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(PART I) ON AN ANALYSIS OF THE ALLOCATION OF
FEDERAL BUDGET RESOURCES AS AN INDICATOR OF
NATIONAL GOALS AND PRIORITIES TO NATIONAL
AERONAUTICS AND SPACE ADMINISTRATION

Leonard L. Lederman, et al

Battelle Memorial Institute
Columbus, Ohio

10 February 1969

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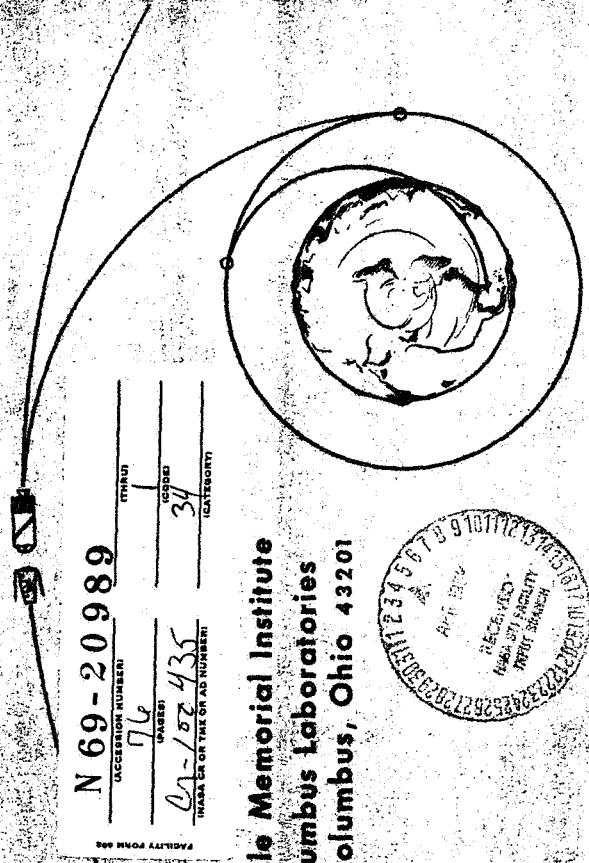
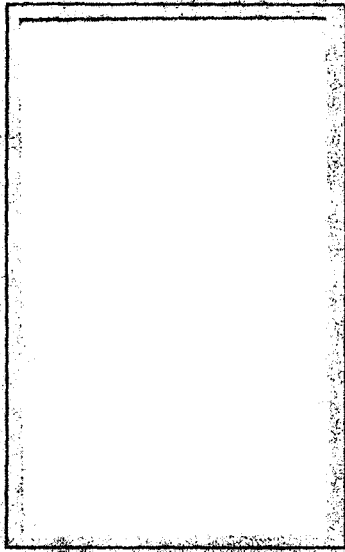
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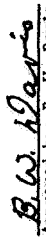
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(PART I)

ON
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AS AN INDICATOR OF NATIONAL GOALS AND PRIORITIES
TO
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
UNDER
CONTRACT NUMBER NASw-1146

BY
LEONARD L. LEDERMAN AND MARGARET L. WINDUS
FEBRUARY 10, 1969


L. L. Lederman - Author


M. L. Windus - Author


Approved by: B. W. Davis

Director
NASA Launch Vehicle Planning Project

BATTELLE MEMORIAL INSTITUTE
Columbus Laboratories
505 King Avenue
Columbus, Ohio 43201

PREFACE

Why should Launch Vehicle and Propulsion Programs concern itself with national goals?

There is competition for the limited supply of federal resources and research and development capability. The future space program and the number and kind of launch vehicles that it will require can be reasonably judged only in the context of all of the competition for federal support.

Furthermore, launch vehicles are required for programs in support of an ever growing number of national purposes other than space. Examples of these programs are weather forecasting, communications, and earth resources surveys. By examining national goals for possible space applications, we expect to achieve more complete planning.

Lastly, NASA, like any other federal agency, is one component in the totality of government operations. Its future plans must be formulated to enhance effectively the overall goals of the government. Studies such as this are designed to contribute to this purpose.

STATEMENT OF ATTRIBUTION AND DISCLAIMER

This report was prepared under a contract with the National Aeronautics & Space Administration. The judgments expressed in this report are those of the authors, and do not necessarily reflect the views of the National Aeronautics & Space Administration or any other department or agency of the United States Government.

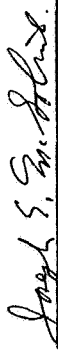

Joseph E. McGolrick, Program Manager
Advanced Programs and Technology
Launch Vehicle and Propulsion Programs
Office of Space Science and Applications
National Aeronautics and Space Administration

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CHAPTER I. INTRODUCTION

AN ANALYSIS OF THE ALLOCATION OF FEDERAL BUDGET
RESOURCES AS AN INDICATOR OF NATIONAL GOALS AND PRIORITIES

CHAPTER I. INTRODUCTION

"The unique function of a public budget is to implement the conclusions of a political philosophy through the assignment of resources to their accomplishment." Melvin Anshen, 1965. (1)*

"One...gets a better understanding of where we are now from a review of where we have recently been." Bernard Brodie, 1964. (2)

Scope and Purpose

The objective of this entire project, of which this study is a part, is the development of "a new and better rationale for long-range planning of space transportation systems, and related subsystems and technologies". (3) One element necessary to satisfy this objective was an "analysis of various categorizations of National goals and objectives and definition of a set useful in space program planning". (3) A second element is "establishing an acceptable set of well defined space goals and objectives so that they can be correlated with National goals and objectives" (3) in a way that could be "useful in planning future space transportation requirements". (3)

This report is restricted to the first of these foregoing elements, which is described as including:

"Survey and evaluation of various direct and implied categorizations and definitions of National goals and objectives (using such sources as Goals for Americans, (4) Goals, Priorities, and Dollars, (5) and current National budgets, Congressional organization, Federal Government organization, and platforms of the political parties) leading to definition of one or more useful sets." (3)

Because the planned use of this report involves relating national goals and objectives to space goals and objectives, special attention has been given to the allocation of Federal research and development (R&D) budget resources. This will permit the later consideration of space goals and objectives in relationship to both broader national goals and objectives and more specific Federal scientific and technological activities.

Conceptual Framework

For the purposes of this study, the word "national" in "national goals and objectives" is used to mean "Federal" or "Federal Government." The word may be defined more

*Superscript numbers denote References given at the end of this Chapter.

broadly, but the interest here is in Federal Government activities as a focal point of national goals and objectives.

The conceptual elements on which this study is based are as follows:

- Activities are goal-oriented
- Priorities exist among goals
- Analysis of past and present activities and goals may contribute to an understanding of the future.

Actions of the Government are expressed primarily through laws passed by the legislature, administrative actions of the executive branch in carrying out those laws, and decisions of the judiciary in interpreting the laws. Although some actions of the Government do not directly relate to the expenditure of money, this study is based primarily on the allocation of Federal budget resources as an indicator of Federal activities with respect to expressed goals. These goals are grouped into areas of interest that we term "functional fields," which themselves contribute to more general goals that we call "super goals." Goals and objectives identified in this paper are based, for the most part, on Presidential messages, budget statements, and laws passed by the Congress. Although Government actions that are not directly related to expenditure of money may influence the availability of money (such as economic policy), the effects of such actions are eventually seen in Government expenditures. Other actions of Government, such as passage of an open housing law, may involve almost no expenditure of money, but still be an expression of a national goal or objective.

Although the authors are keenly aware of and sensitive to the many ways that a Government may act and, thereby, express its goal orientations, the allocation of Federal budget resources appears to be the best reflection of Government action with respect to national goals and priorities. This was well expressed by Melvin Anshen in the quotation at the beginning of this chapter: "The unique function of a public budget is to implement the conclusions of a political philosophy through the assignment of resources to their accomplishment." (1) An approach similar to Anshen's has been employed by sociologists for many years in analyzing family philosophy and goals (6), and although credited by some as too materialistic, it would still seem to be the best approach for families or for nations.

Another reason for using The Budget as a principal indicator of national goals is the obvious fact that it presents a quantified, objective, and explicit measure of the allocation of resources to national goals. Thus, budgetary elements may be expressed in quantified relationship to each other, for example, in dollars and in ratios. These relationships are then an indication of priorities. The availability of this quantifiable indicator of goals was not, however, the primary reason it was chosen. Obviously, if it were not also a valid indicator, the fact that it is quantified would offer no advantage. The logic behind its validity can be expressed rather crudely, but effectively, by the adage "Put your money where your mouth is." Despite the many statements made about national goals, it is usually a willingness to devote fiscal resources to these goals that signifies their real importance.

