pasadena, Calif.

13. Social Science

Pat Moynihan, Prof of Education & Urban Policy, Harvard Univ.
Otis Dudley Duncan, Pop. Studies Center, Univ of Michigan
Robert K. Merton, Dept. of Sociology, Columbia U.
Kingsley Davis, Univ. of Calif, Berkeley
Ken Boulding, Univ of Colo.

14. Academic

Hugh Heffner, Dept of Applied Physics, Stanford U., Calif.
Fred Seitz, Rockefeller Univ, N.Y.
E. R. Gilliland, mIT
D.C. Drucker, Illinois U.

15. Labor and Manpower

Nathanial Goldfinger, Director, Dept. of Research, AFL/CIO
Dall Wolfle, Univ of Wash.
Phillip Hauser, Dept of Sociology, Columbia Univ.

16. Industrial Incentives

J. H. Dessauer, Xerox Corp.
E. L. Ginzton, Various Associates
D. Sinclair, General Radio

UNITED STATES GOVERNMENT

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY*Memorandum*

DATE:

In reply
refer to:SUBJECT: New Technology Opportunities Review of
Anti-Trust and Patent Law Practices

FROM : W. M. Magruder

TO : Attached List of Addresses (Attachment A)

Re: Domestic Council Study Memorandum #12
Anti-Trust Policy: dated 19 Feb 1971
Ehrlichman to Distribution

It is requested that convene the working group shown in Attachment A, to accomplish the charter shown in Attachment B in order to seek out sensible new technology opportunities to generate a more vigorous pace of innovation in U. S. industry, to increase industrial productivity, to improve the U. S. competitive international position and to perhaps orient anti-trust and patent policies to early and effective action aimed at urgent national needs and/or economic opportunities. A tentative schedule of activities is shown in Attachment E, which is meant to allow adequate time to consider at least the potential areas of concentration shown in Attachment C, and to contact the potential sources of renovated ideas shown in Attachment D. An outline of the review material to be generated is shown in Attachment F.

W. M. Magruder

New Technology OpportunitiesAnti-Trust & Patent Law Task Force:Members

<u>Name</u>	<u>Dept.</u>	<u>Background</u>
Lew Engman	W. H.	Legal
Bruce B. Wilson	Justice	Legal
Tony Chase	SBA	Business
Don Rice	OMB	System Analysis
Hugh Loweth	OMB	System Analysis
Jim Lynn	DOC	General
? - John Ehrlichman	Dom. Council	Legal
" Dick McLaren	Justice	Legal
? - Peter Flanigan	W. H.	Banking
Jim Loken	W. H.	Legal
Peter Peterson	W. H.	Industry
✓ Bud Krogh	W. H.	Legal
Sam Pierce	Treasury	Legal
✓ Dick Nordahl	Justice	Legal
Eb Rechtin	DOD(DDR:E)	Technical
Herb Stein	CEA	Economics
John Dean	W. H.	Legal
Miles Kirkpatrick *	Fed. Trade Comm.	Business - Legal

* Consulting basis as required by chairman

New Technology Opportunities

Anti-Trust & Patent Law Task Force: Charter

- Purpose: 1) Examine existing administration anti-trust and patent law policy in all of its aspects, including the conduct of American "Persons" abroad, as a foundation for further policy determination.
- 2) To specifically examine the anti-trust and patent law policy as it relates to the New Technology Opportunities Program designed to generate:
- a) A more vigorous pace of innovations in civilian industry, to increase productivity, and, in turn, to improve the U.S. international competitive position,
 - b) and, to orient policies and practices insofar as is practicable, to new technology opportunities in the Civilian sector. The policies and Technology opportunities should be directed at basic national needs and/or economic opportunities.

New Technology Opportunities

Anti-Trust & Patent Laws Task Force: Potential Areas of Concentration

- 1) Webb-Pomerene Act of 1918 - For protection of small U. S. exporters
- 2) Clayton Act of 1914 which deals with effective remedies to persons injured by violation of anti-trust laws.
- 3) The Sherman Act of 1890 which outlaws all combinations and conspiracies in restraint of Interstate and Foreign Commerce.
- 4) Federal Trade Commission Act of 1914 which creates the Federal Commission to eliminate unfair methods of competition in Commerce.
- 5) Wilson Tariff Act of 1894 which seeks to preserve competition in the U. S. Import Trade.
- 6) U. S. Patent Laws
- 7) Scott Patent Reform Bill
- 8) Patent Procurement Practices
- 9) Patent Licensing
- 10) Patent Enforcement
- 11) Technology Transfer Agreements
- 12) Business "Off Set" Agreements
- 13) International mergers
- 14) Competition Against Nationalized Industries which combine National Treasury Development Funding and operational subsidy.
- 15) Anti-Trust Impedements to Diversification

- 16) Anti-Trust Impedements to Mergers of Small Business into a more efficient and competitive Firm.
- 17) A Review of Foreign Industry - Government relationships in areas working against U. S. Trade.
- 18) Anti-Trust Considerations when U.S. firms are competing against foreign cartels.
- 19) Anti- Trust and Patent policies as they impact upon U.S. industries and plants in foreign nations.
- 20) Any others that the Task Force feels are appropriate to the charter.

New Technology Opportunities

Anti- Trust & Patent Laws Task Force: Potential Sources of Ideas

- 1) Industrial Trade Organization
- 2) Technology Intensive Business Firms
- 3) Government Agencies:
 - DOD, OST, AEC, CEA, OMB, Justice, SBA, Commerce, Treasury
- 4) Individuals of National and/or International Repute in the R&D and Export Community.
- 5) Academia

New Technology OpportunitiesAnti-Trust & Patent Laws Task ForceSchedule

- | | | | |
|----|---|----|-----------------------|
| 1. | Chairman to Assemble Task Force | -- | 1 September 1971 |
| | Agreements on: | | |
| | 1) Membership | | |
| | 2) Charter | | |
| | 3) Potential Area of Review | | |
| | 4) Potential sources of Ideas | | |
| | 5) Schedule of Assignments and Due Dates | | |
| | 6) Set-up Review of Available Material | | |
| 2. | Request Potential Sources for Contribution | | |
| | 1) Send out Requests | | 3 September 1971 |
| | 2) Replies Received | | 27 September 1971 |
| 3. | Receive "Technical Opportunities Inputs"
(L. Goldmuntz) | | 8-14 September 1971 |
| 4. | Receive D.O.D. Congressional
"Government Practices on Procurement" Committee Report | | |
| | 1) Utilization of Resources
(J. Roach & J. Carpenter) | | October-November 1971 |
| | 2) R&D Procurement Process
(J. Roach & J. Carpenter) | | 1 September 1971 |
| | 3) Major Systems Acquisition
(D. Soergel) | | 15 September 1971 |
| 5. | Receive Federal Council on Science and Technology
Report "international Transfer of Technology" from
Treasury Department (J. Petty) | | 27 September 1971 |
| 6. | Receive Commerce Department Study,
"innovation in Government Industry
Arrangement" (J. Lynn) | | 29 September 1971 |

7. Task Force Progress Review

- | | | |
|---|----------|-------------------|
| 1) Review of Available Material | Complete | 15 September 1971 |
| 2) Review of Outside Source | Material | 4 October 1971 |
| 3) Complete Draft of Task Force Recommendation | | 15 October 1971 |
| 4) Review Recommendation | ST / OMB | 19 October 1971 |
| 5) Review Ehrlichman, Shultz, Peterson,
Flanigan | | 23 October 1971 |
| 6) President's Final Plan | | 25 October 1971 |

New Technology Opportunities

Anti-Trust & Patent Law Task Force: Review of Criteria Outline

1. Descriptions of Item
2. Sources of Item
3. Need for Item
 - a. Who benefits (what industries, what geographical locations, etc.)
 - b. Why (importance)
 - + Urgent National Problem and Social Benefits
 - + Opportunity for Economic Growth
 - + Export or Import Replacement (Balance of Trade)
 - + Employment Impact
 - + Technical Leadership Impact
 - + National Security Impact
 - + Enhanced Foreign Policy Impact
 - + Improved Productivity Impact
 - + Resources Saving Impact
 - c. What are the payoffs (social, and economic areas, industry etc.)
 - d. When needed?
4. Feasibility
 - a. Analysis
 - + Results
 - + Who did Analysis
 - + Risks
 - b. Alternatives (Trade-offs)
 - + Risks (side-effects, problems areas, international impact,

social and business barriers, etc.)

c. Past Experience

- + Tried before?
- + By whom and results?
- + Other nations related experience?

UNITED STATES GOVERNMENT

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY*Memorandum*

SUBJECT: New Technology Opportunities Review of
Federal Incentives for Private Investment in
R&D - Ref. (1) Memo dated 2 Aug 1971, same
subject, McCrackin and David to Distribution

DATE:

In reply
refer to:

FROM : W. M. Magruder

TO : Attached List of Addresses (Attachment A)

It is requested that Don Rice convene the Working Group shown in Attachment A, to accomplish the charter shown in Attachment B, in order to seek out sensible incentives to generate a more vigorous pace of innovations in U.S. industry, to increase industrial productivity, to improve the U.S. competitive international position and to orient the incentives to enhance early and effective action aimed at urgent national needs and/or economic opportunities. A tentative schedule of action is shown in Attachment E which will allow adequate time to consider at least the potential incentives offered in Attachment C and to contact the source of incentives shown in Attachment D for innovative ideas. An outline of the review material to be generated is shown in Attachment F.

W. M. Magruder

MEMORANDUM

THE WHITE HOUSE
WASHINGTON

August 2, 1971

MEMORANDUM FOR

THE PRESIDENT

Subject: Federal Incentives for Private Investment in R&D

In our memorandum to you of April 14, 1971, we recommended a feasibility study of tax incentives to increase private investment in R&D. Its purpose would be to generate a more vigorous pace of innovation in civilian industry, to increase productivity and, in turn, to improve our international competitive position.

Based on further study, we strongly recommend a set of federal incentives to encourage industrial support of R&D including, but not limited to, tax incentives. The essential conclusions of our study are as follows:

1. A number of economic studies indicate that the U. S. is under-investing in civilian R&D. This probably occurs because individual firms do not have sufficient incentive to innovate. The results of research, particularly the more exploratory and basic research, can often be used without payment of royalties or other fees by firms other than the one making the innovation. Hence the innovator may recover only a portion of the true economic value of his innovation.
2. A tax credit should be given for R&D expenditures by firms. If the definition of R&D used for tax purposes is carefully formulated, a tax can be administered reasonably well by Treasury.
3. Since a tax credit based on company-financed R&D would tend to emphasize mainly applied research of primary interest to individual firms, the tax credit should be supplemented with the following measures:
 - a. A special tax credit for industrial support of R&D in the universities to encourage basic and exploratory research of potential industrial importance and to stimulate a two-way flow of ideas and scientific and engineering talent between industry and the universities;
 - b. Grants distributed on the basis of competitive bidding by industry and trade associations to encourage firms collectively to support research of common interest to the extent permitted by antitrust laws;

- c. Awards to a small number of individuals and firms for research results of unusual benefit to the economy and society.

4. A program of R&D grants to firms to increase their competitiveness in export trade is needed to promote key exports and to assist adjustment to increased import competition.

Since there has been little U. S. experience to predict the effectiveness of federal incentives in stimulating private R&D investment, a pilot program that includes a variety of incentives at relatively moderate (but meaningful) costs seems indicated. Accordingly, we propose the following package of federal incentives:

<u>Incentives</u>	<u>Estimated Federal Cost</u>
a. <u>A 5% tax credit based on corporate investment in R&D, with a refundable tax credit for firms whose tax liabilities fall short of their credit. The definition of R&D developed by NSF with industry (which excludes the social sciences and marketing research) would provide a workable basis for administering the tax credit. Some modifications, such as the deletion of overhead expenses, will be needed to facilitate administration.</u>	\$600 million
<u>The cost estimate assumes that "qualified" R&D would be \$10 billion in 1972 without a tax credit and \$12 billion with a credit.</u>	
b. <u>A 25% tax credit for firm support of university research (about \$100 million in 1971), assuming that 1972 university support would be increased to \$160 million by the tax credit.</u>	\$ 40 million
c. <u>Matching funds for R&D performed or contracted by industrial associations (about \$100 million in 1971) awarded on the basis of competitive bidding to maximize private contributions.</u>	\$ 50 million

Federal Incentives for Private Investment in R&D

Current interest in stimulating R&D activity stems from a number of related concerns:

1. There is a growing body of evidence that the economic return to R&D is very high relative to the rate of return on other investment. In other words, the country currently is underinvesting in R&D.
2. Even though the statistical evidence indicates underinvestment, the share of GNP devoted to R&D has been falling as a result of declining federal support for R&D through the defense and space budgets.
3. The maintenance of the predominant U. S. role in the world economy requires a relatively high economic growth rate, and a strong competitive position in international trade which has heavily depended on U. S. technological leadership in such areas as jet aircraft and computers. Increases in R&D expenditures can play a role in attaining both of these goals.
4. Defense and space cutbacks have resulted in the underutilization of scientists and other highly trained, technical workers. Although unemployed scientists and engineers constitute a very small proportion of total unemployment, their situation has considerable political impact, because failure fully to employ this highly educated group symbolizes a national failure to many voters.

Evidence on underinvestment

The present tax system provides a significant subsidy to R&D by allowing firms to deduct R&D expenditures immediately rather than requiring them to regard R&D as a capital investment which should be written off over time. Despite this subsidy, a number of economists have estimated that the marginal rate of return to R&D in a variety of industries tends to be higher than the marginal rate of return to ordinary investments. The measurement of the return to R&D faces some serious conceptual difficulties and the results of studies are sensitive to the assumptions on which they are based. Therefore, not all economists are convinced by the evidence, but it is fair to say that the sceptics are in a minority.

A relatively high marginal rate of return does not by itself mean that an additional subsidy is warranted, because the return on R&D to society may be uncertain and society may be justified in demanding a high risk premium. However, many believe that the rate of return is kept up by other factors which do warrant an additional subsidy. First, the individual's incentive to invest in R&D is diminished by the possibility that the resulting innovation will be quickly copied or otherwise used by competitors. Moreover, the new idea may have applications in other

industries that are not contemplated by the innovator. To some extent the innovator can protect himself with patents, but often an idea is not patentable, or the patent can be circumvented. Consequently, the R&D investor captures only a portion of the true economic value of his invention. The capturable portion of the total return tends to be smallest for basic research and for this reason underinvestment is probably most serious in this area.

Second, R&D investment is held down not only because the returns are not all capturable by the innovator, but also because he is uncertain about the portion that he can capture. Hence, the risk attached to an R&D investment is higher to the innovator than it is to society as a whole, and the free market does not devote a socially optimum amount of resources to R&D.

On the basis of these considerations we have concluded that there is probably underinvestment and that further subsidies are warranted. Subsidies can be provided using any of the following measures:

A. Tax Credits

PROPOSAL 1: Firms should be allowed to reduce their tax liabilities by an amount equal to 5 per cent of their expenditures on R&D in their own firm, in independent firms or in industrial associations. The tax credit should take the form of a refund to firms whose tax liabilities fall short of their credit. The National Science Foundation definition of R&D could be used, with some modifications, as a basis for the credit. This definition has been worked out with industrial firms and explicitly excludes social science, psychological, and market research. Although such research can be socially valuable, it is difficult to identify it with precision and, thus, should be excluded to ease the administration of the tax credit. For the same reason, overhead expenses related to R&D should be excluded because of the difficulties which would be faced by the tax authorities in allocating overhead between R&D and other activities.

Advantages

1. The choice of R&D projects is made by the firm and thus no government bureaucracy is required to select projects.

2. The credit is equally available to all industries and no one group or institution becomes highly dependent on the subsidy or acquires a permanent claim on federal dollars.

3. The business community is well acquainted with tax credits.

Disadvantages

1. The firm will choose the R&D projects with the highest profits to its owners without regard to the innovation's beneficial effect on the rest of society. Consequently, the tax credit does not directly focus on areas where the return to society greatly exceeds the private return.
2. The tax credit will be difficult for the Treasury to administer.
3. The tax credit will subsidize some R&D which the firm would have been willing to do without a subsidy and will, therefore, provide firms with a windfall. There will be political opposition based on this point.
4. The credit is not automatically subject to budget review and may tend to outlive its usefulness. However, this may not be an important problem. Many thought that the investment tax credit would escape review, but, in fact, it has constantly been re-evaluated.