The final element of the approach used here involves the assumption that analysis of past and present actions and goals should contribute to an understanding of the likely future. This is partially expressed in the Bernard Brodie statement: "One . . . gets a better understanding of where we are now from a review of where we have recently

been." (2) It is believed that this statement may be extended to include also a better understanding of the probable future.

Definitions

To make the key terms used here clear to the reader, it is necessary to define them as they are used in this study. Many of the definitions have been taken from a Committee for Economic Development publication on Budgeting for National Objectives (7).

- National: As explained in the previous section, "national" refers to "Federal" or "Federal Government".
- Goals: "Statements of highly desirable conditions toward which society should be directed." (7)
- Objectives: "The stated purposes of an organization — or an individual — capable of planning and taking action to gain intended ends. They are generally more limited and more specific than broad goals, and are frequently quantitative." (7)
- Programs: "Time-phased plans for allocating resources and for specifying the successive steps required to achieve stated objectives." (7)
- Program Objectives: "The specific results to be attained by the planned commitment of resources." (7)
- Priorities: "A preferential rating; esp.: one that allocates rights to goods and services usually in limited supply." (8)
- Functional Field: An area of activities conceived of primarily with regard to similarity of ultimate use (to be discussed more fully below.)
- Subfunction: A major category within a functional field.

The Technical Notes at the end of Part I (Appendix B) contain additional definitions and technical information necessary for a thorough understanding of this report.

Methodology

Using the conceptual framework outlined above, similar work by others was explored to determine the extent to which previous approaches could be adapted for use in this project. Two well-known publications on national goals were examined: Goals for Americans (4), and Goals, Priorities and Dollars — The Next Decade (5). The first study was done at the request of President Eisenhower and was the stimulator of subsequent public and Governmental focus and discussion of "goals". The concept of goals used in that study was broader than we are using here and encompassed such basic and fundamental goals as democracy, freedom, and equality. Because the focus of this

study was primarily on a different level of goals -- those for which some expression of action and resource allocation could be gathered -- the set of goals used in the Goals for Americans study was not incorporated here. The study is of interest, however, as a reminder of the less tangible goals which ultimately lie behind the more tangible goals that we will be discussing.

Lecht's book on Goals, Priorities and Dollars -- The Next Decade(5) is similar to this report in its quantified treatment of goals. It dealt, however, with the entire economy, whereas this study is concerned with national goals as expressed by the Federal Government. Many of the functional fields used here are the same as those used by Lecht, although defined differently. Lecht includes activities outside of the Federal Government (e.g., consumer expenditures, state and local government activities) which are not discussed in this report, which focuses on a more detailed treatment of Federal activities. Lecht's book serves to emphasize that an examination of national goals must address the question of priorities among goals.

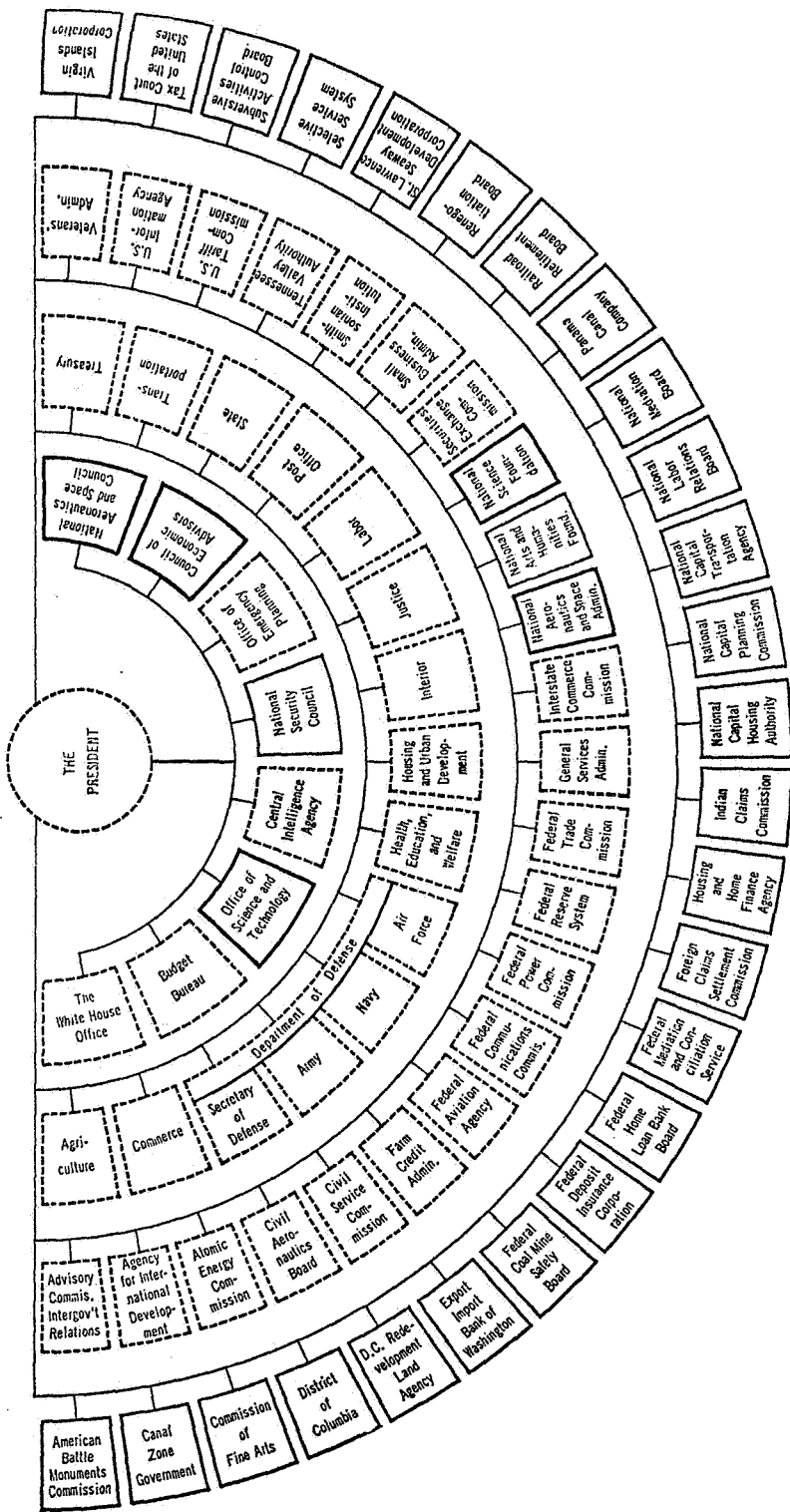
In conformance with the concept discussed earlier, that is, basing goal orientation on budgetary allocations, the FY 1969 Budget(9) was examined. This document organizes Federal outlays by agency and also by function. The arrangement by agency (or other administrative body) is largely a reflection of the historical growth and development of the administrative apparatus of the Executive Branch, as shown in Figure I-1 -- the extent of interest in scientific activities is shown on this figure. Although this arrangement is indicative of lines of responsibility and authority in carrying out Government programs, and is the basis on which Congressional appropriations are made, the functional classification is most useful when discussing goals and objectives of the Federal Government. Thus, where the broad functions served by Government programs are similar (such as International Relations), they are classified together. This approach enables one to compare Government activities more easily in terms of goals and objectives. It has been found useful by the authors mentioned above, and was endorsed by the President's Commission on Budget Concepts. (10)

The functional fields used here (these are similar to those used in The Budget*) are as follows:

- (1) National Security
- (2) Welfare
- (3) Health
- (4) Commerce, Transportation, and Communications
- (5) Education and Knowledge
- (6) Agriculture
- (7) International Relations
- (8) Labor and Manpower
- (9) Veterans
- (10) Space
- (11) Housing and Community Development
- (12) Natural Resources and Environmental
- (13) General Government.

*Reference 9 is referred to as The Budget throughout this report.

FIGURE I-1. ORGANIZATION OF THE EXECUTIVE BRANCH OF THE GOVERNMENT AND INVOLVEMENT IN SCIENTIFIC ACTIVITIES



Source: Organization for Economic Cooperation and Development,
 Reviews of National Science Policy: United States, Paris,
 March 1968, p. 110.

Although some of the titles and, more importantly, some of the line items included under The Budget functions have been changed here, this is basically the scheme used in The Budget, with the following major exceptions:

- Health, Labor, and Welfare (which is one function in The Budget) is split into its three component parts and treated as three separate functional fields.
- Interest on the debt is a functional field in The Budget but is not in this report, because it has no "use" of its own. It is rather a result of past and present decisions made to fund the other functions.

Thus, this report includes 13, rather than 12, functional fields. Each field is described and defined in its own Chapter of this report, and the differences between the definition of the field used here and that presented in The Budget are explained. In addition, Appendix B to Part I shows the line items from The Budget included in each functional field and the R&D program areas which relate to the fields. In assigning individual line items to the thirteen functional fields, the breakout used in The Budget was followed unless there was a compelling reason to modify it. Differences of opinion can easily arise as to placement of specific line items. Although a concerted effort was made to set up functional fields with internal consistency, the reader can examine their makeup in Appendix B and visualize possible changes. Because of difficulties in data consistency no attempt has been made to go beyond The Budget detail of line items in functional field assignments. This means that some programs (e.g., Defense Department and NASA educational efforts) are included in the functional field most appropriate to the broader budget classification of which they are a part. Programs are not static, and over time a program may well evolve from one functional field to another. The nuclear reactor program of AEC, for example, is classified in the Natural Resources and Environmental field, although at its inception it would have gone into another field because of the lack of commercial applicability. Such a movement may well occur in the near future in other program areas (e.g., NASA Space Applications Programs).

Goals and objectives will be discussed largely in terms of the functional fields (for example, one of the stated goals of the Agriculture field is the achievement of parity income for farmers). Despite the decision that goals such as "freedom" and "democracy" could not be used here because of the difficulty (if not impossibility) of defining them in an operational way, an attempt was made to relate functional field goals to more general national goals. This has been done in a descriptive, rather than quantitative way, and is based on four "major end purposes" suggested by Murray Weidenbaum in a 1965 study of Congress and the Federal Budget. (1) His description of these purposes is as follows:

"What are the major end purposes for which the various government programs are carried on?"

"In a world of critical international tensions, the initial purpose that comes to mind is the protection of the nation against external aggressors - to maintain the national security. A variety of programs is suggested, ranging from the equipping and maintaining of our own military establishment and the bolstering of the armed forces of other nations regarded as potential allies, to various types of nonmilitary competition.

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"A second basic national purpose, one also going back to the Constitution, is the promotion of the public welfare. Here, under the public welfare interpretation that has prevailed, we find the Federal Government operating in the fields of health, pensions, unemployment compensation, relief, and many other such activities.

"A third major purpose of government programs has received an increasing amount of attention in recent years - economic development. This area covers the various programs to develop natural resources and transportation, as well as to support education and to attempt to quicken the growth rate of the national economy.

"Finally, we have the routine day-to-day operation of the government, such as the functioning of the Congress and the Federal courts, the collection of revenues."

Although Weidenbaum, in his book, attempts to relate Government expenditures to one of these four purposes, functional fields were found to be generally multiple-purpose and, therefore, their expenditures were not allocated to a specific "supergoal" (as these end purposes are called). However, an attempt was made to indicate the supergoals to which each functional field makes its principal contributions, as shown in Figure I-2. These relationships are described in the separate functional field chapters, and are meant to be indicative rather than final or exclusive. The reader could also visualize lines connecting some of the functional fields which are interrelated, such as Space with Education and Knowledge. A few examples of these interrelationships are shown on Figure I-2

This completes the discussion of the conceptual and methodological framework, which treats governmental activities as goal-oriented, with goals expressed descriptively in messages, laws, etc., and quantitatively in comparative terms by the Federal budget. This budget can be broken into functional fields of activity, each field with its own goals, which ultimately contribute to broader national "supergoals".

Presentation

The results of the study are presented in a comparative fashion in Chapter II, showing trends over time (the FY 1961 to FY 1969 period) and comparisons among functional fields. Chapter II is largely made up of charts, graphs, and tables, with accompanying commentary, to give the reader an overview and summary of the functional field comparisons and trends over time. These two chapters, together with the Appendices, comprise Part I of the report.

Part II consists of individual chapters on each of the 13 functional fields (in descending order of total 1969 funding), which are generally organized into the following sections:

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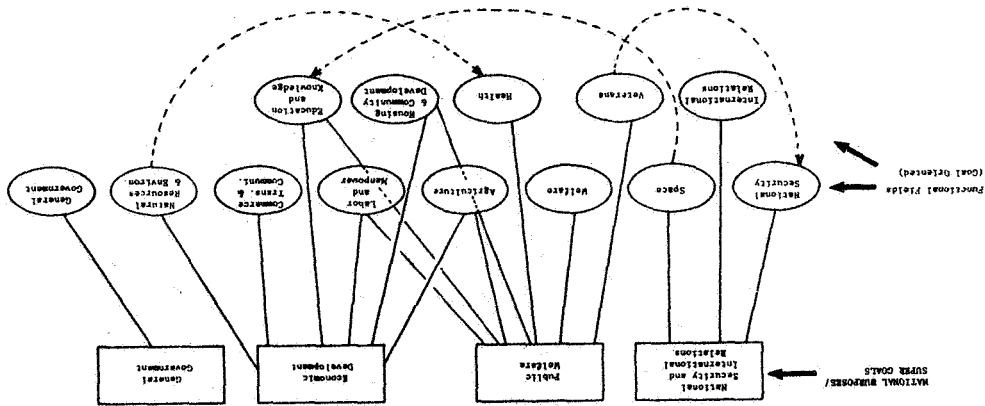


FIGURE I-2. SCHEMATIC RELATIONSHIP OF FUNCTIONAL FIELDS TO NATIONAL GOALS

- A title page that shows the overall dollar funding trends over time for the functional field's total outlays and R&D Conduct* expenditures; and the percent of total Government outlays and R&D conduct that the functional field accounts for over time.
- An introductory section on the functional field as a whole, including definition, summary of Government interest in it, and allocation of Government funds to the field as a whole and to its subfunctions.
- A number of sections describing smaller segments of the field, generally following the "subfunctional" breakout of each field used in the Federal Budget as shown in the previous section.
- A section on research and development, included because of this study's special interest in the contributions of R&D to various Government activities.
- A section excerpting relevant portions of the 1968 Democratic and Republican party platforms as one indication of what future goals may be.
- A section on the "90th Congress" summarizing the actions of the recently concluded Congress related to the functional field and, in particular, expressions of Congressional priority in terms of appropriations.
- A section on "The Likely Future (The Next Decade)", attempting to indicate likely relative priorities in the immediate future.

References

- (1) Anshen, Melvin, The Federal Budget As An Instrument For Analysis, Planning, and Management, The RAND Corporation, Santa Monica, California, April, 1965.
- (2) Brodie, Bernard, The American Scientific Strategists, The RAND Corporation, Santa Monica, California, October, 1964, Number P-2979, p 39.
- (3) Written Technical Directive (WTD) No. 24, Contract NASw 1146, Subject: "Space Goals and Objectives", May 15, 1968. See Appendix A to Part I of this report.
- (4) Goals for Americans, Report of the President's Commission on National Goals, The American Assembly, Columbia University, 1960.

*Excludes R&D physical facilities and major equipment. R&D conduct is used in this report as the best measure of Federally supported scientific and technological activities.

- (5) Lecht, Leonard, Goals, Priorities and Dollars, The Next Decade, National Planning Association, The Free Press, New York, New York, 1966.
- (6) LePlay, Frederic, Les Ouvriers Européens, Paris: Alfred Mame et Fils, 1879.
- (7) Committee for Economic Development, Research and Policy Committee, Budgeting for National Objectives, January, 1966.
- (8) Webster's Seventh New Collegiate Dictionary.
- (9) The Budget of the United States Government, Fiscal Year 1969, United States Government Printing Office, Washington, D. C., 1968. Referred to throughout this report as The Budget.
- (10) President's Commission on Budget Concepts, Report of the President's Commission on Budget Concepts, U. S. Government Printing Office, Washington D. C., October, 1967. The major recommendations of this Commission were incorporated in the FY 1969 Budget, used as the basic source of data for this study. The Commission Chairman, David M. Kennedy, is now Secretary of the Treasury, and the Staff Director, Robert P. Mayo, is now the Director of the Bureau of the Budget.
- (11) Weidenbaum, Murray, and Saloma, Jack, Congress and the Federal Budget, American Enterprise Institute for Public Policy Research, 1965.