PROPOSAL 2: A tax credit of 25 per cent to the firm for R&D which it finances in universities.

Advantages

1. Because universities concentrate on basic and exploratory research, it will be encouraged the most. This is probably where underinvestment is most serious.
2. It will strengthen the ties between the university and business communities.
3. Support of university research in the physical sciences and engineering would be strengthened to offset reductions in the financial support provided by NASA and the DOD.

Disadvantages

1. Some may protest that university research will be biased to suit the needs of industry rather than toward those of society as a whole.

PROPOSAL 3: A grant program, costing \$50 million, should be used to subsidize R&D in the sectors of the economy most affected by international trade. The grants could be used to develop new products for export or to meet import competition. They could also help the industries most damaged by imports competition to adjust by developing new products or processes for domestic markets.

Advantages

1. The grants are focused on a problem of vital concern to many and may help to forestall more restrictive and discriminatory approaches to that problem.
2. The budget costs of the program can be predetermined.

Disadvantages

1. Since R&D takes a long time to pay off, the policy will not help much with our current balance of trade problem.
2. Many will argue that the policy will have only a minor impact on a major problem and that more fundamental reforms are required.
3. The agency making the grant will be subject to political pressures to spread the grants among geographical regions and industries, and this will constrain their ability to focus the grants where they will be most beneficial to our long-run trade balance.

The study committee considered a broader and more expensive grant program to support company R&D in activities unrelated to international trade. The proposal was rejected because of the difficulty for a government agency to assess the true economic potential of the projects, and the likelihood of strong political pressures to make grants for "glamor" projects. There would also be pressures to spread the grants between regions and industries in a way that would diminish the economic pay-off to the investment.

B. Subsidies to Associations of Firms

PROPOSAL: In a number of industries, research associations have been formed to do research of long-run interest to their members. This type of activity should be encouraged with a federal subsidy. The subsidy should be distributed on the basis of competitive bidding by associations, i.e., federal funds would be auctioned off to the bidder offering to match the federal grant

with the highest amount of private funds. Associations would be financed by membership fees. Initially, the total subsidy fund would be set at \$50 million. The association and not the government would choose the projects, and the work would be performed in non-member firms and non-profit institutions, in order to diminish the possibility of collusion in restraint of trade. For the same reason membership in an association would not be restricted.

Advantages

1. Associations would perform the type of R&D which would have benefits for the whole group that are difficult to capture by the individual firm. Presently, underinvestment is likely to be significant in this type of R&D.
2. The bidding procedure diminishes the chance that the government would subsidize projects which the association would have undertaken without a subsidy. This result occurs because associations would tend to request the minimum percentage subsidy necessary to make additional projects worthwhile from their point of view.

Disadvantages

1. Only a few associations currently exist and they are difficult to organize for the purpose of carrying out a particular type of R&D where a large number of small firms have an interest. A small firm knows that its membership fee will make only a small impact on the probability that a project will be successful and at the same time it has a good chance of benefiting from the R&D even if it stays out of the association. A federal subsidy will make membership more attractive because each individual's contribution will be matched by a grant and thus have more of an impact on the probability that the R&D will be successful. However, the problem of attracting members will persist to some degree and the fact remains that new associations will be easiest to organize where only a few large firms have an interest in particular types of R&D. Consequently, it can be expected that the first federal dollars would go to oligopolistic industries.
2. Antitrust laws require that membership be kept open and this limits the extent to which a few firms can combine to engage in the type of R&D where all of the benefits can be captured by the members. This diminishes the attractiveness of the associations to individual firms, and will curb the response of associations to the subsidy.

Stacy

C. Prizes

PROPOSAL: A \$10 million fund should be established to reward outstanding R&D achievements. Recipients would be rewarded three years after the achievement, so that the panel giving the prize has a better chance of assessing the real magnitude of the achievement. The fund could provide for nine \$100,000 prizes (\$100,000 would be left over for administrative expenses) or it might be preferable to have a few larger prizes for particularly meritorious achievement. Prizes would be granted to individuals, firms, or to non-profit institutions.

Advantages

1. The prize focuses on the output of research whereas the other proposals support inputs to research. In other words, prizes place more of a premium on success.
2. The prize will convey prestige as well as a monetary reward and will enable the nation to show that it highly values scientific achievements.
3. The prize can reward innovators who benefit society as a whole without winning a large monetary return for themselves. Thus it may encourage R&D where there is presently significant underinvestment.

Disadvantages

1. The prize-granting panel will be subject to the same sort of political pressures faced by those distributing grants.
2. It will be difficult to develop criteria for choosing prize recipients.
3. The fact that the prize is uncertain and is delayed until three years after the project is completed will diminish its incentive effects.

Conclusions

The study group also investigated several other tax incentives, grants, and credit schemes but concluded that they were all definitely inferior to those listed above.

Because the foregoing proposals focus on somewhat different types of R&D, and because each has certain disadvantages, it was decided not to depend heavily on any one proposal. Therefore, a package approach was chosen. Our specific recommendations are outlined in the accompanying memorandum.

TECHNOLOGY INCENTIVES TASK FORCE:MEMBERS

<u>NAME</u>	<u>DEPT</u>	<u>BACKGROUND</u>
Don Rice	OMB	Chairman System Analysis
Herb Stein	CEA	General/Econ.
Dave Beckler	OST	General
Mike Moscow	Labor	General
Joel Segall	Treasury	Tax
Bill Niskanen	OMB	System Analysis
Jim Conner	DOC	Industry
Tony Chase	SBA	Industry
Jon Rose	W.H.	
<i>Lev Eugman</i>		
<u>OTHERS</u>		
Hal Passer	DOC	Econ/Employment
Hudson Drake	DOC	Industry
J. Carpenter	DOD	
Ray Bisplinghoff	NSF	
	Federal Reserve Bank	
Ed Ball	DOD	
John Foster	DOD	
Lt. Gen R. Coffin	DOD	
Elliott Harwood	DOD	
Karl Harr	AIA	Industry
Herman Shipley	AIA	
	AEC	
Dick FitzSimmons	NASC	Industry

TECHNOLOGY INCENTIVES TASK FORCE:

CHARTER

PURPOSE:

- (1) Generate a more vigorous pace of innovation in civilian industry, to increase productivity and, in turn, to improve the U.S. international competitive position.
- (2) To orient the incentives, insofar as is practicable, to new technology opportunities in the civilian sector. The incentives and technology opportunities should be directed at basic national needs and/or economic opportunities.

TECHNOLOGY INCENTIVES TASK FORCE:

POTENTIAL INCENTIVES

1. Tax credits for corporate investment in R&D.
2. Tax credits for industry support of university research.
3. Awards to individuals or firms for research results of annual benefit to the economy and/or society.
4. Matching funds for R&D performed by Industrial Associations.
5. Grants to companies for R&D to promote exports.
6. Procurement incentives.
7. Cost share in R&D aimed at urgent national needs.
8. Tax depreciation on R&D oriented capital equipment.
9. Increased industrial rights in government sponsored R&D.
10. Revision of Government Practices involving IR&D regulations.
11. Others

TECHNOLOGY INCENTIVES TASK FORCE:

POTENTIAL SOURCES OF
INCENTIVES IDEAS

1. Industrial trade organizations
2. Technology intensive business firms
3. Government agencies:
 - DOD, OST, AEC, CEA, OMB, Labor, Treasury, Commerce,
SBA, NSF, NASA, FAA, Federal Reserve Bank, DOT
4. Individuals of national reput e in R&D community
5. Non-profit R&D organizations
6. Academic

TECHNOLOGY INCENTIVES TASK FORCE:SCHEDULE

1. Chairman to assemble task force 1 Sept 1971
 - Agreement on:
 - 1) membership
 - 2) charter
 - 3) potential incentives
 - 4) potential sources of incentives
 - 5) schedule
2. Request potential sources for contribution
 - 1) send out request from each task 3 Sept 1971
 force member
 - 2) replies received from sources 27 Sept 1971
3. Receive "Technical Opportunities Inputs) (L. Goldmuntz) 8 thru 14 Sept 1971
4. Receive DOD Congressional Review
 "Government Practices in Procurement) Committee Report
 - 1) R&D procurement process (Jim Roach, 1 Sept 1971
 J. Carpenter)
 - 2) Major systems acquisition (P. Soergel). 15 Sept 1971
5. Receive CEA/OST: federal incentives for private 2 August 1971
 investment in R&D
6. Receive Department of Commerce Study on 29 Sept 1971
 "Innovation in Government/Industry Arrangement"

ATTACHMENT E
(Cont'd)

7. Receive Federal Council on Science and Technology Report 27 Sept 1971
"International Transfer of Technology" for Treasury Report
(John Petty)
8. Complete draft of incentive plan
 1) sub tasks to chairman 8 Oct 1971
 2) committee review of plan 15 Oct 1971
9. Reviews to incentive plan
 1) Preliminary review of actions 6 Sept 1971
 2) OST/OMB/Final plan 18 Oct 1971
 3) Ehrlichman, Shultz, Flanigan, Peterson) 22 Oct 1971
 4) President's final plan 27 Oct 1971

TECHNOLOGY INCENTIVES TASK FORCE: REVIEW & CRITERIA OUTLINE

1. Description of incentive
2. Need
 - a. Who benefits (what industries, what geographical locations, etc.)
 - b. Why (importance)
 - + Urgent national problem and social benefits
 - + Opportunity for economic growth impact
 - + Exports or import improvement (Balance of Trade)
 - + Employment impact
 - + Technical leadership impact
 - + National security impact
 - + Enhanced foreign policy impact
 - + Improved productivity impact
 - + Resources saving impact
 - c. What are payoffs (social and economic areas, industry, etc)?
 - d. How much needed (budget impact in size of incentive)?
3. Feasibility
 - a. Analysis
 - + Results
 - + Who did analysis

ATTACHMENT F
(continued)

b. Alternatives (trade-offs)

- + Risks (side effects, problem areas, international impact, social barriers, etc.)

c. Past experience

- + Tried before
- + By whom and results

UNITED STATES GOVERNMENT

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE SECRETARY

Memorandum

DATE: 31 August 1971

In reply
refer to:

SUBJECT: New Technology Opportunities Review of
Restrictive Labor Policies

FROM : Director, SST Development

TO : Attached List of Addresses (Attachment A)

REF: Domestic Council Study - "Evaluation of New Technology
Opportunities" dated 1 July 1971 from John Ehrlichman to
Agencies

1. It is requested that _____ convene the working group shown in Attachment A, to accomplish the charter shown in Attachment B, in order to seek out sensible new technology opportunities that will generate a more vigorous pace of innovation in the U.S. industry, to increase industrial productivity, to improve the U.S. competition international position and to perhaps orient labor policies toward early and effective action aimed at urgent national needs and/or economic opportunities. A tentative schedule of activities is shown in Attachment E, which is meant to allow adequate time to consider at least the potential areas of concentration shown in Attachment C, and, to contact the potential sources of innovation ideas shown in Attachment D. An outline of this review material to be generated is shown in Attachment F.

W. M. Magruder

New Technology Opportunities

Restrictive Labor Policies Task Force:

Members

Ed Morgan

W.H.

Legal
~~Public Relations~~

Jon Rose

W.H.

R. George Crawford

W.H.

Commerce

SBA

OMB

CEA

Justice

Treasury

~~DOT~~

CAB

Industry*

Labor

*Consulting basis as required

New Technology Opportunities

Restrictive Labor Policies Task Force:

Charter

- Purpose: 1) Examine and inventory existing restrictive labor policies and evaluate their impact in all aspects as these policies relate to new technology opportunities designed to generate:
- a. A more vigorous pace of innovation in civilian industry, to increase productivity and, in turn, to improve the U.S. international competitive position.
 - b. and to orient the making of new labor policies toward new technology opportunities in the civilian sector. The technology opportunities should be directed at basic national needs and/or economic opportunities.
- 2) Examine Anti-Trust and Patent Law Policy Application
 - 3) Develop a methodology for discussions with industry, labor, consumers and government.
 - 4) Develop a public relations program as technology and labor initiatives evolve.

New Technology Opportunities

Restrictive Labor Policies Task Force:

Potential Areas of Concentration

- 1) Review of Existing Labor Policies Impacting upon New Technology
i.e. Transportative, Air Traffic Control, etc.
- 2) Explore Anti-Trust and Patent Law Applications in New Technology
Needs.

New Technology Opportunities

Restrictive Labor Policies Task Force:

Potential Source of Ideas

- 1) Industrial Trade Organization
- 2) Technology Intensive Business Firms
- 3) Government Agencies
 - . Commerce, Transportation, SBA, OMB, Interior, Agriculture, HUD, HEW, DOD, NASA, & AEC.
- 4) Individuals of National Repute in R&D Community.
- 5) Academia

New Technology OpportunitiesRestrictive Labor Policies Task Force:Schedule

1. Chairman to Assemble Task Force 1 Sept 1971
 - . Agreements on
 - 1) Membership
 - 2) Charter
 - 3) Potential Areas of Review
 - 4) Potential Sources of Ideas
 - 5) Schedule of Assignments and Due Dates
 - 6) Organize Review of Available Material
2. Request Potential Sources for Contribution
 - 1) Send out Requests 31 Sept 1971
 - 2) Replies Received 22 Sept 1971
3. Receive "Technical Opportunities Inputs"; (L. Goldmuntz) 8 thru 14 Sept 1971
4. Receive DOD Congressional Review
"Gov't. Practices on Procurement"
 - 1) Cost and Pricing Information (B. Hall)
 - 2) R&D Procurement Process (J. Roach & J. Carpenter) 1 Sept 1971
 - 3) Major Systems Acquisition (p. Soergel) 15 Sept 1971
5. Receive Federal Council on Science and Technology
"International Transfer of Technology" from Treasury
Department (J. Petty) 27 Sept 1971
6. Receive Commerce Dept Study "Innovation in Govt.
Industry Arrangement" (J. Lynn) 29 Sept 1971

- | | |
|--|--------------|
| 1) Review of Available Material Complete | 15 Sept 1971 |
| 2) Review of Outside Source Material | 4 Oct 1971 |
| 3) Complete Draft or Task Force Recommendation | 15 Oct 1971 |
| 4) Review of Recommendations OST/OMB | 20 Oct 1971 |
| 5) Review Ehrlichman, Shultz, Peterson, Flanigan | 25 Oct 1971 |
| 6) Pres. Final Review | 27 Oct 1971 |

New Technology Opportunities

Restrictive Labor Policies Task Force:

Review Outline

1. Description of Policy and/or Practice
2. Source of Policy and/or Practice
3. Need for Revision to Policy
 - a. Who Benefits (what industries, what geographical locations etc.)
 - b. Why (Importance)
 - + Urgent National Problems and Social Benefits
 - + Opportunity for Economic Growth
 - + Employment Impact
 - + Technical Leadership Impact
 - + National Security Impact
 - + Enhanced Foreign Policy Impact
 - + Improved Productivity Impact
 - + Resources Saving Impact
 - c. What are the pay offs (social and economic areas, industry, etc.?)
 - d. When needed?
4. Feasibility
 - a. Analysis
 - + Results
 - + Who did analysis
 - + Risks
 - b. Alternatives (Trade-offs)
 - + Risks (Side effects, problem areas, international impact labor impact, social and business etc.)
 - c. Past Experience
 - + Tried before? When?
 - + By whom and results
 - + Other nations related experience.

WORKING GROUP

1. TRANSPORTATION - Bud Krogh, Deputy Assistant
(Charles Clapp, Spec. Asst. to Pres.)
2. COMMUNICATIONS AND SOCIAL NEEDS - (No one from White House Staff -
only OST)
3. NATIONAL RESOURCES - John Whitaker +OST
(Dick Fairbanks)
4. URBAN/SUBURBAN DEVELOPMENT - John Whitaker
~~John Price~~
Vicki Keller
5. PRODUCTIVITY - a) Peter Flanigan / Peter Peterson / *Geo Shultz*
b) " " " "
c) " " " "
d) John Whitaker, (Dick Fairbanks)
6. HEALTH CARE - Ken Cole (*Cavanaugh*)
7. NUTRITION - Ken Cole (*Cavanaugh*)
8. WASTE MANAGEMENT - John Whitaker
(Dick Fairbanks)
9. TECHNOLOGIES FOR MEETING THE AIR QUALITY - John Whitaker
STANDARDS ECONOMICALLY (Dick Fairbanks)
10. GLOBAL ENVIRONMENTAL MONITORING - John Whitaker
(Dick Fairbanks)
11. PROTECTION FROM NATURAL DISASTERS -

Tech Transfer - Ed Harper
Ray Waldmann

WORKING GROUP

1. TRANSPORTATION - Bud Krogh, Deputy Assistant
(Charles Clapp, Spec. Asst. to Pres.)
2. COMMUNICATIONS AND SOCIAL NEEDS - (No one from White House Staff -
only OST)
3. NATIONAL RESOURCES - John Whitaker
(Dick Fairbanks)
+ OST
4. URBAN/SUBURBAN DEVELOPMENT - John Whitaker
~~John Whitaker~~
Vicki Keller
5. PRODUCTIVITY - a) Peter Flanigan / Peter Peterson
b) " " "
c) " " "
d) John Whitaker, (Dick Fairbanks)
Go Study
6. HEALTH CARE - Ken Cole (Cavanaugh)
7. NUTRITION - Ken Cole (Cavanaugh)
8. WASTE MANAGEMENT - John Whitaker
(Dick Fairbanks)
9. TECHNOLOGIES FOR MEETING THE AIR QUALITY
STANDARDS ECONOMICALLY - John Whitaker
(Dick Fairbanks)
10. GLOBAL ENVIRONMENTAL MONITORING - John Whitaker
(Dick Fairbanks)
11. PROTECTION FROM NATURAL DISASTERS -

ADMINISTRATIVELY CONFIDENTIAL
EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY
WASHINGTON, D.C. 20506

August 27, 1971

TO: Attached list of addresses (Attachment A)

FROM: Dr. L. A. Goldmuntz, OST

SUBJECT: Schedule, Policy and Outline for Agency Presentations of
Material in Response to Domestic Council New Technology
Opportunities program

REFERENCE: (1) Domestic Council Study - Evaluation of New Technology
Opportunities dated 1 July 1971, from John Ehrlichman
to Agencies

(2) Memorandum for Working Group for Domestic Council
New Technology Study dated 24 August 1971, from Lawrence
Goldmuntz

1. Some of the working group reports, due August 24th, have been submitted and reviewed. While much of the material is excellent, much of it has not been evaluated against the criteria suggested in reference (1) (Attachment A) with a reasonable degree of thoroughness and objectivity.

2. In order to expedite approval of material submitted in accordance with reference (2) (Attachment B), each agency working group should prepare a synopsis of its material in accordance with the outline offered in Attachment C. If this outline is not universally applicable, make appropriate modifications that are justified by the nature of your subject matter. There have been some schedule changes made at your request in the reviews enumerated in reference (2) (Attachment B).

3. In order to present your material effectively at the review, please reduce the synopsis, described above, to a set of briefing charts as shown by way of illustration in Attachment D. The briefing charts are required by the time of the second review and would be most helpful if available by the time of the first review.

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The study should apply these basic criteria to each technology project or program before any increased funding is recommended to the President.

1. Importance: Project or program must relate (a) to a significant and urgent national problem which is broadly recognized by the public, or (b) to a significant opportunity for economic growth, increased exports, or technological leadership.

2. Pay Off: The cost/benefit ratio must be favorable. What are the social and economic benefits - including impact on balance of trade, productivity and employment? What will be the distribution of benefits among different industries and areas of the country?

3. Public Impact: Can visible progress be shown within a reasonable period - including significant progress in planning and design by next summer? A timetable must be provided by fiscal year for each phase of development: planning, design, pilot, demonstration, etc.

4. Budget Impact: What are estimated long-term costs over next six years or full systems cost?

5. Non-Federal Support: What is the feasibility and likely maximum extent of cost sharing by industry? Can the project be achieved through steps short of direct Federal funding: regulation or de-regulation, standard setting?

6. Potential Problems: Are there potential institutional or economic barriers to acceptance and implementation of the technology and how are they to be overcome? Are there any undesirable side effects from the technology and how are they to be dealt with?

7. Organization and Management: Assuming several programs or projects meet the above criteria, what kind of organization (existing agencies, new agency, or quasi-public corporation) should be created (if any) or redirected to carry out these programs?

The study should have two phases: (1) an interim report due the President September 1, and (2) a final report due the President November 15.

Dr. Edward David, the Director of the Office of Science and Technology and the President's Science Adviser, will chair the sub-committee and John Whitaker will have Domestic Council staff responsibility.

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BY [Signature]
OMB
EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY
WASHINGTON, D.C. 20506

24 August 1971

MEMORANDUM FOR

Chairmen and Deputy Chairmen of Working Groups
for the Domestic Council Study on New Technology Opportunities

Subject: Review of Working Group Inputs

There is attached a list of working groups and a schedule for review of working group inputs. It is expected that you will have written drafts available for OST review two days before the review date. Each review will be held in the office of the working group. Would you be so kind as to inform Miss Lee Siveck of my office (ph: 395-3534) the specific room number and address where your review will be held. All day reviews start at 9:00 AM. Evening reviews will start at 6:30 PM.

Lawrence A. Goldmuntz
Lawrence A. Goldmuntz

Attachments:

1. List of Working Groups
2. Schedule for Review of Inputs

cc: Dr. David

Mr. [Signature]
Dr. [Signature]

DOMESTIC COUNCIL NEW TECHNOLOGY OPPORTUNITIESSCHEDULE FOR REVIEW OF WORKING GROUP INPUTS

<u>Date</u>	<u>1st Draft</u>	<u>2nd Draft</u>	<u>Chairman</u>	<u>Agency</u>	<u>Phone No.</u>
8 Sept. - all day	x		Al Linhares	DOT	426-4228
8 Sept. - evening	x		N. P. Ralston	Agric.	388-7107
9 Sept. - all day	x		Walter Hinchman	OTP	395-5190
9 Sept. - evening	x		Clayton Jensen	NOAA	496-8971
10 Sept. - all day	x		Frank Clarke	Interior	183-5301
11 Sept. - all day	x		Harold Finger	HUD	755-5600
13 Sept. - all day	x		Robt. Cairns	DOC	189-3966
13 Sept. - evening	x		Mel Taff	HEW	13-28407
14 Sept. - all day	x		John Townsend	NOAA	496-8202
14 Sept. - evening	x		Stanley Greenfield	EPA	254-6786
15 Sept. - all day		x	Al Linhares		
15 Sept. - evening		x	N. P. Ralston		
16 Sept. - all day		x	Walter Hinchman		
17 Sept. - all day		x	Frank Clarke		
17 Sept. - evening		x	Clayton Jensen		
18 Sept. - all day		x	Harold Finger		
21 Sept. - all day		x	Robt. Cairns		
21 Sept. - evening		x	Stanley Greenfield		
22 Sept. - all day		x	John Townsend		
23 Sept. - evening		x	Mel Taff		

DOMESTIC COUNCIL NEW TECHNOLOGY OPPORTUNITIES
WORKING GROUPS

The following technical groups are active in support of the Domestic Council study on new technology opportunities:

1. TRANSPORTATION

Chairman: Dr. Robert Cannon, DOT (ph: 426-4461)
Assistant Secretary (Systems
Development & Technology)

Deputy: Mr. Alfonso Linhares, DOT (ph: 426-4228)
Chief, Technology Assessment &
Operations Analysis Div.

In addition to the inputs supplied by DOT personnel, there will be inputs on:

A. Aeronautics

Chairman: Mr. Roy P. Jackson, NASA (ph: 963-4445)
Associate Administrator for
Advanced Research & Technology

B. Advanced Automotive Propulsion

Chairman: Mr. Eric Stork, EPA (ph: 443-4326)
Acting Director, Bureau of
Mobile Source Pollution Control

This one will be submitted through:

Dr. Stanley Greenfield, EPA (ph: 254-6786)
Assistant Administrator for
Research & Monitoring

Both the NASA and EPA submissions are to be made in parallel to:

Dr. Lawrence A. Goldmuntz, OST (ph: 395-3534)
Dr. Robert Cannon, DOT (ph: 426-4461)

2. COMMUNICATIONS AND SOCIAL NEEDS

Chairman: Mr. Walter Hinchman, OTP
Assistant Director

(ph: 395-5190)

There are three working groups reporting to the Steering Committee chaired by Mr. Hinchman:

A. Working Group on Communications Capabilities

Chairman: Mr. Leonard Jaffe, NASA
Deputy Associate Administrator,
Space Science & Applications (Applications)

(ph: 13-37344)

This group is covering satellite, cable and teleprocessing technologies.

B. Working Group on Government and Commercial Services

Chairman: Mr. Donald Haag, U.S. Postal Service
Manager, Advanced Systems Concepts
Development Division

(ph: 961-7862)

This group is defining user needs as they arise from postal services, public safety, disaster warning and State and local administrations.

C. Working Group on Educational and Cultural Needs

Chairman: Dr. Albert Horley, HEW
Director, Office of
Telecommunications Policy

(ph: 963-5940/41)

This group will define needs arising from the education, health care, retraining, and arts/humanities communities.

3. NATURAL RESOURCES

Chairman: Dr. Frank E. Clarke, Interior
Deputy Under Secretary

(ph: 183-5301)

The three major contributions to this effort are being prepared by the following groups:

3. Natural Resources - continued

A. Working Group on Water Resources

Chairman: Dr. William S. Butcher, OST (ph: 395-3527)
Executive Office of the President

B. Working Group on Mineral Resources

Chairman: Dr. Lindsay D. Norman, Interior (ph: 343-3941)
Bureau of Mines

C. Working Group on Continental Shelf Resources and Weather Modification

Chairman: Dr. John W. Townsend, NOAA (ph: 496-8202)
Associate Administrator

4. URBAN/SUBURBAN DEVELOPMENT

Chairman: Mr. Harold Finger, HUD (ph: 755-5600)
Assistant Secretary for
Research & Technology

5. PRODUCTIVITY

Chairman: Dr. Robert W. Cairns, Commerce (ph: 189-3966)
Deputy Assistant Secretary for
Science and Technology

Major inputs are being prepared by the following working groups:

A. Working Group on the International Competitive Stature and Productivity of Key Industries

Chairman: Dr. Harold C. Passer (ph: 189-3523)
Assistant Secretary for
Economic Affairs

B. Working Group on Technologies that are Broadly Supportive of Productivity Improvement, or that can Establish International

Chairman: Dr. Lewis M. Branscomb, Director (ph: 921-2411)
National Bureau of Standards

5. Productivity - continued

C. Working Group on the Utility of State Commerce Extension
Services to Enhance the Efficiency of Industry

Chairman: Mr. William T. Knox, Commerce (ph: 189-3227)
Director
National Technical Information Service

D. Working Group on Deep Ocean Platforms, Ship Automation
and Nuclear Propulsion

Chairman: Mr. Marvin Pitkin, MARAD (ph: 189-2578)
Assistant Administrator for R&D
Maritime Administration

6. HEALTH CARE

Chairman: Dr. Merlin DuVal, HEW (ph: 13-34254)
Assistant Secretary for
Health & Scientific Affairs.

Deputy: Mr. Mel A. Taff, HEW (ph: 13-28407)
Special Assistant to Dr. DuVal

7. NUTRITION

Chairman: Dr. N. P. Ralston, Agriculture (ph: 388-7107)
Associate Director, Science
& Education

8. WASTE MANAGEMENT

Chairman: Dr. Stanley Greenfield, EPA (ph: 254-6786)
Assistant Administrator for
Research & Monitoring

Deputy: Dr. Einar P. Flint, Interior (ph: 343-4743)
Staff Metallurgist, Division
of Solid Wastes

Deputy: Mr. Dale Oyster, EPA (ph: 632-7672/4/5)
Director, Technology Division

9. TECHNOLOGIES FOR MEETING THE AIR QUALITY
STANDARDS ECONOMICALLY

Chairman: Dr. Stanley Greenfield, EPA
Assistant Administrator for
Research & Monitoring

(ph: 254-6786)

10. GLOBAL ENVIRONMENTAL MONITORING

Chairman: Dr. John W. Townsend, NOAA
Associate Administrator

(ph: 496-8202)

Deputy: Dr. Clayton Jensen, NOAA
Chief, Environmental Monitoring Div.

(ph: 496-8971)

11. PROTECTION FROM NATURAL DISASTERS

Chairman: Dr. John W. Townsend

A. Working Group on Weather Warning and Modification-
Chairman being chosen

B. Working Group on Earthquake and Flood Hazards -
Chairman being chosen

C. Working Group on Other Geophysical Hazards -
Chairman being chosen

Outline for Domestic Council
Working Group Review

Technical Development

1. Description of Project

2. Need

- a. Who need (market)
- b. Why (importance)
 - + Urgent national problem and social benefits
 - + Opportunity for economic growth
 - + Exports or import replacement (Balance of Trade)
 - + Employment
 - + Technical leadership
 - + National security
 - + Enhance foreign policy
 - + Improve productivity
 - + Save on product resources
- c. What are payoffs (social and economic areas, industry, etc.)
- d. How much needed (product and funding)
- e. When needed

3. Feasibility

- a. Analysis
 - + Results
 - + Who did analysis
- b. Alternatives (trade-offs)
 - + Risks (side effects, problem areas, social barriers, etc.)
- c. Demonstrations
- d. Market or Need Test
 - + Who did test
 - + Results
 - + Risks
- e. What is R & D cost per year (feasibility of industry cost share)
- f. Impact of regulation or de-regulation
- g. Impact on patent laws or anti-trust laws

4. Development

- a. Analysis vs. test results
- b. Verification tests
- c. Specification development

5. Prototype or Demonstration
 - a. Model
 - b. Full scale
 - c. Results
 - d. Risks
6. Production or Implementation
 - a. Who does it
 - b. Where performed
 - c. How managed
 - + alternatives
 - d. Impact on patent laws or anti-trust laws
 - e. Risks
 - f. Show development schedule
 - g. Show development costs and manpower (potential of ind.
7. Summary Should Include Implications on
 - a. Domestic need and/or impact
 - + Resources
 - + Transportation
 - + Education
 - + Medical care
 - + Law enforcement
 - + Pollution control
 - + Housing
 - + Other
 - b. Exports or import replacement
 - c. Domestic productivity
 - d. Employment
 - e. Foreign policy
 - f. National security
 - g. Public impact
 - h. Budget impact
 - i. Management method
 - j. Possible government initiatives, incentives, patent law
anti-trust implications

NEW TECHNOLOGY OPPORTUNITY
PROGRAM

V/STOL DEMONSTRATIONS

V/STOL INITIATIVE

OBJECTIVE

THREE MARKET DEMONSTRATIONS TO TEST:

- SOCIAL AND POLITICAL ACCEPTANCE
- ECONOMIC VIABILITY AND PROFITABILITY

SUB OBJECTIVES

INTER/INTRA-URBAN DEMONSTRATION

- ALLEVIATE GROUND CONGESTION
- IMPROVE DOOR-TO-DOOR TRAVEL EFFICIENCY
- COMPATIBILITY OF CTOL-STOL OPERATION

CBD TO CBD (CENTRAL BUSINESS DISTRICT) DEMONSTRATION

- LOW-MEDIUM BUSINESS PATRONAGE DEMAND
- COMMUNITY REACTION TO CBD AVIATION OPERATION

REGIONAL/FEEDER SERVICE

- VIABILITY OF LOW DENSITY FEEDER SERVICE
- RECREATIONAL AND NON-BUSINESS DEMAND POTENTIAL
- REMOTE AREA ACCESSIBILITY

NEED

AIR CARRIER

- CONGESTION & DELAY LOSSES NOW \$158 MILLION - \$1 BILLION BY 1980
- 79% SCHEDULED FLIGHTS ARE 500 MILES OR LESS

AIR PASSENGER

- 50% OF PASSENGER TRIPS ARE 500 MILES OR LESS
- TRAVEL TIMES HAVE INCREASED

AIRSPACE MANUFACTURERS

- NO NEW AIRCRAFT DEVELOPMENT PROGRAM IN BEING
- EMPLOYMENT DOWN FROM 1.4 MILLION TO 900,000

LOCAL/REGIONAL COMMUNITIES

- LACK OF AIRPORT CAPACITY AND NO ROOM FOR EXPANSION
- GROWTH IN SUBURBAN POPULATION (ACCESS TIME INCREASE)
- ENVIRONMENTALLY MORE ACCEPTABLE AIRCRAFT