CHAPTER II. OVERVIEW AND SUMMARY

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CHAPTER II. OVERVIEW AND SUMMARY

Introduction

One of the prime purposes of this study, as discussed in Chapter I, is to compare priorities among national goals and objectives. Having explained the conceptual framework and methodology in Chapter I, this chapter summarizes the broader comparative findings of the study in terms of priorities. Priority indications in this study are based on funding levels (i. e., the allocation of Government fiscal resources) among the functional fields, which are the mechanism for organizing national goals and objectives.

This chapter shows trends over time and comparisons among the functional fields for the past period of FY 1961 through FY 1968, the present FY 1969, and the likely future. The material is largely in the form of summary figures (charts and graphs) with accompanying commentary that will provide a comparative overview before presenting the more specific and detailed discussions of each functional field which make up the remaining chapters of this report.

The next section shows total funding trends and priorities among the functional fields including:

- The relative priorities among functional fields,
- Changes in funding,
- Trends in relative priorities, and
- Trends in funding.

Because of the special interest of this study in Government scientific and technological efforts, R&D funding trends and priorities are summarized following the discussion of total funding trends, utilizing the same measures and analytical techniques.

Next is a comparison of funding trends and priorities for total outlays and R&D showing the relative importance of R&D to total outlays within the various functional fields and comparisons among them over time.

Interest in appropriation actions of the 90th Congress is high because of the great number of reductions made under a very tightly constrained budget. In a number of instances Congress substantially altered the Administration's requests and showed significant differences in terms of priorities. These Congressional appropriation actions are summarized by field prior to a discussion of the likely future (the next decade) with respect to the 13 functional fields.

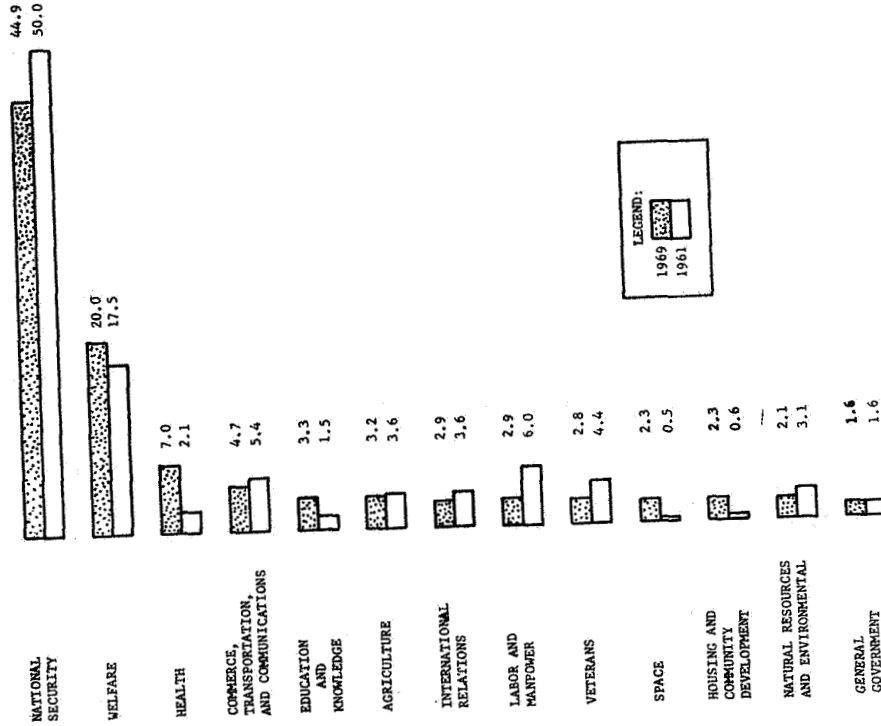
The final section of this chapter is a summary of the general findings in terms of the principal purposes of this study as discussed in Chapter I. The Appendix to this chapter provides the detailed data on which the figures shown in the chapter and the accompanying analysis are based.

In total, the material which follows in this chapter is designed to provide a summary and an overview of where we have been, where we are now, and a better understanding of the likely future in terms of national goals, objectives, and priorities and the relationship of Government R&D efforts.

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FIGURE II-1. FEDERAL GOVERNMENT OUTLAYS BY FUNCTIONAL FIELD
Percent of Total



II-2
Total Funding Trends and Priorities

Relative Priorities Among Functional Fields (1969 and 1961)

Relative priorities among the functional fields are shown on Figure II-1 in terms of percent of total Government outlays. The major findings are summarized below.

- Following are the 13 functional fields in rank order and in terms of relative priority (percent of total 1969 Government outlays):*

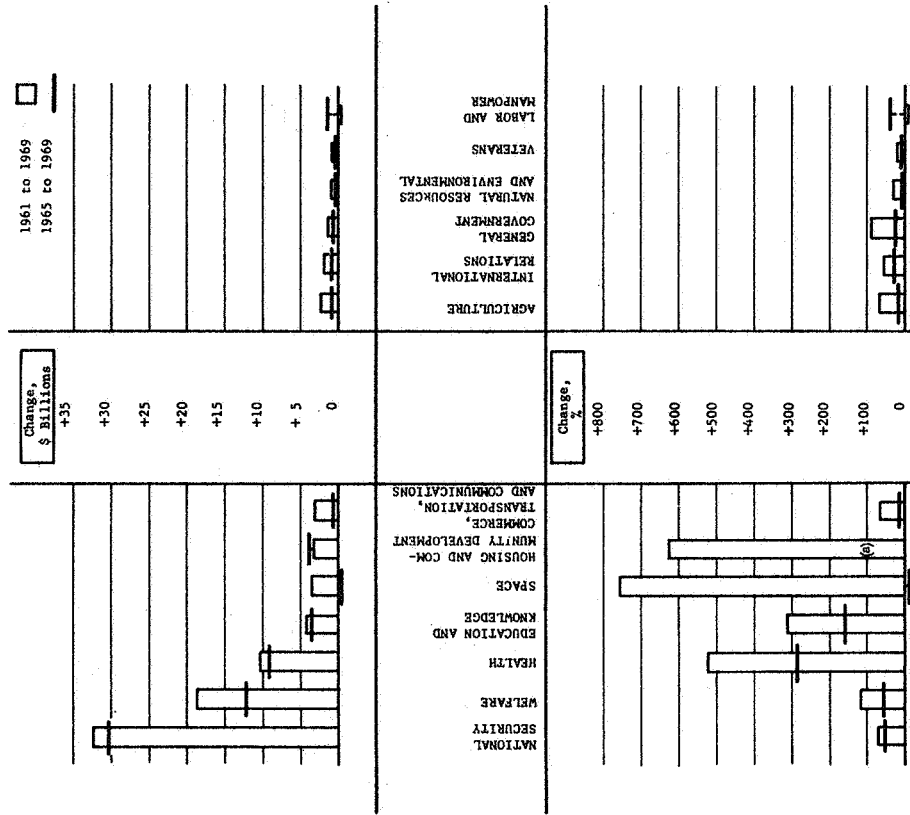
(1) National Security	44.9%
(2) Welfare	20.0
(3) Health	7.0
(4) Commerce, Transportation, and Communications	4.7
(5) Education and Knowledge	3.3
(6) Agriculture	3.2
(7) International Relations	2.9
(8) Labor and Manpower	2.9
(9) Veterans	2.8
(10) Space	2.3
(11) Housing and Community Development	2.3
(12) Natural Resources and Environmental	2.1
(13) General Government	1.6

- A comparison of the two bars for each functional field on Figure II-1 indicates whether the field has become more or less important in terms of relative priority between 1961 and 1969, and by how much, as follows:

More Important - Welfare	+2.5%
Health	+4.9
Education and Knowledge	+1.8
Space	+1.8
Housing and Community Development	+1.7
Less Important - National Security	-5.1
Commerce, Transportation, and Communications	-0.7
Agriculture	-0.4
International Relations	-0.7
Labor and Manpower	-3.1
Veterans	-1.6
Natural Resources and Environmental	-1.0
Same - General Government.	

*Different measures of relative priority were calculated, as explained in Appendix II-A and shown on Table II-5.

FIGURE II-2. CHANGES IN GOVERNMENT FUNCTIONAL FIELD OUTLAYS



(a) Cannot be calculated for 1965-1969 due to minus outlays in 1965.