THE NATION

- WORLD TECHNICAL LEADERSHIP IN AIRCRAFT (BALANCE OF TRADE)
- CONTINUED MOBILITY

IMPORTANCE

- CONGRESSIONAL RECOGNITION OF INADEQUATE AIRWAYS/AIRPORT CAPACITY (AIRPORT/AIRWAY ACT OF 1970)
- V/STOL POTENTIAL FOR ALLEVIATING PORTION OF DEMAND ON CONVENTIONAL FACILITIES
- IMPROVED EFFICIENCY BY SEPARATION OF SHORT & LONG HAUL PASSENGER (POTENTIAL SAVING OF \$400 TO 500 MILLION IN TIME & OPERATING COSTS)
- POTENTIAL FUTURE AIRCRAFT MARKET: 500-1000 VEHICLES
GIVES POTENTIAL BENEFITS OF:
 - \$1.75 BILLION INCREASE IN GNP
 - 250,000 JOBS : DIRECT AEROSPACE
 - 140,000 JOBS : INDUCED IN SUPPORTING INDUSTRIES
 - 260,000 JOBS : INDIRECT EMPLOYMENT
 - \$1.1 BILLION BALANCE OF TRADE

PAYOFFS

◦ REGIONAL ECONOMIC GROWTH

- OHIO AVIATION PROGRAM RESULTED IN:

69,000 NEW JOBS; ADDITIONAL \$250 MILLION PERSONAL INCOME;
1500 MANUFACTURING FIRMS ADDED OR EXPANDED; ADDITIONAL
\$1 BILLION IN CAPITAL

◦ MAINTAIN TECHNICAL LEADERSHIP

- STOL VEHICLES IN SERVICE NOW ARE FOREIGN MANUFACTURED
- TWO FOREIGN COUNTRIES CLOSE TO PRODUCTION COMMITMENT

◦ ENVIRONMENTAL IMPACT

- LAND USE: V/STOL REQUIRES ONLY 5 TO 10% ACREAGE OF CONVENTIONAL FACILITY
- CONVENTIONAL FACILITY LESS OBJECTIONABLE IF DEVOTED PRIMARILY TO LONG HAUL
- TECHNOLOGICAL SPINOFF FROM V/STOL TO CTOL

FEASIBILITY

0 TECHNOLOGY IS NOT MAJOR DELAY FACTOR FOR INTRODUCTION OF DEMONSTRATION V/STOL: PROVEN IN

- AIR METRO '66 DEMONSTRATION
- EASTERN/AMERICAN DEMO IN 1968/69
- PAN AMERICAN/SIKORSKY DEMO IN 1970

0 LOW APPROACHES TO 400 FT. IN NEW YORK DREW NO CITIZEN NOISE COMPLAINTS

0 PROBLEM OF DELAY IS ONE OF SOCIAL, POLITICAL, ECONOMIC ACCEPTANCE

- MARKETABILITY UNPROVEN EXCEPT FOR PAPER STUDIES
- MANUFACTURERS HEAVILY CAPITAL COMMITTED, UNWILLING TO RISK PRODUCTION CAPITAL WITHOUT FIRM ORDERS
- OPERATORS UNCERTAIN ABOUT PROFITABILITY AND AVAILABILITY OF LANDING SITES
- LOCAL COMMUNITIES WILL NOT COMMIT TO AVIATION LAND USE WITH (OPERATOR, EQUIP, ENVIRONMENT)

FEASIBILITY (CONT.)

- ANALYTICAL STUDIES HAVE CITED VAST POTENTIAL OF V/STOL SHORT HAUL
 - CARD POLICY STUDY
 - CAB MEC VTOL INVESTIGATION
 - NORTHEAST CORRIDOR PROJECT
 - WESTERN CONFERENCE
- BUT QUESTION OF SOCIAL & POLITICAL ACCEPTANCE REMAINS
- STATE OF THE ART TECHNOLOGY CAN PROVIDE FOR MODEST SYSTEM DEMONSTRATION
 - BENEFIT OF DEMONSTRATION
 - CAPITAL INVESTMENTS MINIMIZED
 - REAL DATA TO GUIDE R&D AND SYSTEM PLANNING FOR BOTH PUBLIC & PRIVATE SECTORS
 - RISKS OF DEMONSTRATION
 - MODEST BEGINNING COULD RESULT IN WRONG CONCLUSIONS
 - PUBLIC OPPOSITION COULD HARDEN AGAINST A LESS THAN OPTIMUM V/STOL SYSTEM

DEMONSTRATION PROGRAM DEVELOPMENT

- ANALYTICAL STUDIES HAVE NOT RESOLVED MARKET UNCERTAINTIES
- PROGRAMS WOULD INCITE INDUSTRY EFFORTS BY VISIBLE SIGNS OF FEDERAL INTEREST
- COMMUTER AIR CARRIERS HAVE EQUIPMENT, ORGANIZATION AND INTEREST IN SHORT HALL MARKET
- BETTER THAN 4 MILLION PASSENGERS LAST YEAR
- REDUCE UNCERTAINTIES IN R & D PROGRAM TO DETERMINE SYSTEM APPLICABILITY & INVESTMENT IN
 - AIR TRAFFIC CONTROL
 - NAVIGATION AND COMMUNICATION
 - VEHICLE TECHNOLOGY
 - ENVIRONMENTAL ACCEPTABILITY

DEMONSTRATION PROGRAM (PROTOTYPE)

- ESTIMATED TOTAL PROGRAM COST - \$130 MILLION
 - FEDERAL SHARE - \$30 MILLION
 - INDUSTRY SHARE - \$100 MILLION
- MAJOR INDUSTRY COST IS VEHICLES - \$75 MILLION
 - WILL ONLY OCCUR IF OPERATOR HAS REASONABLE INVESTMENT PROTECTION THROUGH : ROUTE PROTECTION, LOAN GUARANTEES, OR JOINT AGREEMENTS WITH TRUNKS
- MAJOR FEDERAL SHARE IN LANDING FACILITIES - LOCAL COMMUNITIES SUPPLY MATCHING FUNDS
 - NEW STOLPORTS - \$9.5 MILLION
 - STOLSTRIPS - \$.25 MILLION
 - AIRPORT MODIFICATIONS - \$1.0 MILLION
- RISKS : LOCAL COMMUNITIES MAY NOT SUPPORT DUE TO FINANCIAL CAPABILITY OR SOCIAL OPPOSITION

DEMONSTRATION PROGRAM ("PRODUCTION")

• WHO RUNS IT?

- COMMUTER AIR CARRIER INDUSTRY
- LOCAL COMMUNITIES

• WHERE (EXAMPLES)

- INTER/INTRA-URBAN NEC (BOSTON - NEW YORK)
- CBD TO CBD - FAR WEST (SEATTLE - PORTLAND)
- RECREATIONAL - FEEDER (DENVER - VAIL)

• MANAGEMENT

- DOT/FAA V/STOL SPECIAL PROJECTS OFFICE
SYSTEM DEVELOPMENT, PLANNING, REQUIREMENTS
- NASA - VEHICLE TECHNOLOGY REQUIREMENTS
- CAB - SYSTEM & ECONOMIC REGULATION & REQUIREMENTS

• DEVELOPMENT SCHEDULE

- FY 1972 - SITE SELECTIONS FOR DEMONSTRATION
- FY 1973 - DEMO PLANNING, SITE CONSTRUCTION, EQUIPT BUY
- FY 1973-75 - DEMONSTRATIONS

SUMMARY

- TOTAL POTENTIAL IS MULTI-BILLION DOLLAR SYSTEM DEVELOPMENT PROGRAM - FINANCED MOSTLY WITH PRIVATE CAPITAL
- POTENTIAL \$1.75 BILLION INCREASE IN GNP
- POTENTIAL 650,000 JOBS
- POTENTIAL \$1.1 BILLION FAVORABLE BALANCE OF TRADE
- DEMONSTRATIONS WILL TEST SOCIAL/POLITICAL AND ECONOMIC UNCERTAINTIES NOW DELAYING SYSTEM DEVELOPMENT
 - DEMONSTRATION - COSTS \$130 MILLION
 - FEDERAL - \$30 MILLION
 - INDUSTRY - \$100 MILLION
- REGULATORY INCENTIVES OR FINANCIAL PROTECTION WILL BE REQUIRED TO ASSURE INDUSTRY PARTICIPATION

THE WHITE HOUSE

WASHINGTON

July 1, 1971

ADMINISTRATIVELY CONFIDENTIAL

MEMORANDUM FOR

Secretary of Defense
Secretary of Agriculture
Secretary of the Interior
Secretary of Commerce
Secretary of Health, Education and Welfare
Secretary of Housing and Urban Development
Secretary of Transportation
Director, Office of Management and Budget
Administrator, National Aeronautics and Space
Administration
Administrator, Environmental Protection Agency
Chairman, Council on Environmental Quality
Chairman, Council of Economic Advisers
~~Director, National Science Foundation~~
Director, Office of Science and Technology
Executive Director, Council on International
Economic Policy

SUBJECT: Domestic Council Study - Evaluation of New Technology
Opportunities

The President has directed the Domestic Council to study new technology opportunities in the civilian sector. These opportunities might include stepped up programs (federal, private or mixed) in areas such as desalinization of water, advanced energy systems, low pollution automobiles, solid waste recycling, new teaching methods, health care, new housing construction or repair technology, oceanographic exploration, and so on. The objective is to stimulate innovation in the civilian sector of the economy directed at basic national problems and/or economic opportunities; that is, to accelerate so-called change of national priorities. A side benefit of this program may be to bring the aerospace unemployed into the mainstream of technology.

The study should apply these basic criteria to each technology project or program before any increased funding is recommended to the President.

1. Importance: Project or program must relate (a) to a significant and urgent national problem which is broadly recognized by the public, or (b) to a significant opportunity for economic growth, increased exports, or technological leadership.

2. Pay Off: The cost/benefit ratio must be favorable. What are the social and economic benefits - including impact on balance of trade, productivity and employment? What will be the distribution of benefits among different industries and areas of the country?

3. Public Impact: Can visible progress be shown within a reasonable period - including significant progress in planning and design by next summer? A timetable must be provided by fiscal year for each phase of development: planning, design, pilot, demonstration, etc.

4. Budget Impact: What are estimated long-term costs over next six years or full systems cost?

5. Non-Federal Support: What is the feasibility and likely maximum extent of cost sharing by industry? Can the project be achieved through steps short of direct Federal funding: regulation or de-regulation, standard setting?

6. Potential Problems: Are there potential institutional or economic barriers to acceptance and implementation of the technology and how are they to be overcome? Are there any undesirable side effects from the technology and how are they to be dealt with?

7. Organization and Management: Assuming several programs or projects meet the above criteria, what kind of organization (existing agencies, new agency, or quasi-public corporation) should be created (if any) or redirected to carry out these programs?

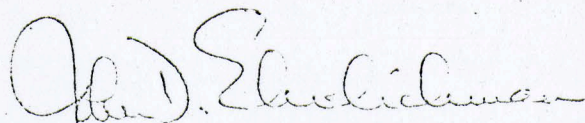
The study should have two phases: (1) an interim report due the President September 1, and (2) a final report due the President November 15.

Dr. Edward David, the Director of the Office of Science and Technology and the President's Science Adviser, will chair the sub-committee and John Whitaker will have Domestic Council staff responsibility.

ADMINISTRATIVELY CONFIDENTIAL

We will be contacting you shortly on whom you elect to represent you at the staff level. A suggested list follows for your confirmation or substitution of another individual:

Department of Defense: Dr. Gardiner Tucker
Department of Transportation: Dr. Robert Cannon.
Department of Commerce: Dr. Lewis Branscomb
Department of Agriculture: Dr. Ned Bayley
Department of the Interior: Dr. Elburt Osborn
Department of Health, Education and Welfare:
Dr. Merlin DuVal
Department of Housing and Urban Development: Dr. Harold Finger
NASA: Dr. George Low
Office of Management and Budget: Dr. Donald Rice
Environmental Protection Agency: Dr. Stanley Greenfield
Atomic Energy Commission: Commissioner Wilfred Johnson
Council on Environmental Quality: Dr. Gordon MacDonald
National Science Foundation: Dr. Raymond Bisplinghoff
Council of Economic Advisers: Mr. Herbert Stein
Office of Economic Opportunity: Dr. John Wilson



John D. Ehrlichman
Assistant to the President
for Domestic Affairs

ADMINISTRATIVELY CONFIDENTIAL

1 September 1971

Mr. V.J. Adduci
President
Electronics Industry Association
2001 Eye Street, N.W.
Washington, D.C. 20006

Dear Mr. Adduci:

I am writing to you on behalf of the President's Domestic Council to solicit the views of your organization, or even individual views, with respect to potential new technology opportunities in the civilian sector and how the federal government might stimulate these potential opportunities. Generally, these programs might include stepped up efforts (federal, private, or both) in areas such as desalinization of water, advanced energy systems, low pollution automobiles, solid waste recycling, new teaching methods, new health care methods, new housing construction, oceanographic exploration, means for increasing industrial productivity, transportation systems, new law enforcement methods, and so on. The objective is to stimulate innovation in the civilian sector of the economy directed at basic national problems and/or economic opportunities.

The study should apply at least these basic criteria to each technology project or program before any increased funding is recommended:

1. Importance: Project or program must relate (a) to a significant and urgent national problem, or (b) to a significant opportunity for economic growth, increased exports, or technological leadership.
2. Pay Off: The cost/benefit ratio must be favorable. What are the social and economic benefits - including impact on balance of trade productivity and employment? What will be the distribution of benefits among different industries and areas of the country?
3. Budget Impact: What are estimated long-term costs over next six years or full systems cost?

4. Non-Federal Support: What is the feasibility and likely maximum extent of cost sharing by industry? Can the project be achieved through steps short of direct Federal funding: regulation or de-regulation, standard setting?

5. Potential Problems: Are there potential institutional or economic barriers to acceptance and implementation of the technology and how are they to be overcome? Are there any undesirable side effects from the technology and how are they to be dealt with?

6. Organization and Management: Assuming several programs or projects meet the above criteria, what kind of organization (existing agencies, new agency, or quasi-public corporation) should be created (if any) or redirected to carry out these programs?

A second area wherein I seek your counsel relates to potential stimulus that could be offered to industry in order to create innovation, higher productivity, etc. by revision of tax laws, grants, prizes, etc.

A third area about which I would appreciate your ideas concerns potential changes in anti-trust and patent law practices to encourage innovation, higher productivity, improved export business and greater overall employment.

Our inside government review of these same questions will be under study during the month of September; therefore, if I could have your response by 27 September, it could serve a most useful purpose.

Sincerely,

W.M. Magruder
Special Counsel to the Domestic Council
The White House

Please send reply to:
800 Independence Ave., S.W.
Washington D.C. 20590

Attn: SS-1, Room 900W

NOTE: Identical letters sent attached list of addressees

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Lexington, Mass. 02173

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President
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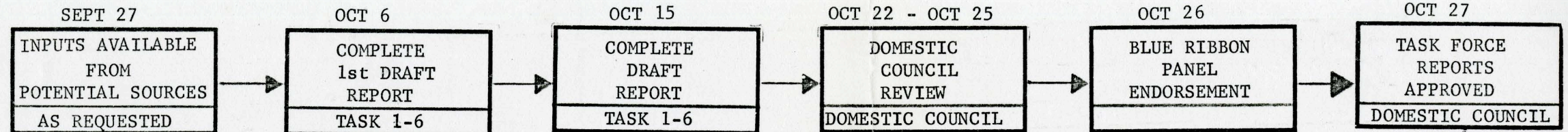
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Washington, D. C. 20005

AILES, Stephen
President
Association of American Railroads
American Railroads Building
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Washington, D. C. 20036

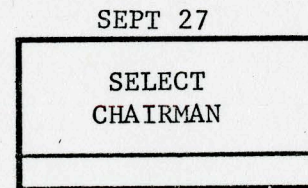
ADDUCI, V. J.
President
Electronics Industry Association
2001 Eye Street, N. W.
Washington, D. C. 20006

FLOW DIAGRAM - IMPLEMENTATION OF NEW TECHNOLOGY OPPORTUNITIES

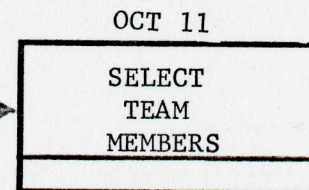
MAJOR EVENTS



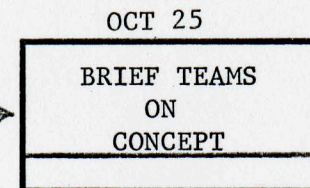
ACADEMIC
TEAM



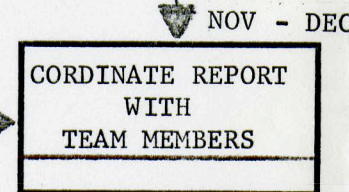
LABOR
TEAM



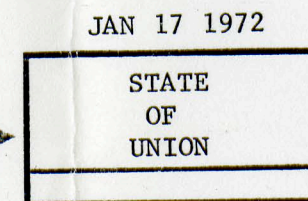
INDUSTRY
TEAM



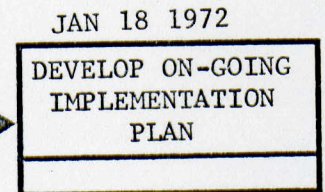
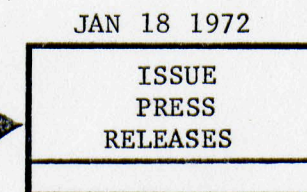
ECONOMIST
TEAM



BUSINESS
TEAM



PRESS
TEAM



THE NEED FOR A
STRATEGIC APPROACH TO U. S. R&D

THE "PROBLEM"

The U. S. has problems in:

- Industrial productivity
- International trade
- Domestic affairs
- Employment opportunities

The U. S. also has:

- R & D resources

Can R & D be marshalled to help solve these problems?

WHAT IS BEING DONE ?

● DOMESTIC COUNCIL STUDY OF NEW TECHNOLOGICAL OPPORTUNITIES

● 15 Departments and Agencies

● Criteria

- Relate to urgent national problems
- Favorable cost/benefit ratio
- Public impact
- Budget impact
- Non-Federal support feasibility
- Problems
- Management

● OBJECTIVE: Stimulate civil sector of economy directed at national problems and/or opportunities

● TASK FORCE ON TECHNOLOGY TRANSFER ABROAD

● TASK FORCE ON R & D INCENTIVES

● TASK FORCE ON ANTI-TRUST AND PATENT POLICIES

● TASK FORCE ON STANDARD PRACTICES

● TASK FORCE ON RESTRICTIVE LABOR PRACTICES

TASK FORCES ASSIGNED

TASK NO

TASK DESCRIPTION

CHAIRMAN

1

NEW TECHNOLOGY OPPORTUNITIES

DR. L. GOLDMUNTZ

2

TECHNICAL R&D INCENTIVES

D. RICE

3

ANTI-TRUST AND PATENT POLICIES

L. ENGMAN

4

STANDARD PRACTICES

J. LOKEN

5

RESTRICTIVE LABOR PRACTICES

E. MORGAN

6

TECHNOLOGY TRANSFER ABROAD

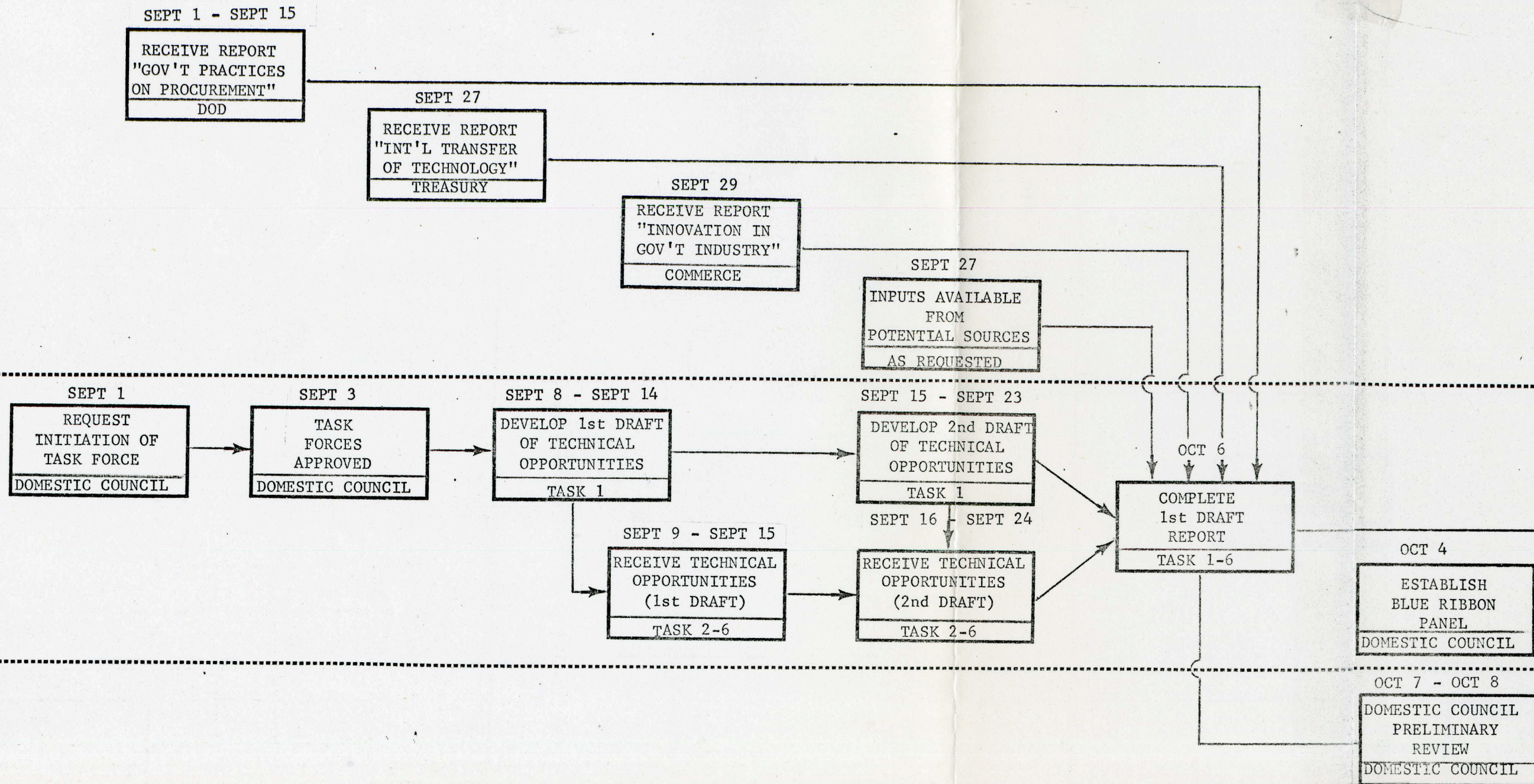
J. PETTY

FLOW DIAGRAM - NEW TECHNOLOGY OPPORTUNITIES

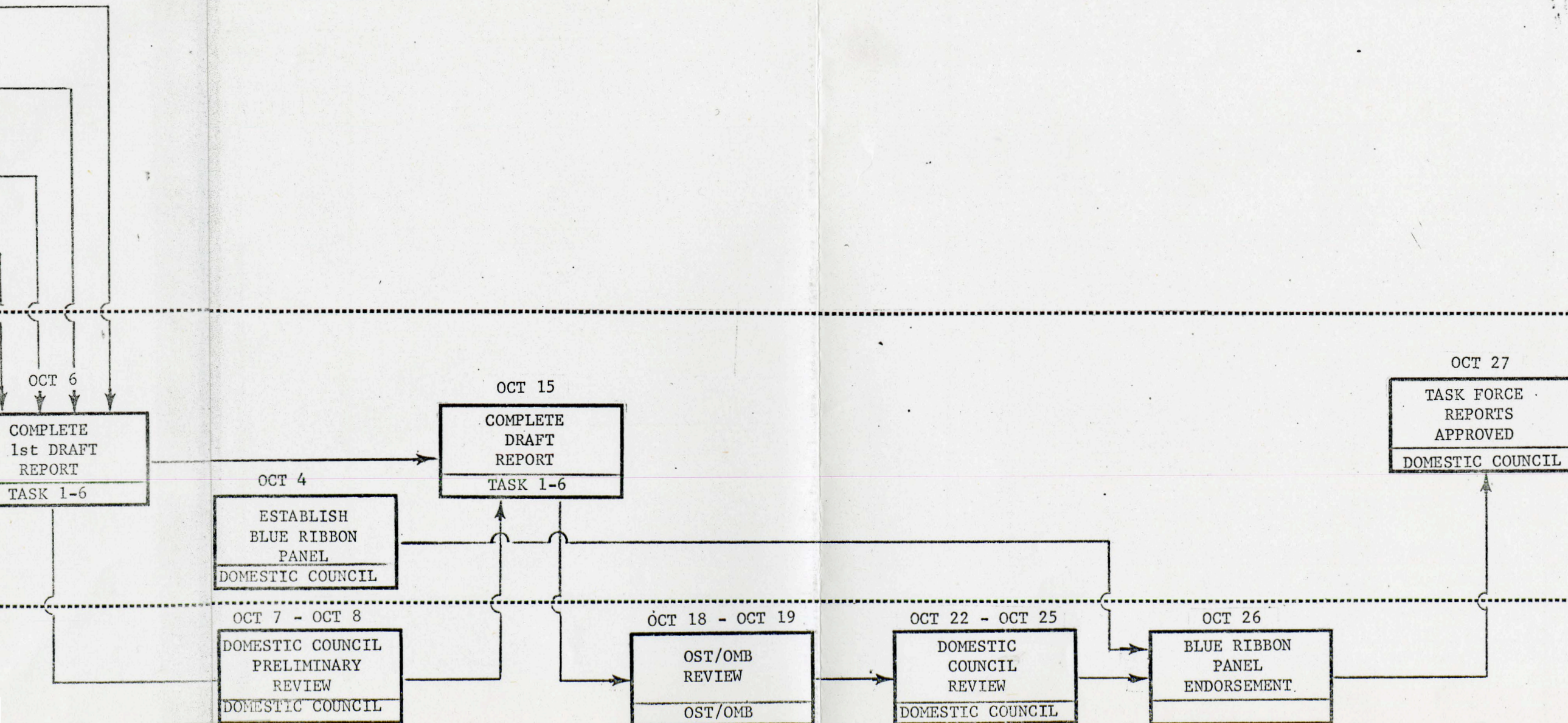
MAJOR INPUTS

TASK FORCE DEVELOPMENT

REVIEWS



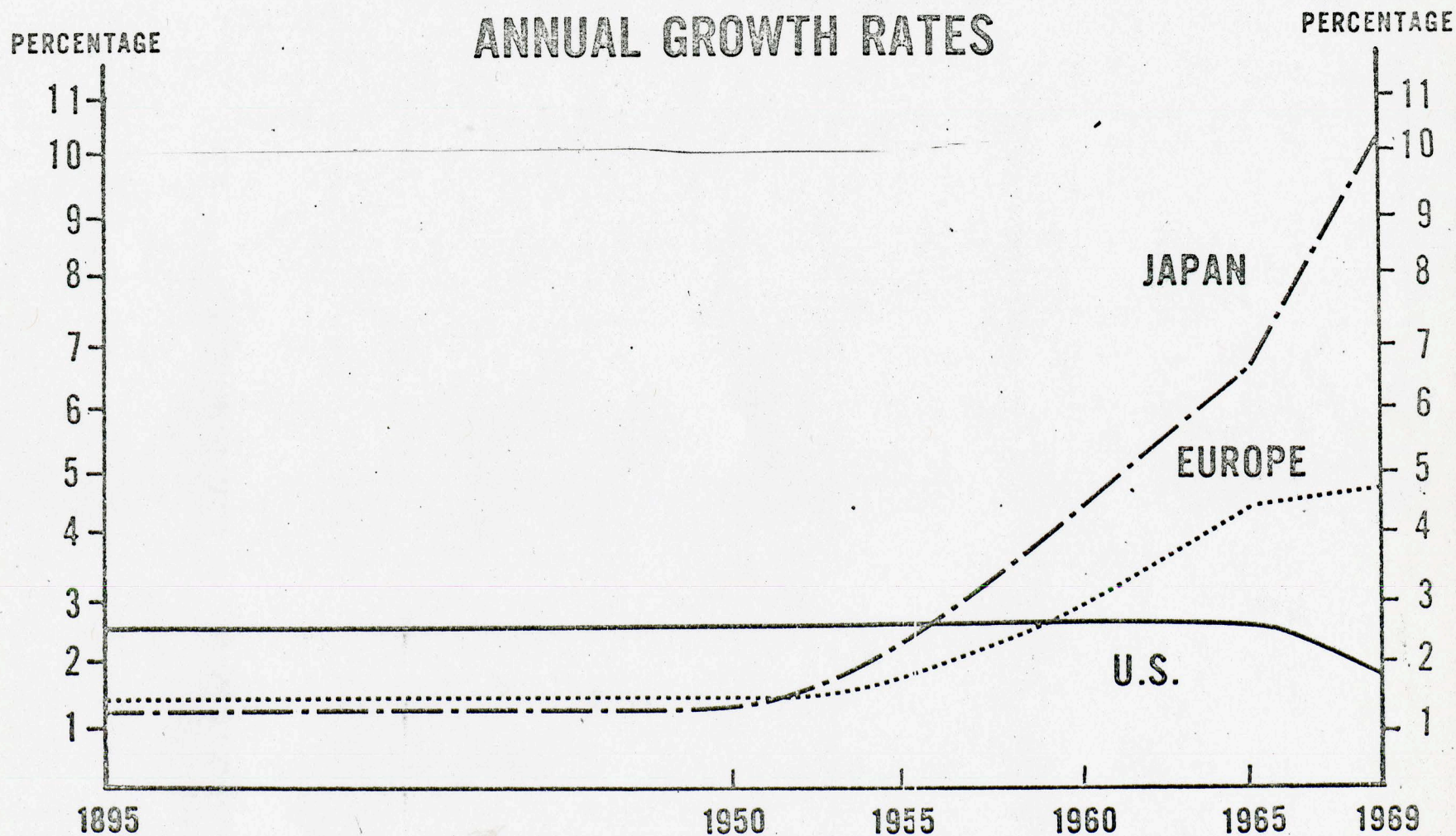
TUNITIES



EVIDENCE OF THE EROSION OF U.S. TECHNOLOGY FOCUS

- Productivity Trend
- Trade Surplus Trends
- Examples of Export Penetration of U. S. Markets
- Relationship between R & D and economic growth
- R & D spending Trend: Civilian and Federal