Changes in Funding (1961-1969 and 1965-1969)

Figure II-2 shows changes in funding of the functional fields in dollars (top of figure) and percentages (bottom of figure). The bars designate changes for the full 1961-1969 period and the lines indicate changes from 1965-1969. The following points summarize the most significant changes:

- There has been a major increase in National Security (over \$30 billion). Two other fields grew by over \$10 billion - Welfare (over \$18 billion) and Health (over \$10 billion). In all three cases most of the dollar increase came in the last half of the 1961 to 1969 period.
- No other field grew by as much as \$5 billion. Most of the growth in Education and Knowledge (over \$4 billion) was in the 1965 to 1969 period. Housing and Community Development, and Labor and Manpower, grew more in the 1965 to 1969 period than the entire period because of decreases in the 1961 to 1965 period. Space was the only field that decreased in the latter period.
- Because of different bases, percent changes in outlays vary widely from dollar changes. Of the three fields with largest 1961-1969 dollar increases (National Security, Welfare, and Health), only Health was also among those fields with largest percent increases:

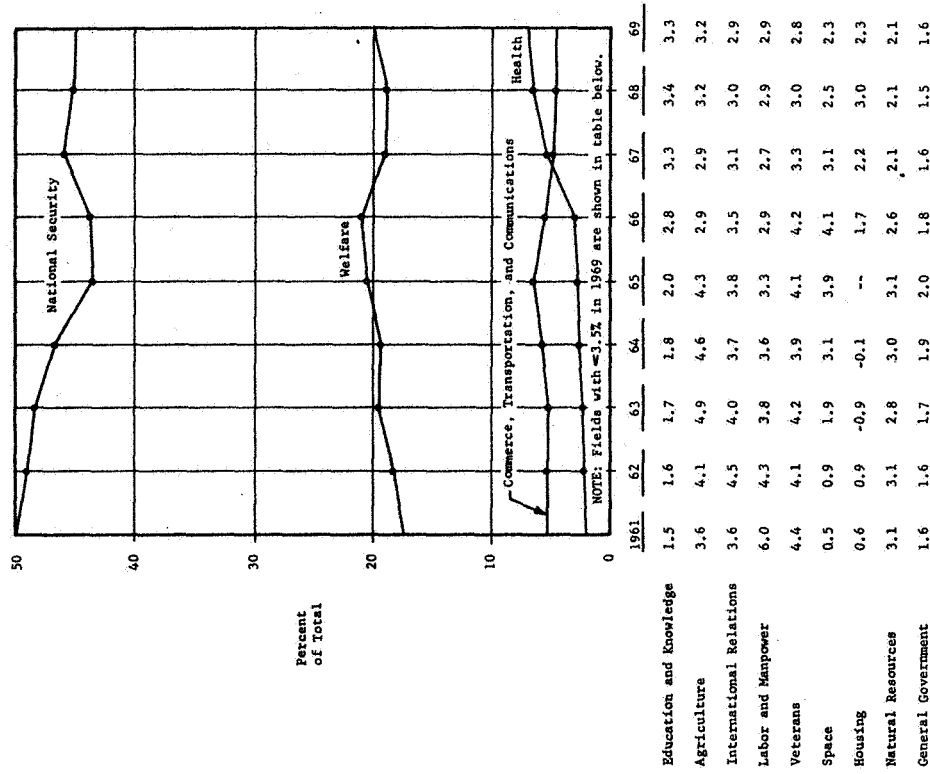
Largest Dollar Increases	Largest Percent Increases
National Security	Space
Welfare	Housing and Community Development
Health	Health

Trends in Relative Priorities (Year by Year, 1961-1969)

Year by year trends in relative priorities (percent of total outlays) from 1961 through 1969 by functional field are shown on Figure II-3. The major findings follow and are similar to Figure II-1, but include all years from 1961-1969:

- National Security and Welfare are predominant, with National Security going down in percent of total over the period and Welfare increasing. This graph shows, in addition, that National Security was an even lower percent of total in the middle of the period and then rose again.
- The large increase in Health as a percent of total Government outlays stands out in this graph as the Health line rises from the conglomeration of lower fields in a steady arc from 1966 to 1969.
- The line for Commerce, Transportation, and Communications is a little above those for the remaining fields. The other fields (1969 less than 3.5%) are so close together (variance of only 1.7% between the lowest and highest in 1969) that their paths cross frequently and are somewhat difficult to distinguish. For this reason, the plots for these fields are not shown but, rather, their actual percent figures are given. Note, that this group of fields is closer together in 1969 outlays than it was in 1961 outlays.

FIGURE II-3. FUNCTIONAL FIELD OUTLAYS AS PERCENT OF TOTAL OUTLAYS

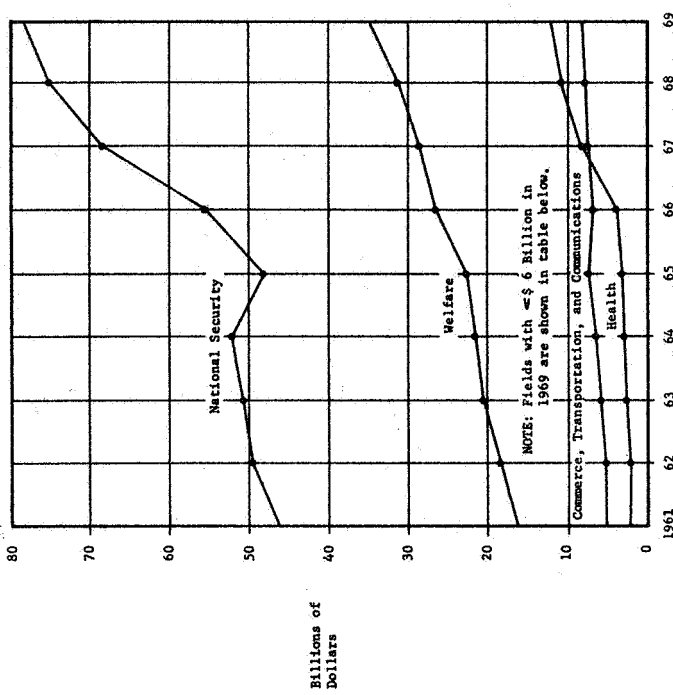


Trends in Funding (Year by Year, 1961-1969)

The final presentation of total outlays by functional field is on Figure II-4, which plots the dollar outlays for each field year by year for 1961 through 1969. The following points summarize the major findings:

- The most striking aspect of this graph is the outlay line for National Security, which shows steady growth in the earlier years (except 1965) and a strong surge after 1966. It is interesting to compare this line with the National Security percent of total line shown on the previous graph, because, despite its strong upward trend in dollar outlays, there was a lowering of the percent of total Government outlays over the 1961 to 1969 period. Despite its strong absolute dollar growth, the National Security field's percent growth of outlays was lower than the average Government growth.
- Welfare occupies the midground on this graph, and shows steady growth over the entire period, with stronger growth since 1965.
- The bottom grouping is very close, as it was in percent of total, with Health rising well above the other fields in the latter part of the period. The field of Commerce, Transportation, and Communications was consistently a little above the others. Because the remaining fields (less than \$6 billion each in 1969) are so close, dollar figures are shown for these fields at the bottom of Figure II-4.

FIGURE II-4. OUTLAYS BY FUNCTIONAL FIELD



Research and Development Funding Trends and Priorities

Because of the special interest in Government scientific and technological efforts described in Chapter I, an examination of Federal R&D funding trends and priorities is discussed next. The analysis follows the format presented in the previous section for total outlays.

Relative R&D Funding Priorities Among Functional Fields (1969 and 1961)

Relative R&D priorities among the functional fields are shown on Figure II-5. The fields are in descending order of total outlays rather than order of R&D conduct expenditures.