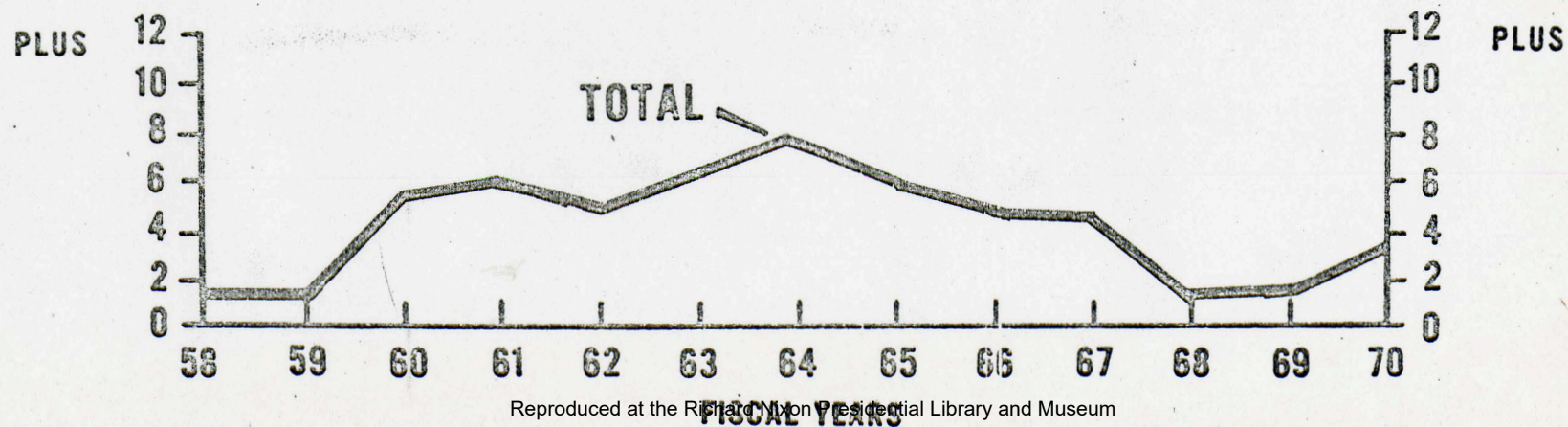
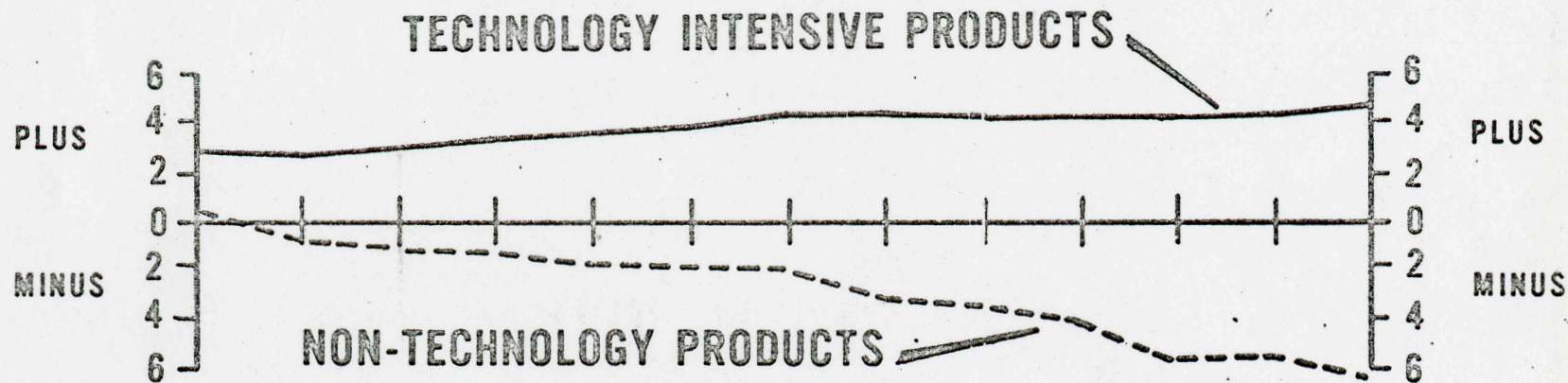
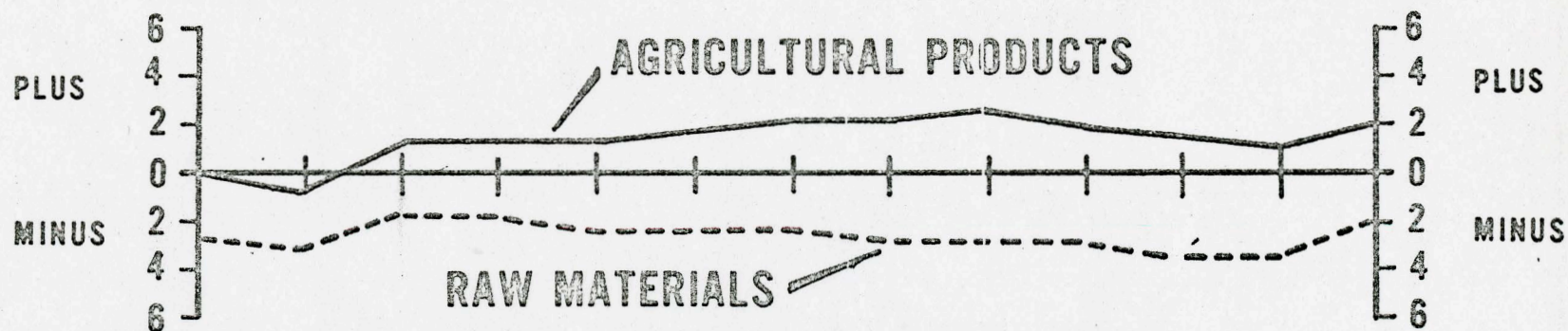
COMPARATIVE PRODUCTIVITY ANNUAL GROWTH RATES



NOTE: Productivity = Real GNP/total labor manhours

TRADE BALANCE TRENDS

\$ BILLIONS



RELATIONSHIP OF R&D TO ECONOMIC GROWTH AND TRADE

- Industries that invest heavily in R & D (3-4 % sales) tend to:
 - show larger productivity increases
 - grow faster
 - sell in international markets

Examples:

- aircraft, electronics, instruments, computers, chemicals

- Industries that have low R & D investment (1%) tend to show:
 - low productivity
 - low growth
 - trade deficits

Examples:

- textiles, footwear, basic metals, wood products, food products

EXPORT PENETRATION OF U. S. MARKET

CIVIL AIRCRAFT

- 1955-1960 U. S. Dominated Free World Market
- 1960-1970
 - U.K. and France Cooperate on Concorde - 1960
 - Canada, U.K., France and Italy require "Off-Set" Agreements - 1963
 - Canada builds wing and tail of DC-9 - 1964
 - Italy builds fuselage panels of DC-9 - 1964
 - Seven nations build F-104 under license with Lockheed - 1963
 - Rolls Royce Engine on Lockheed L-1011 - 1968
 - A-300B built by France, Germany, Britain and Holland - 1969
 - Mercure built by France, Germany, Belgium, Switzerland, Spain and Italy - 1969
 - Falcon 20T built by France - 1969
- 1971 Boeing signs joint agreement with Italy STOL civil transport
- 1971 Japan signs joint agreement with ??? wide body airbus

RESULT:

- U. S. Market could go from 85% to 45% in 1970's
- Civil aircraft employment could $\approx$ 500,000
- Export trade could decrease 2-3 billion per year

EXPORT PENETRATION OF U. S. MARKET

TEXTILE MACHINERY

- 1955-1965 almost half billion U. S. trade surplus
- 1965 - present
 - rapid expansion of U. S. textile industry in early 60's caused long delivery lag of new textile machinery in U. S. and abroad
 - Foreign textile manufacturers turned to Europe and Japan for modern machinery
 - Foreign machinery sales expanded in U. S., Europe and Japan
 - As foreign manufacturing increased, foreign R & D increased
 - As U. S. profits declined and costs rose, U. S. R & D declined
 - U. S. commercial banks reluctant to meet terms offered by foreign banks
 - U. S. Government reluctant to expand world production by financing U. S. textile machinery sales (no world textile shortage)
 - Ex-Im Bank trying to match foreign terms
 - Foreign Governments not reluctant to offer liberal financing or even subsidies

RESULT

- U. S. trade imbalance in textile supplies and materials near \$1 billion
- U. S. companies offering offshore licenses and considering curtailing U. S. production

EXPORT PENETRATION OF U. S. MARKET

MACHINE TOOLS

- Favorable trade balance for industrial machinery more than doubled since 1960
- 1970
 - U. S. lead due to sophistication of machinery
 - Foreign technology and pricing eroding U. S. lead
 - Imports increased by a factor of four 1963 - 1967 in \$ value
 - 1970 U. S. imported 53,800 machines and exported 40,300
 - Since 1967, value of U. S. production dropped from \$1.87 billion to \$1.1 billion in 1971
 - Key areas affected: Boring, Drilling, Milling Machines and Lathes
Defense implications: U. S. cannot rely upon foreign suppliers
 - Some U. S. companies already forced out of this business
 - In mid-50's, U. S. companies in overseas production because of U. S. costs
 - 1971 - All 50 major U. S. manufacturers have overseas plants or licensees
 - Foreign manufacturers receive tax rebates, refunds and exemptions to stimulate exports

RESULT

- The trade balance presently apparent could be misleading
- Imports growing, in terms of machines, faster than exports
- U. S. manufacturers exporting expertise abroad

EXPORT PENETRATION OF U. S. MARKET

COMMUNICATIONS - ELECTRONICS

- From 1960 - 1970 U. S. industry produced an average favorable trade balance of about \$500 million yearly
- 1971
 - Consumer electronics moved to a negative trade balance of \$1 billion in 1970
 - Lack of technology change allows foreign price/cost advantage
 - In 1969 Japan supplied 54% of TV and 69% of radio imports to Free World
 - 25% of all electronic components made in U. S. are used in consumer products
 - 10% of radios sold in U. S. and U. S. built; TV sales down 22%, imports up 180%
 - Foreign manufacturers receive government export stimulation

RESULT

- U. S. costs forcing manufacturers to license and move production technology abroad
- U. S. employment has declined 107,000 from 1969 peak of 1,083,000
- In high technology electronics area (integrated circuits and computer equipment)

Balance of trade up from \$157 million in 1965 to \$482 in 1970. U. S. employment increased 40,000

EXPORT PENETRATION OF U. S. MARKET

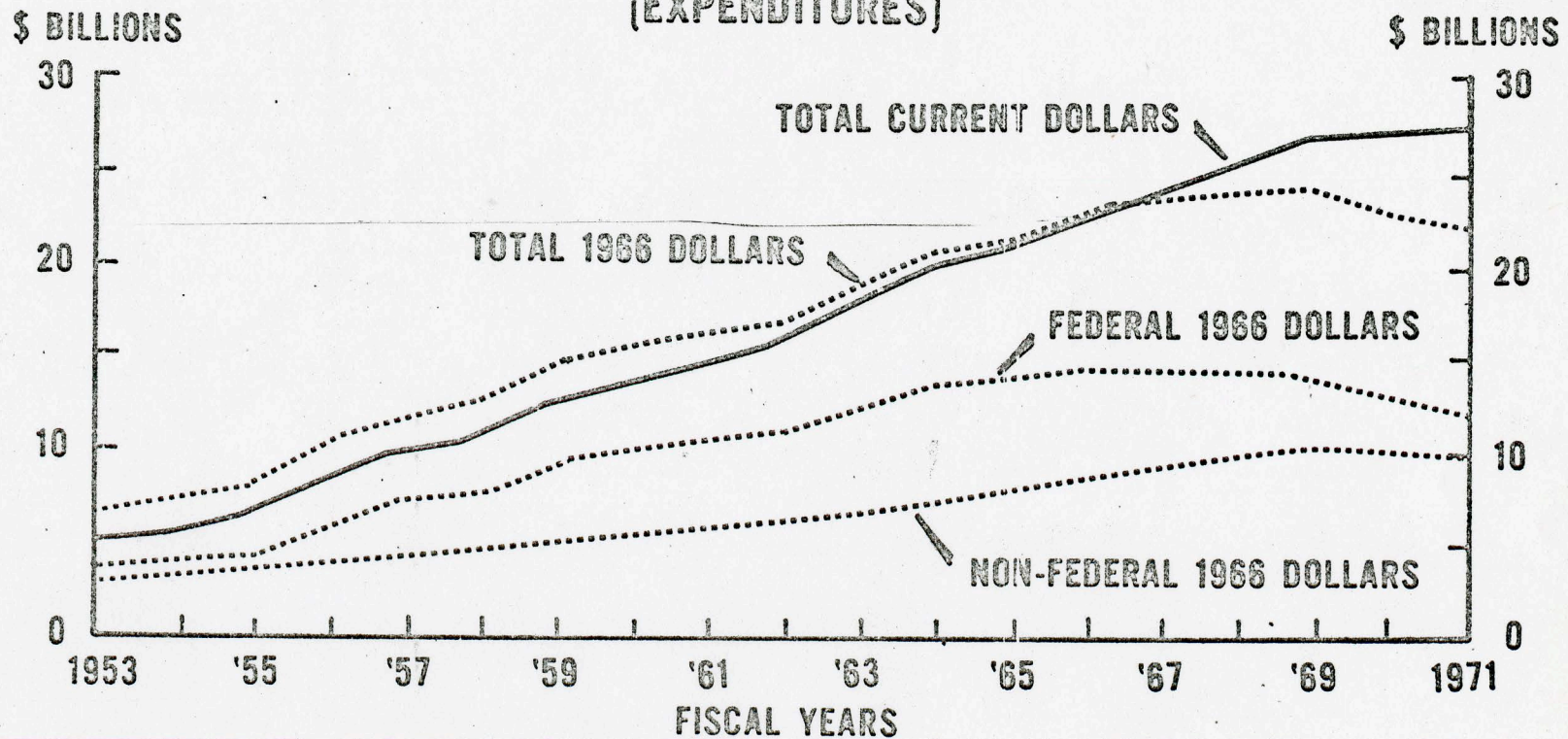
STEEL

- Until 1959, the U. S. was a net steel exporter
- 1970
 - Imports from one million tons in 1955 to 18 million tons in 1968 -- 1% to 17% of U. S. market
 - No U. S. productivity increase since 1965
 - Foreign productivity improved since 1960 by a factor of 2 to 4
 - Japan doubled its output since 1965, now principal foreign steel supplier to U. S.
 - Number of countries producing steel (70) more than twice 1946 level
 - Foreign governments provide low interest loans, stimuli for mergers, and export prices below domestic to stimulate exports

RESULT

- Little or no growth in U. S. steel output since 1965
- Overall U. S. steel technological advantage shrinking
- Imports increasing in the higher value items (54% in sheet, 107% in pipe, and 35% in stainless steel since 1965)

R&D FUNDING TRENDS (EXPENDITURES)



- Total R&D leveling off in dollars and dropping in level of effort
- Federal R&D decreasing faster than non-Federal R&D

MAJOR INFLUENCES

- Decline of aerospace/defense
- Inflation
- Economic situation
- 1972 outlook: Federal level of effort dropping and non-Federal leveling off
- Increased R&D in 1972 budget, if continued in FY 1973, will raise Federal spending \$1 billion in '73

TOTAL U.S. R&D EMPHASIS

		Fiscal Year	
		<u>1968</u>	<u>1972</u>
●	<u>Total expenditures (\$ Billions)</u>		
●	Federal:		
	Defense	\$ 8.0	\$ 7.7
	Space	4.6	3.1
	Other	3.7	4.6
	Total Federal	<u>\$ 16.3</u>	<u>\$ 15.4</u>
●	Non-federal:		
	Industry	\$ 8.9	\$ 10.5 ± 0.5
	University and non-profit	1.3	1.5
	Total non-federal	<u>\$ 10.2</u>	<u>\$ 12.0 ± 0.5</u>
	GRAND TOTAL	<u><u>\$ 26.5</u></u>	<u><u>\$ 27.4 ± 0.5</u></u>

● Performance and Funding (FY 72)

	<u>Federal</u>	<u>Industry</u>	<u>Universities & Non-Profit</u>
● % Performed	15	70	15
● % Funded	57	38	5

TOTAL U. S. R & D EMPHASIS

Concentration of R & D Performance

- Four companies spend 20% of manufacturing R & D
- Forty companies spend 70%
- Aerospace and electronics spend 55%
- Machinery, chemicals and motor vehicles spend 30%

Summary

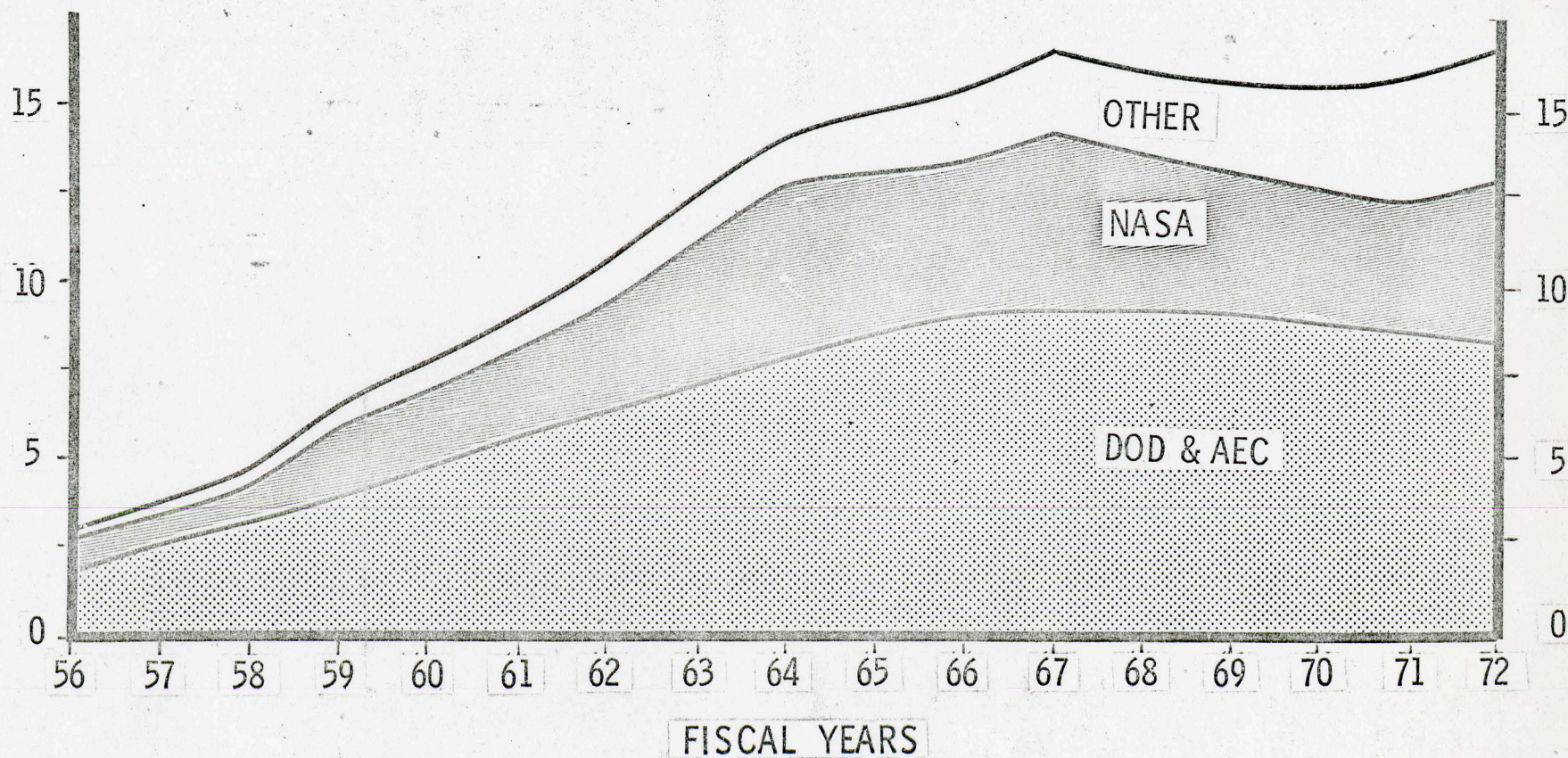
- Total U. S. R & D down 10-5% in real terms from 1968 to 1972
 - Federal down 20% in real terms
 - Non-federal down 0-7% in real terms
- U. S. R & D highly concentrated in defense and space industries and agencies

FEDERAL R&D OBLIGATIONS BY AGENCY

1966 DOLLARS

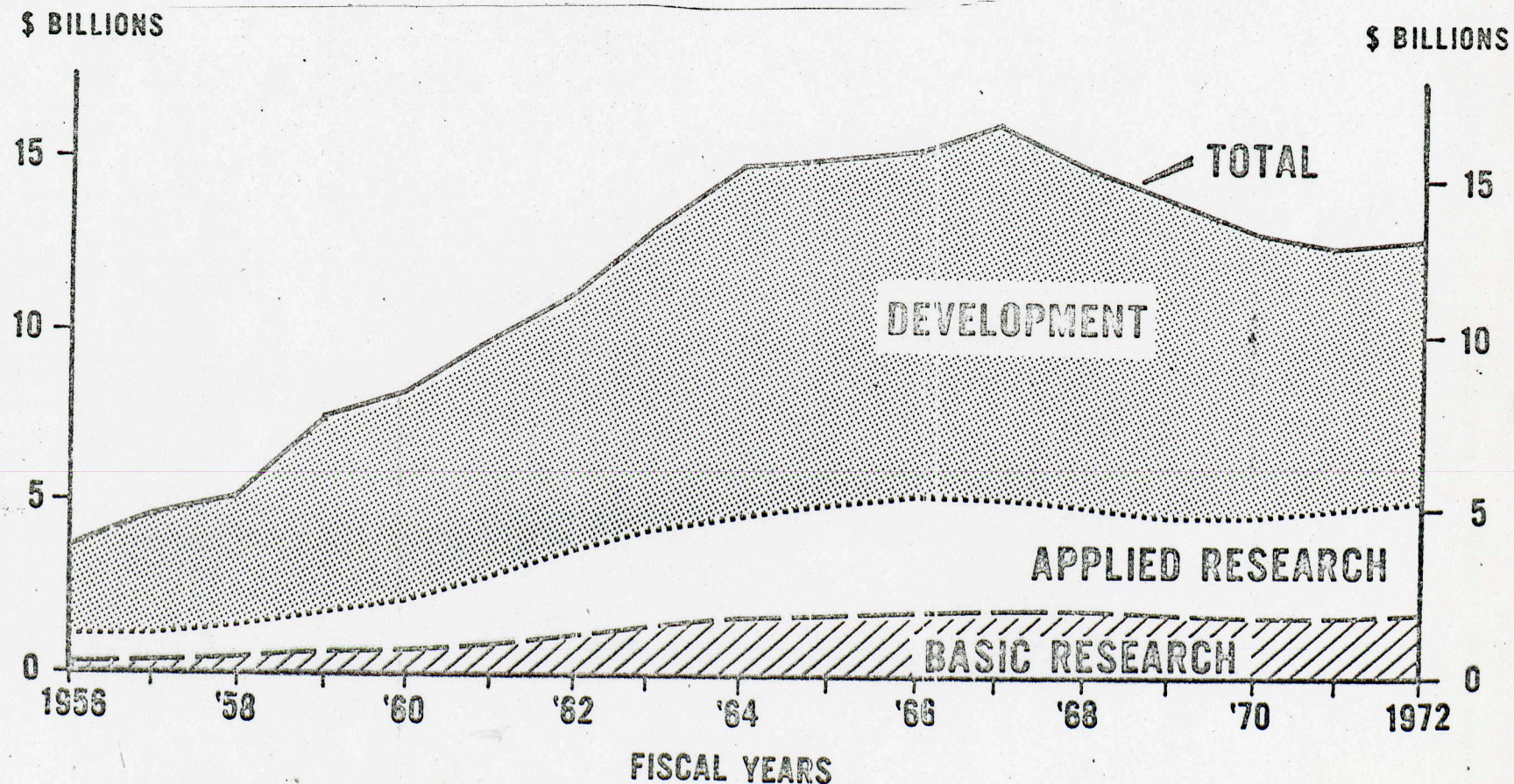
\$ in
Billions

\$ in
Billions

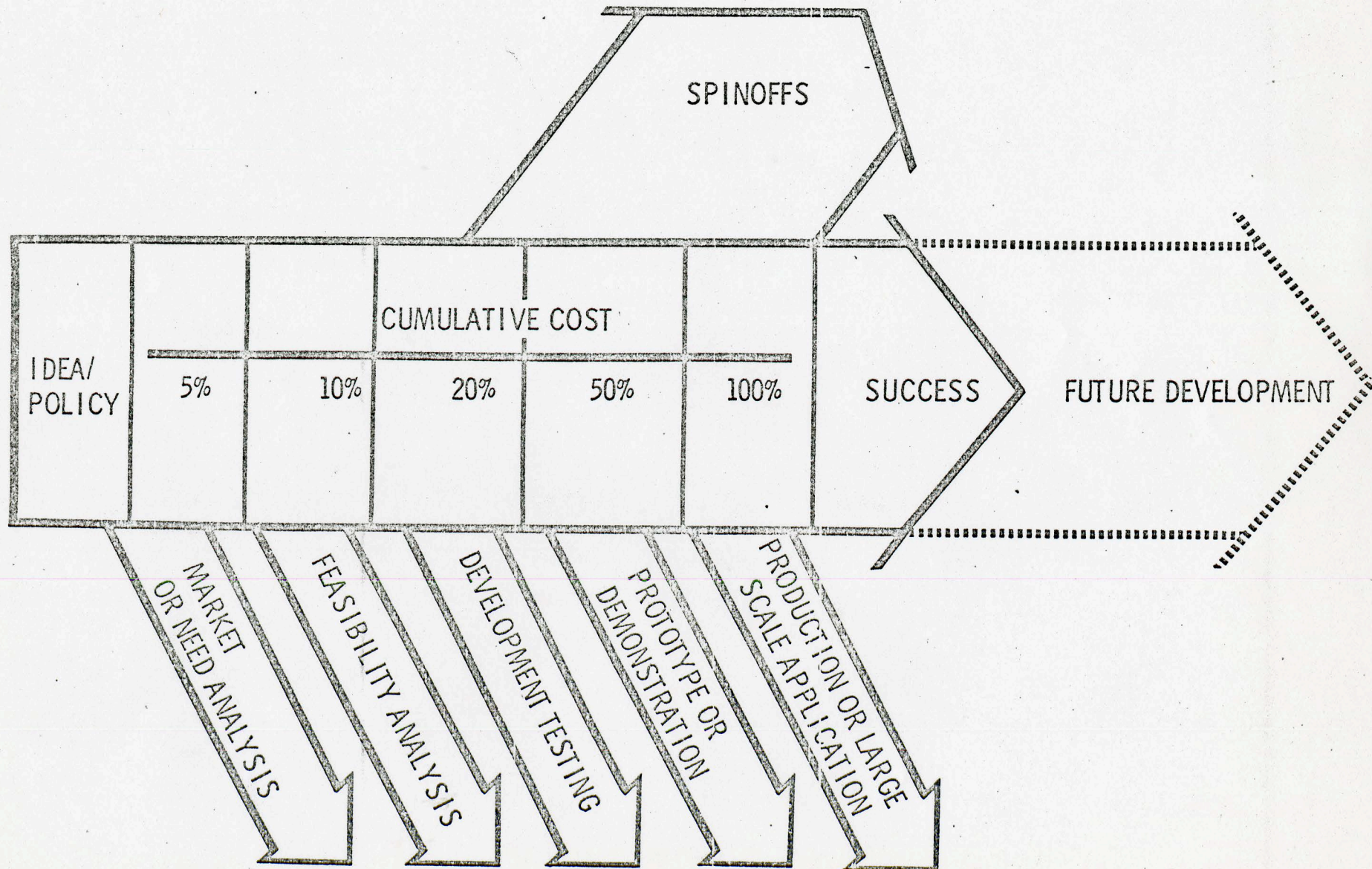


FEDERAL R&D OBLIGATIONS BY ACTIVITY - 1966 DOLLARS

(BASIC RESEARCH, APPLIED RESEARCH, AND DEVELOPMENT)



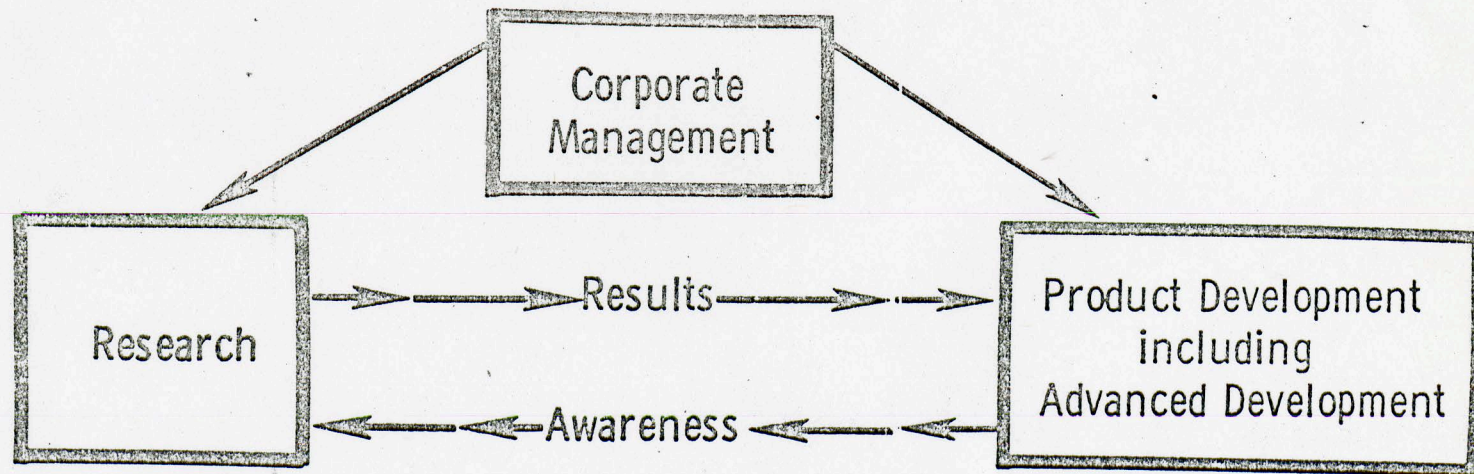
CURRENT PATTERN OF MANAGEMENT: R&D PROGRESSION



CURRENT PATTERN OF MANAGEMENT

LARGE COMPANY APPROACH - Bell System and IBM

R & D closely coupled to firm's objectives, but not too constrained to immediate or narrow problems.



CURRENT PATTERN OF R & D MANAGEMENT

EXECUTIVE BRANCH

- Budget Process
 - OST Technical evaluation and recommendations
 - Ad Hoc Inter-Agency Reviews and Recommendations
 - Departmental and Agency review and recommendations
- Concerns About R & D Management Process
 - Lack of clear policies that can translate readily into R & D objectives
 - Lack of clear measures of cost/benefit ratio
 - Emphasis upon domestic welfare, foreign trade and foreign policy minimal compared to Defense and Space
 - Inability to effectively alter large on-going R & D

POTENTIAL FEDERAL MANAGEMENT ACTIONS

- Leave R & D Management "as is "
- Strengthen civilian agencies
- " New NASA " -- new responsibilities for an existing high technology agency
- Strengthen Executive Office of the President
- Commerce Department Technology Enhancement Program

POTENTIAL R&D STIMULI

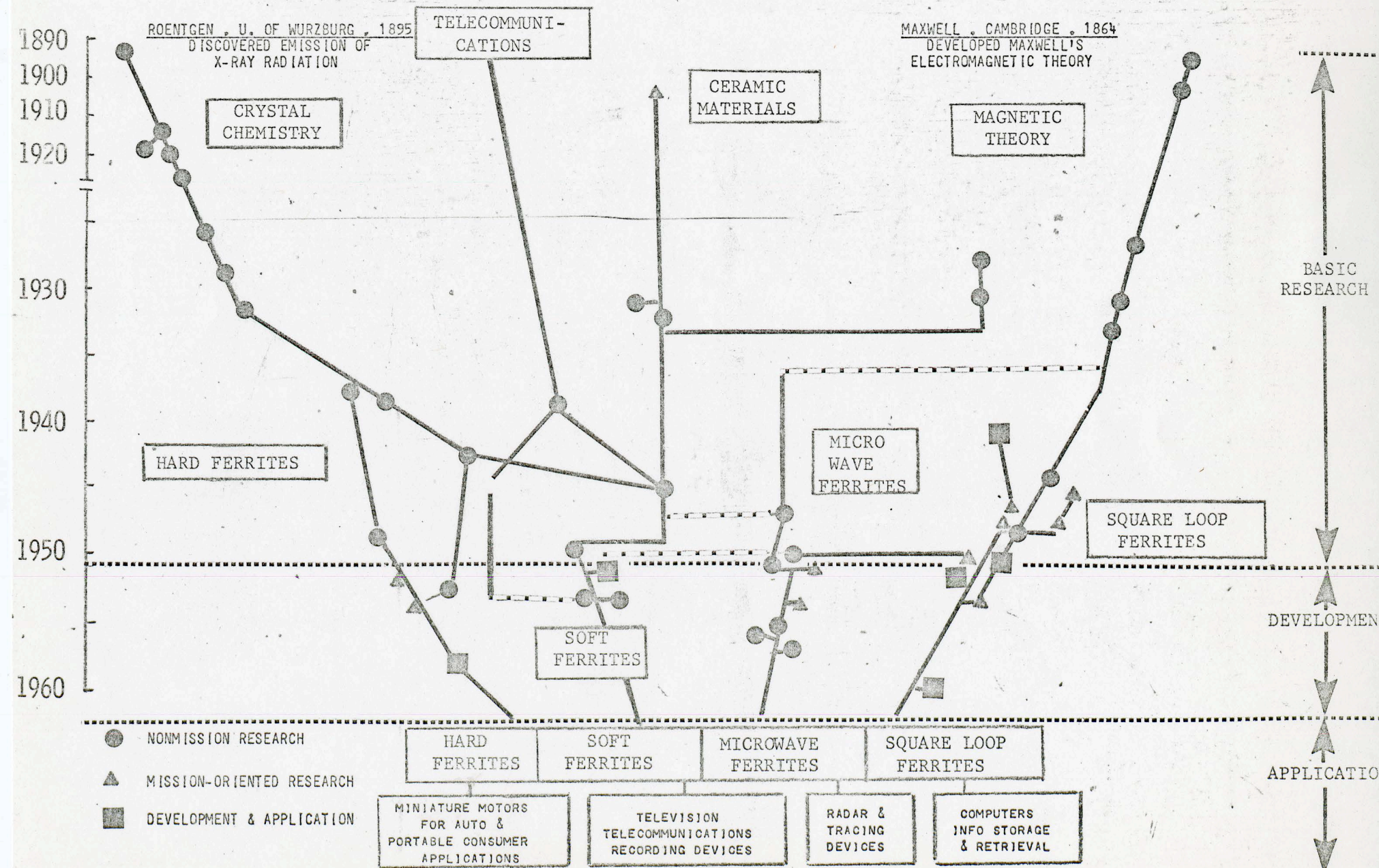
● General Stimulation

- Tax credit, e.g., 5% tax credit for company R&D -- Cost about \$600 million.
- Anti-trust and patent law changes.
- Awards and prizes to companies and individuals.