- The following are the 13 functional fields, in rank order, and in terms of relative priority in R&D funding (percent of total 1969 Government R&D conduct expenditures):

(1) National Security	53.1%
(2) Space	23.4
(3) Health	7.3
(4) Education and Knowledge	6.8
(5) Natural Resources and Environmental	4.9
(6) Commerce, Transportation, and Communications	1.9
(7) Agriculture	1.4
(8) Welfare	0.4
(9) Housing and Community Development	0.3
(10) Labor and Manpower	0.3
(11) General Government	0.1
(12) International Relations	0.1
(13) Veterans	0

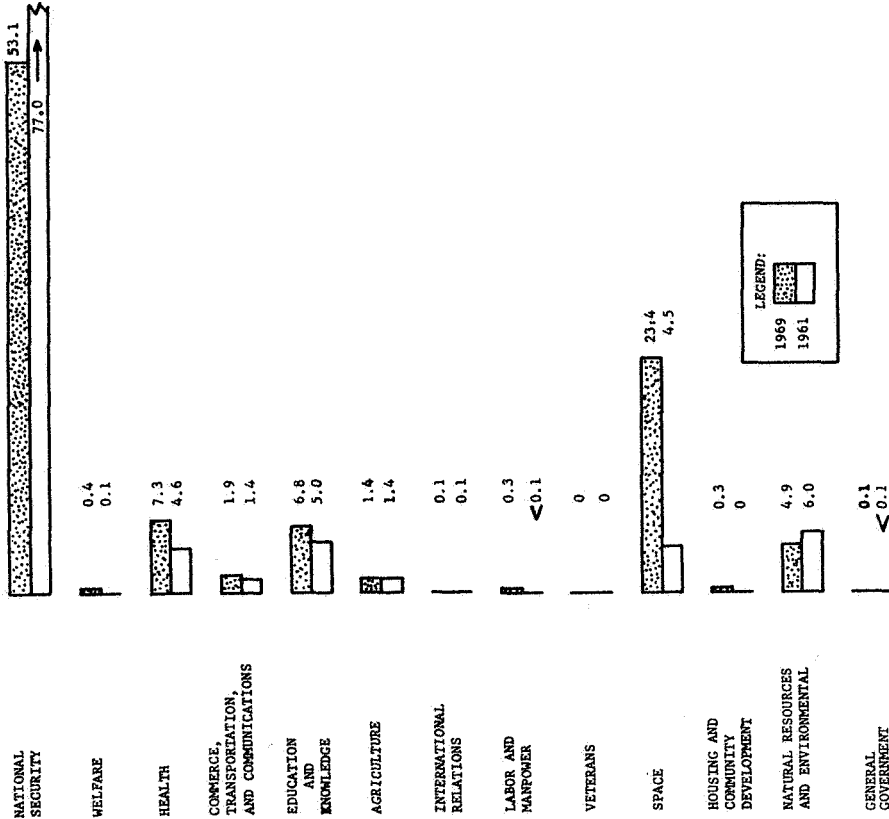
- A comparison of the two bars for each functional field on Figure II-5 indicates whether the field has become more or less important in terms of relative R&D priority between 1961 and 1969 and how much, as follows:

More Important -	Space	+18.9%
	Health	+ 2.7
	Education and Knowledge	+ 1.8
	Commerce, Transportation, and Communications	+ 0.5
	Welfare	+ 0.3
	Housing and Community Development	+ 0.3
	Labor and Manpower	+ 0.3
	General Government	+ 0.1

Less Important -	National Security	-23.9
	Natural Resources and Environmental	- 1.1

Same - Agriculture, International Relations, and Veterans.

FIGURE II-5. FEDERAL GOVERNMENT R&D CONDUCT EXPENDITURES BY FUNCTIONAL FIELD
Percent of Total

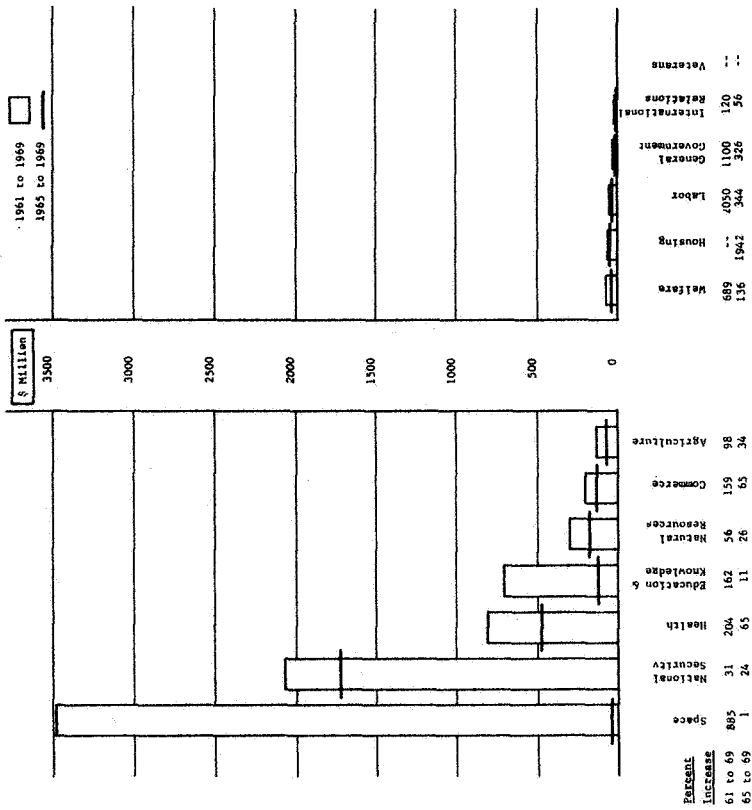


Changes in R&D Funding (1961-1969 and 1965-1969)

Figure II-6 shows changes in R&D funding of the functional fields. The bars designate changes during the full 1961-1969 period and the lines indicate changes during the shorter 1965-1969 period. The figures at the bottom of each column show the percent change corresponding to the dollar change in R&D conduct expenditures for each functional field during each of these periods. The following points summarize the most significant changes:

- 1961 to 1969 Dollar Growth (Columns). In dollar growth of R&D expenditures, Space is the leader (\$3.5 billion), followed by National Security (>\$2 billion). Health and Education and Knowledge are in the middle ground (both under \$1 billion growth) followed by Natural Resources and Environmental; Commerce, Transportation, and Communications; and Agriculture, with \$100 to \$500 million growth. The group on the right side of the figure all showed less than \$100 million in growth.
- 1965 to 1969 Dollar Growth. (Lines intersecting Columns). Space shows almost no growth in this more recent period in R&D expenditures (<\$50 million) compared to the largest growth in the earlier period. In contrast, National Security shows most of its dollar growth in R&D expenditures in the last 4 years. The line intersecting the Education and Knowledge column indicates that most of the growth in R&D expenditures occurred in the earlier part of the 1961 to 1969 period.
- Percent Changes. As noted earlier, some percent growth figures are very large because of small base figures, even though the dollar growth, relative to other fields, may be very small. All fields except National Security and Natural Resources and Environmental experienced significant percentage increases in R&D funding over the 1961-1969 period. However, Space and Education and Knowledge show a marked slowdown in percent increases in funding in the latter half of the period and only National Security and Housing and Urban Development have percent changes in the 1965-1969 period that are better than half the 1961-1969 percent changes, reflecting the general decrease in R&D funding growth rates.

FIGURE II-6. CHANGES IN GOVERNMENT R & D CONDUCT EXPENDITURES BY FUNCTIONAL FIELD

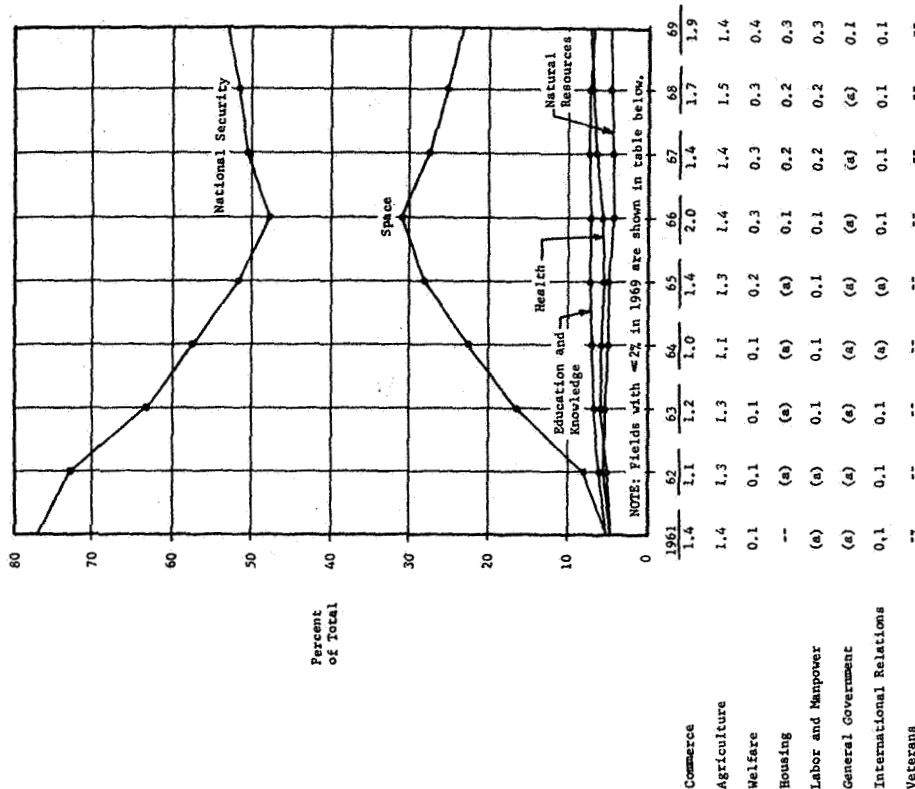


Trends in Relative R&D Funding Priorities
(Year by Year, 1961-1969)

Year by year trends in relative R&D funding priorities (percent of total R&D conduct expenditures) from 1961 through 1969 by functional field are shown on Figure II-7. The major findings follow and are similar to Figure II-5 but include all years from 1961-1969.