● Targeted Stimulation

- Matching grants to selected industries or industrial associations. -- (under study).
- R&D loan bank for specific technology programs with Government receiving royalties on profitable ventures.
- Conduct of R&D by Federal Government through "proof of concept." Turn over to private industry through competitive bids.
- Quasi-public R&D corporations in specific fields. Auction off results.
- Federal regulatory practices, e.g., auto pollution.
- Use of governmental purchasing power to stimulate initial markets for new products, e.g., guaranteed purchase of so many pollution-free automobiles.
- Tax credit for company support of selected university research.

THE DEVELOPMENT OF MAGNETIC FERRITES



PROTECTING OUR LEAD IN AERONAUTICAL TECHNOLOGY

- Develop quiet engines for STOL, subsonic and supersonic aircrafts.
- Accelerate the STOL demonstration.
- Develop advanced subsonic, supersonic, and/or hypersonic transport technologies.

TRANSPORTATION TECHNOLOGIES THAT REDUCE COST AND CONGESTION

● PERSONAL TRANSPORTATION:

- Personal vehicles capable of operation on and off a guideway (capacity and service improvements at lower cost)
- Bus and rail corridor development for high speed service
- Automatic techniques to improve highway capacity
- Tunnelling technology

● INTERCITY TRANSPORTATION:

- Computer controlled freight car and truck movements
- Automated highways

● AIR TRAVEL:

- Advanced schedule for Air Traffic Control Improvement
- Develop high-capacity, low-noise airports using advanced beacons and radar

● OCEAN TRANSPORTATION:

- Deep water port facilities for large ships
- Ship automation
- Nuclear propulsion for new large ships

EFFECTIVE UTILIZATION OF U. S. NATURAL RESOURCES

- Water Resources (Interior)
 - Demonstration of Regional Water Resources -- water recycling, Susquehanna River
 - Dual purpose Nuclear Power/Desalting Plant -- 100 million gallons/day, Southern California
 - Integrated Estuary Management Demonstration -- waste control, Galveston or San Francisco
- Ocean and Weather Resources (NOAA)
 - Weather modification
 - Mariculture
 - Marine Mineral Exploitation - Continental Shelf

- Mineral Resources (Interior)
 - Secondary Recovery of Oil
 - Reduction of Acid Mine Drainage
 - Reclamation of Strip Mined Areas
 - Ore Beneficiation
 - Mineral Exploration Technology
 - Mining Technology
 - Tunnelling Technology
 - Domestic Source of Alumina

TECHNOLOGY TO REDUCE COSTS OF MEETING
AIR QUALITY STANDARDS

- ☐ ● Stationary sources:
 - ☐ ● Special turbines to operate from refined coal gas.
- ☐ ● Mobile sources:
 - ☐ ● External combustion engines (turbines and steam).
New Alkali batteries.

AN EXAMPLE OF ORE BENEFICIATION

Development of a Domestic Source of Alumina

(U. S. Imports \$500 million per year now)

- Dawsonitic Shales could yield one million barrels of oil per day and as a by-product 40,000 tons of alumina per day -- 50% of U. S. demand in 1985. Demonstration plant would take eight years and cost \$20 million.
- Two pilot plants to demonstrate feasibility of producing alumina from clay would cost \$24 million and take five years.

NEW USES OF COMMUNICATIONS TECHNOLOGY

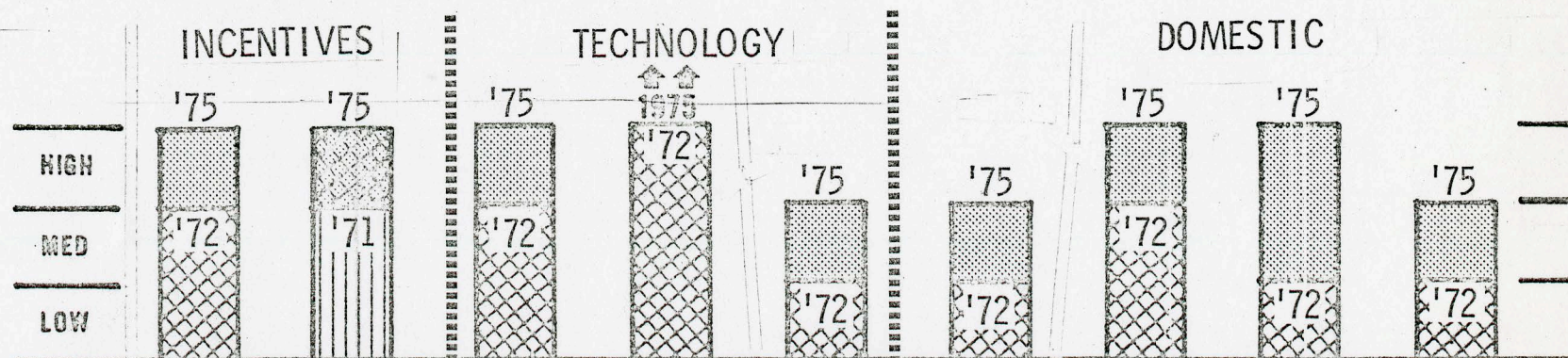
- Electronic Mail Handling
 - Speeds mail processing while reducing costs
- Document Transmission
 - Increased quality and speed
- Disaster Warning
 - Warnings actuate addressed receivers
- Health Care
 - Regional Medical Information and Records
 - Medical Education
 - Remote Diagnosis and Treatment
- Community Communications
 - Wired "Town Meetings" with two-way Communication
- A "National" Satellite Communication Network Directly into Homes
- Educational "Narrowcast" with Student Response

TECHNOLOGY TO REDUCE COSTS OF MEETING AIR QUALITY STANDARDS

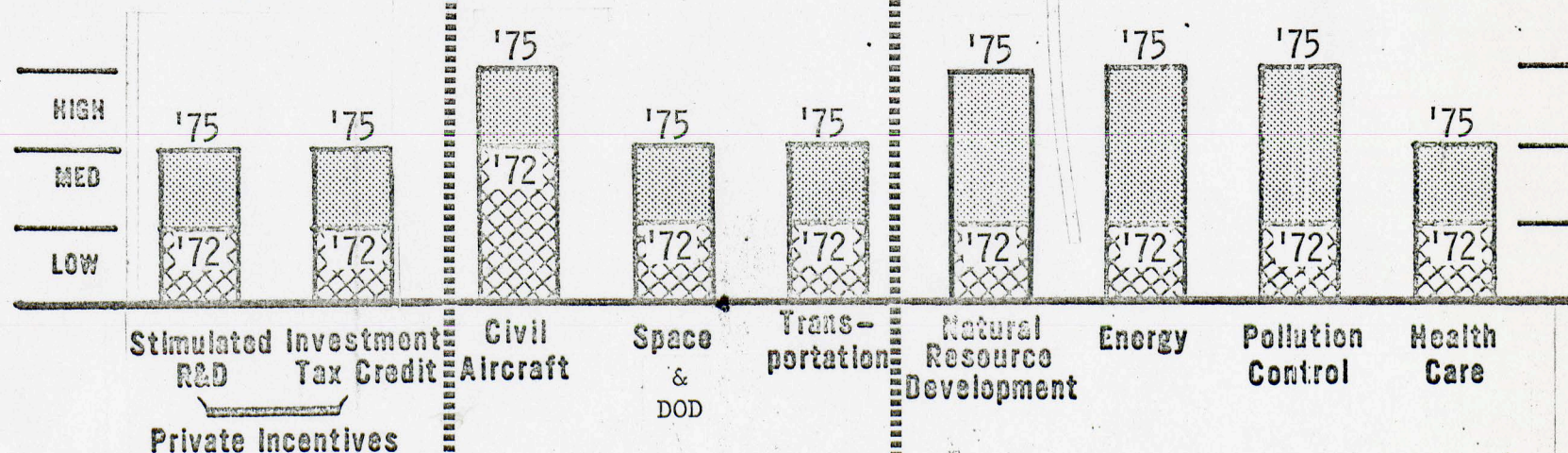
- Stationary Sources
 - Special Gas Turbine - Steam Turbine Combinations to Operate From Refined Coal Gas. Fluidized Bed Combustion to Reduce Pollution.
- Mobile Sources
 - External Combustion Engines (Turbines and Steam). New Alkali Batteries.

IMPACT OF TECHNOLOGY INITIATIVES AND INCENTIVES BY CALENDAR YEAR

EMPLOYMENT AND COST IMPACT



TRADE IMPACT



ELEMENTS OF A PRESIDENTIAL PROGRAM

- INCENTIVES
- INITIATIVES
- MANAGEMENT AND POLICY MECHANISMS
 - Early Return - Jobs
 - Aircraft
 - Space
 - Domestic
 - Transportation
 - Natural Resources
 - Private Sector Incentives
 - R&D
 - Investment Tax Credit
 - Long Term Return - Jobs and Trade, Domestic Affairs and Industrial Productivity
 - Energy
 - Pollution Control
 - Aerospace
 - Transportation
 - Health Care
 - Materials Technology
 - Waste Management

PROPOSAL: A DEFINITIVE PROGRAM TO FOCUS R&D PROGRAMS

By 1 December 1971

UNITED STATES GOVERNMENT

Memorandum

DATE:

In reply
refer to:SUBJECT: New Technology Opportunities Review of
Mandatory and Voluntary Standards Practices

FROM : W. M. Magruder

TO : Attached list of addressees (Attachment A)

REF : Domestic Council Study - "Evaluation of New Technology
Opportunities", dated 1 July 1971, from John Ehrlichman
to agencies

It is requested that J. Loken convene the working group shown in Attachment A, to accomplish the charter shown in Attachment B, in order to seek out sensible new technology opportunities to generate a more vigorous pace of innovation in U.S. industry, to increase industrial productivity, to improve the U.S. competitive international position and to perhaps orient mandatory and voluntary standards policies to early and effective action aimed at urgent national needs and/or economic opportunities. A tentative schedule of activities is shown in Attachment E, which is meant to allow adequate time to consider at least the potential areas of concentration shown in Attachment C and to contact at least the potential sources of innovative ideas shown in Attachment D. An outline of the desired review information is shown in Attachment F.

W. M. Magruder

Attachments

New Technology Opportunities

Mandatory and Voluntary Standards Task Force:

Members

<u>Name</u>	<u>Department</u>	<u>Background</u>
J. Loken	W. H.	Legal
R. Nordahl	W. H.	
Bud Krogh	W. H.	Legal
L. Branscomb	Commerce (NBS)	Standards
	Justice	
	DOD	
	OST	
	OMB	
	State	
	Interior	
	EPA	
	DOT	
	AEC	
	FTC *	
	Industry *	

* Consultant basis when required.

New Technology Opportunities

Mandatory and Voluntary Standards Task Force:

Charter

- Purpose:
- 1) Examine the existing mandatory standards, and potential voluntary standards, in all their aspects as they relate to new technology opportunities designed to generate:
 - a) a more vigorous pace of innovation in civilian industry, to increase productivity and, in turn, to improve the U.S. international competitive position.
 - b) and, to orient the making of new or revised standards toward new technology opportunities in the civilian sectors. The technology opportunities should be directed at basic national needs and/or economic opportunities.
 - 2) to seek means for greater U.S. participation in international standards development as it can enhance new technology opportunities.
 - 3) to seek means for supporting voluntary standard making actions as they will enhance new technology opportunities.
 - 4) to seek means for avoiding frequent standard changes, the substitution of performance standards for material standards and the promotion of uniformity of national, state, and local standards as they can enhance new technology opportunities

New Technology Opportunities

Mandatory and Voluntary Standards Task Force: Potential Areas of Consideration

- 1) Review of existing standards impacting upon new technology, i.e. pollution standards, safety standards, radiation standards, air traffic control standards, etc.
- 2) Review International Standards Policy Act
- 3) Review of Federal, State, and local standards in areas spotlighted by new Technology Opportunities Task Force (L. Goldmuntz).

New Technology Opportunities

Mandatory and Voluntary Standards Task Force: Potential Sources of Ideas

- 1) Industrial Trade Organizations
- 2) Technology Intensive Business Firms
- 3) Government Agencies:

DOD, OST, AEC, OMB, SBA, NSF, Commerce, Transportation, Interior,
Agriculture

- 4) Individuals of national reput in R&D community
- 5) Academia

New Technology Opportunities

Mandatory and Voluntary Standards Task Force:

1. Chairman to Assemble Task Force - 1 Sept. 1971
Agreements on:
 - 1) Membership
 - 2) Charter
 - 3) Potential action or review
 - 4) Potential sources of ideas
 - 5) Schedule of assignments and due dates
 - 6) Organize review of available material
2. Request Potential Sources for Contribution
 - 1) Send out requests - 3 Sept. 1971
 - 2) Replies received - 27 Sept. 1971
3. Receive "Technology Opportunities Inputs"
(L. Goldmuntz) - 8 thru 14 Sept. 1971
4. Receive DOD Congressional Review "Government Practices on Procurement" Committee Report
 - 1) Utilization of Resources (J. Roach & J. Carpenter) - 15 Sept. 1971
 - 2) Regulations (L. Fallick)
 - 3) Research and Development (J. Roach & J. Carpenter) - 1 Sept. 1971
 - 4) Major System Acquisition (P. Soergel) - 15 Sept. 1971
5. Receive Federal Council of Science and Technology
Report "International Transfer of Technology"
from Treasury Department (John Petty) - 27 Sept. 1971
6. Receive Commerce Department Study "Innovation in Government-Industry Arrangement" (J. Lynn) - 27 Sept. 1971

7. Task Force Progress Review

Schedule

- | | | |
|--|---|---------------|
| 1) Review of available material complete | - | 15 Sept. 1971 |
| 2) Review of outside source material | - | 4 Oct. 1971 |
| 3) Complete draft of task force recommendations | - | 15 Oct. 1971 |
| 4) Review of Recommendations: OST/OMB | - | 19 Oct. 1971 |
| 5) Review Ehrlichman, Shultz, Flanigan, Peterson | - | 23 Oct. 1971 |
| 6) President - Final Plan | - | 27 Oct. 1971 |

New Technology Opportunities

Mandatory and Voluntary Standards Task Force: Review Outline

1. Description of Items
2. Source of Items
3. Needed for Items
 - a. Who benefits (what industries, what geographical location, etc.)
 - b. Why (importance)
 - + Urgent national problem and social benefits
 - + Opportunity for economic growth
 - + Export or import replacement (balance of trade)
 - + Employment impact
 - + Technical leadership impact
 - + National security impact
 - + Enhanced foreign policy impact
 - + Improved productivity impact
 - + Resources saving impact
 - c. What are the pay offs (social and economic areas, industry, etc.)?
 - d. When needed?
4. Feasibility
 - a. Analysis
 - + Results
 - + Who did analysis
 - + Risks
 - b. Alternatives (Trade-offs)
 - + Risks (side-effects, problem-areas, international impact, social and business barriers, etc.)

c. Past Experience

- + Tried before? When?
- + By whom and results?
- + Other nations' related experience