- National Security R&D is predominant, but shows a reduction over the 1961 to 1969 period with a corresponding increase in Space, which is clearly in second place. This graph shows quite strikingly the near mirror image of the National Security and Space lines in percent of total, with National Security decreasing and Space increasing between 1961 and 1966, and then a turnabout as National Security began to increase its relative position and the relative position of Space decreases.
- The relative position of the other fields remains fairly constant except for Health, which rises more quickly after 1965 and takes over third position from Education and Knowledge in 1969.
- Functional fields with smaller R&D efforts (less than 2% of total R&D) are not plotted. The actual figures for these fields are shown at the bottom of Figure II-7.

FIGURE II-7. FUNCTIONAL FIELD R & D CONDUCT EXPENDITURES AS PERCENT OF TOTAL GOVERNMENT R & D CONDUCT EXPENDITURES



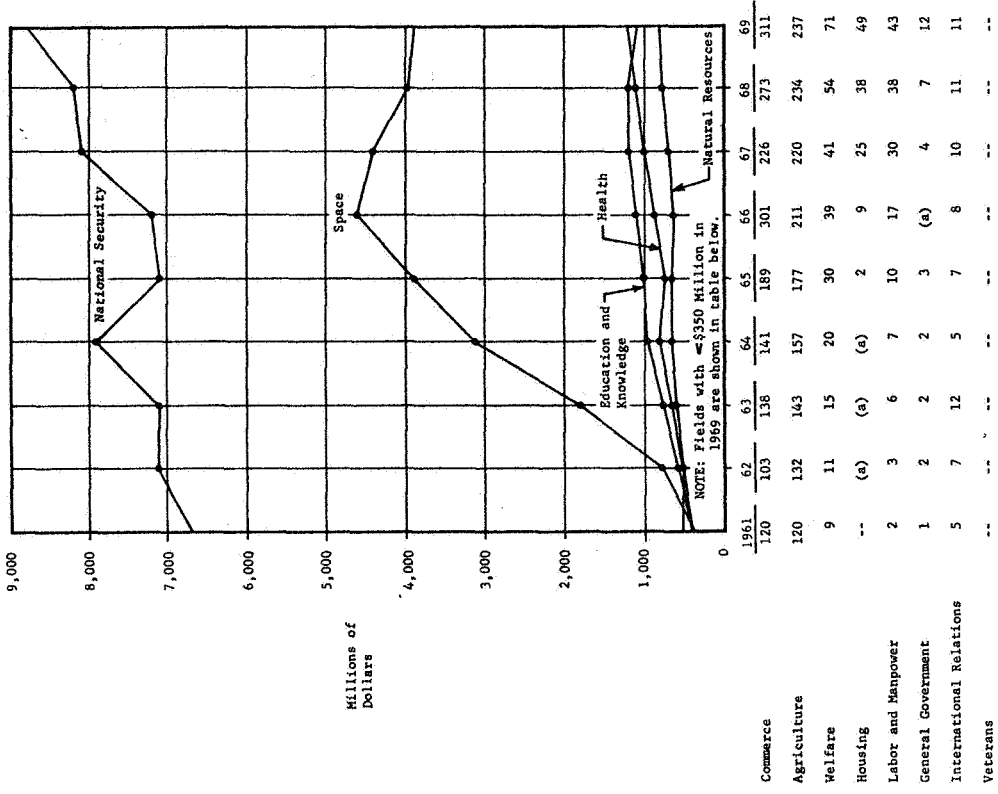
(a) Less than 0.05%.

Trends in R&D Funding (Year by Year, 1961-1969)

The final presentation of R&D conduct expenditures by functional field is shown on Figure II-8, which plots the dollar R&D expenditures for fields spending over \$500 million on R&D in 1969, year by year, for 1961 through 1969. The following points summarize the major findings:

- The mirror image shown by the National Security and Space lines in Figure II-7 (percent of total) does not show up here because National Security R&D expenditures were not (for the most part) dropping in absolute dollars, even when these dollars were dropping as a percent of total Government R&D expenditures. The National Security line shows only one sharp drop, that between 1964 and 1965. Other yearly changes are erratic, varying from almost level to sharply rising.
- Space shows a very steep rise from 1961 to 1966, and a drop from 1966 to 1969. But, its rank in R&D expenditures, second to National Security, is still well established.
- The remaining lines appear in many respects similar to the percent of total lines of Figure II-7, except that their slopes tend to be a little steeper. Education and Knowledge rose until 1967 and shows a drop since then. Health increased considerably each year except 1965. Natural Resources showed little change between 1961 and 1966 and is up moderately since then, but as a percent of total on Figure II-7 is down for the entire period. As on the percent of total figure, the smaller (less than \$350 million in 1969) R&D fields are not plotted here but their actual dollars are shown at the bottom of Figure II-8.

FIGURE II-8. GOVERNMENT R&D CONDUCT EXPENDITURES BY FUNCTIONAL FIELD



(a) Less than \$0.5 million

Total Outlays and Research and Development Expenditures Compared

It should be clear from the preceding two sections that budget resource allocations by functional field for total outlays and R&D expenditures are very different. This is not surprising because, obviously, we should expect the importance of R&D to the various functional fields to differ. Nonetheless, a comparison of total outlays and R&D expenditures is useful and provides some insights into the question of how the nation's scientific and technological resources can contribute more to national goals and objectives.

As pointed out in Chapter I, a more specific analysis of this question with regard to Space goals, objectives, and capabilities will be attempted in later work and this is the primary reason the study summarized in this report was undertaken. The concern here is the more general quantitative relationship that requires an examination of qualitative scientific and technological capabilities for more specific analysis.

A useful way to compare the allocation of budget resources by functional field for total outlays and R&D expenditures is to express R&D expenditures as a percent of total outlays (i.e., the portion of total budget resources spent on R&D). The following figures show this relationship for 1961 and 1969:

Functional Field (In Descending Order of 1969 Total Outlays)	R&D Conduct Expenditures, Percent of Total Outlays	
	1961	1969
National Security	14.6	11.2
Welfare	0.1	0.2
Health	20.3	10.0
Commerce, Transportation, and Communications	2.4	3.8
Education and Knowledge	30.8	19.6
Agriculture	3.6	4.2
International Relations	0.1	0.2
Labor and Manpower	(a)	0.9
Veterans	--	--
Space	85.7	98.3
Housing and Community Development	--	1.2
Natural Resources and Environmental	18.3	22.2
General Government	0.1	0.4
Total Government	9.5	9.5

(a) Less than 0.05%.

The following points summarize the relationships suggested by the above data:

- (1) In total, the Federal Government allocates about 9-1/2 cents out of every dollar to R&D. This allocation is the same in 1969 as in 1961.
- (2) Fields allocating a higher proportion, same proportion, and lower portion of 1969 total outlays to R&D than the Government average are given below.

	More than 9.5%	About 9.5%	Less than 9.5%
Space	98	Health 10	Agriculture 4
Natural Resources and Environmental	22		Commerce, Transportation, and Communications 4
Education and Knowledge	20		Housing and Community Development 1
National Security	11		Labor and Manpower 1
			General Government <1
			Welfare <1
			International Relations <1
			Veterans 0

(3) The following figures show the extent to which the allocation of budget resources to R&D increased or decreased (as a percent of total outlays) between 1961 and 1969 for each functional field that allocates more than 1% in 1969:

	Increased Allocation, %	Decreased Allocation, %
Commerce, Transportation, and Communications	+ 1	National Security - 3
Agriculture	+ 1	Health -10
Space	+13	Education and Knowledge -11
Housing and Community Development	+ 1	
Natural Resources and Environmental	+ 4	

(4) While it is understandable for R&D to be a higher proportion of Space, Natural Resources and Environmental, Education and Knowledge, and National Security fields and a lower proportion of some other fields (e.g., Welfare, Labor and Manpower, Veterans), it is not clear why a higher proportion of resources do not go for R&D in such fields as Commerce, Transportation, and Communications, and Housing and Community Development. Those individuals and organizations interested in increasing the contributions of scientific and technological resources to national goals and objectives should explore the feasibility of applying such resources to all fields but especially to those fields with increasing priority that have significant technical problems and which are devoting relatively small amounts of available resources to R&D.

(5) In general, the 1969 figures for R&D as a percent of total outlays show less dispersion around the mean of 9.5% than do the 1961 figures. To put it another way, those fields with R&D as a percent of outlays greater than the 9.5% government average have tended to increase outlays faster than R&D; thus R&D represents a lower percentage of the increased outlays. This is true for National Security, Health, and Education and Knowledge, although Space, and Natural Resources and Environmental have moved in the other direction. On the other hand, those fields with R&D as a percent of outlays less than the 9.5% mean have increased R&D faster than outlays. For those fields, R&D represents a higher percentage of the

increased outlays (e. g., Welfare, Commerce, Transportation, and Communications, Agriculture, International Relations, Labor and Manpower, Housing and Community Development, and General Government). While such data cannot demonstrate cause and effect, they do show a quantitative relationship of movement in the direction of closer (but not very close) balance between the allocation of total outlays by functional fields (national goals and objectives) and the allocation of R&D expenditures.

The 90th Congress

Interest in the appropriation actions of the recent 90th Congress is high because of the great number of reductions made under a very tightly constrained budget situation. In a number of instances, the Congress substantially altered the Administration's requests and showed significant differences in terms of priorities. Congressional appropriations are concerned with New Budget Authority (NBA) rather than actual expenditures, which is the data base used elsewhere in this Chapter. Congressional NBA actions exclude permanent appropriations, trust funds, and some other financing arrangements not requiring new appropriations from the general treasury.

Congressional changes in Administration 1969 NBA requests undoubtedly will affect expenditures in 1969 and future years but the precise effects of these changes and later Administration adjustments will not be known until after the end of the Fiscal Year (June 30, 1969). Despite this, it is important to review briefly the actions as an indication of Congressional changes in relative priority.

Overall, Congress reduced the Administration's appropriation requests by 10%. Congressional NBA actions have been ordered according to the functional field concept used in this report and the results are shown below. A reduction of less than 10% would be an indication of higher than average Congressional priority; a reduction of more than 10% an indication of lower than average Congressional priority. It should be noted that Congress acts on (or reacts to) the Administration's NBA requests and may be reducing substantial increases requested, still leaving important increases (e. g., Housing and Community Development) or may be reducing somewhat further the already substantially reduced requests (e. g., Space). The individual functional field Chapters that follow discuss 90th Congress actions in greater detail and provide data on selected line items (programs) within each functional field.

	Functional Fields Reduced <10%	Functional Fields Reduced >10%	
Welfare	-1	Agriculture	-14
Veterans	-2	Commerce, Transportation, and Communications	-18
Health	-3	Housing and Community Development	-28
General Government	-4	International Relations	-40
Natural Resources and Environmental	-6		
Education and Knowledge	-6		
National Security	-7		
Space	-9		
Labor and Manpower	-9		

In addition, Congress refused to authorize the sale of over \$2 billion of participation certificates in the Housing and Community Development and Veterans fields.

The Likely Future (The Next Decade)

Looking into the future is always hazardous and judgmental (even though based primarily on data trends, as in this report) and knowledgeable people do have honest differences of opinion. For this reason such judgments have been made explicit here and put in a format that will enable others who disagree to utilize their best judgment. The likely relative growth indicators shown are based upon past trends in funding levels and, in a few instances, judgments about the possibility of breaks in these trends due to already apparent changes in priorities as discussed in later chapters of this report. Some unexpected changes in priorities and initiations of new fields will undoubtedly occur during the next decade, as they have in the past, but the nature of these is not predictable.

Table II-1, which appears at the end of this section, summarizes an estimate of the likely future relative growth for each of the functional fields in terms of total gross expenditures (left side of table) and R&D conduct expenditures (right side of table). 1969 expenditures and percent of total field are shown to indicate the absolute dollars and relative importance of each of the fields.

The relative growth concept is a comparison of the percent change 1969/1967 in expenditures for each field with the total Federal Government percent change 1969/1967. These figures are shown in the third column on each side of Table II-1 and the fourth column shows the results of this comparison on the basis of the following scale:

Relative Growth Comparison Scale			
Change, % 1969/1967	Total Gross Expenditures Growth Relative to Average 1967 to 1969	Total R&D Conduct Expenditures Change, % 1969/1967	Growth Relative to Average 1967 to 1969
>+35	Well above	>+10	Well above
+21 to +35	Above	+7 to +10	Above
+14 to +20	About average	+3 to +6	About average
+9 to +13	Below	0 to +2	Below
<+9	Well below	<0	Well below
Total Federal Government			
Average		Average	
Functional Fields			

The final column on each side of Table II-1 shows an estimate of the likely future in relative growth terms. The immediate past and present probably provides the best indication of probable trends in the near future. Where the information reviewed and studied to prepare this report provides no indication of a break with the immediate past and present (i. e., no reason to expect an increase or decrease in priority), this column has the same term as the preceding column for 1967 to 1969. Where there was some basis for expecting a change in priority, the terms in this column will differ from the

preceding column and the notes under the "Comments" on the right will reflect the rationale. Also noted under "Comments" are a few other considerations of special importance to this report. The chapters that follow, on the individual functional fields, discuss the likely future of each in greater detail and analyze the subfunctions in each field.

The following points summarize the major findings of Table II-1:

A major finding of this study is that funding trends for functional fields do not change sharply over short periods of time (i.e., breaks with past trends occur rarely). The only major exception to this, in the recent past, is the rapid and unexpected growth of the Space functional field, and this, in large part, was a result of Soviet space achievements rather than an internally generated break with past priorities.

As a result, there are only two places on Table II-1 where the likely future differs from the recent past and then only slightly. These are:

- The increase in the relative growth rate for total gross expenditures in the General Government functional field (from below average to about average), principally as a result of increased national priority on law enforcement.
- An increase in total gross expenditures for Education is likely, from about average to above average, owing to increased priority, especially post-Vietnam. An increase in the well below average growth rate for the R&D part of the Education and Knowledge field to a below average relative growth rate is likely. R&D in this field is principally fundamental research related to new knowledge, and the change is postulated on a likely reaction to what is generally considered to be overly severe funding constraints.

The following functional fields have experienced well above or above average relative growth rates in the immediate past and these are likely to continue:

- Relative Growth in Total Gross Expenditures
Well Above Average Above Average
 Health Welfare
 Agriculture Labor and Manpower
 Housing and Community Development
- Relative Growth in R&D Conduct Expenditures
Well Above Average Above Average
 Welfare National Security
 Health Agriculture
 Commerce, Transportation, and Communications
 Labor and Manpower
 Housing and Community Development
 Natural Resources and Environmental
 General Government

The following functional fields have experienced well below average or below average relative growth rates in the immediate past and these are likely to continue:

Functional Field	1966 Percent Change, %		1969 Percent Change, %	1987 to 1969	Likely to 1969	Comments
	1967	1969				
National Security	78,636	44.8	+13	Below	Above	An end to the Vietnam war and no existing "hot" war assumed, but no significant decrease in other international tensions.
Welfare	36,171	20.6	+26	Above	Well	Total gross expenditures could grow at average or even above average rates depending on what happens to ground transportation, which is 59% of total.
Health	12,227	7.0	+50	Well	Well	
Commerce, Transportation, and Communications	8,618	4.9	+13	Below	Above	
Education and Knowledge	5,494	3.1	+20	About Average	Well	
Agriculture	4,618	2.6	+41	Well	Above	Increased priority for education likely to increase total expenditures (especially post-Vietnam). Increase in R&D growth rate to below average because of some lessening in fundamental research funding constraints.

TABLE II-1. ALL FUNCTIONAL FIELDS - IMMEDIATE PAST AND LIKELY FUTURE RELATIVE GROWTH

Relative Growth in Total Gross Expenditures

<u>Well Below Average</u>	<u>Below Average</u>
International Relations	National Security
Veterans	Commerce, Transportation,
Space	and Communication
	Natural Resources and
	Environmental

Relative Growth in R&D Conduct Expenditures

<u>Well Below Average</u>
Space

The International Relations functional field has experienced above average relative R&D growth rates in the immediate past and this is likely to continue.

Summary

The preceding sections in this chapter summarize the findings of this study on relative priorities among national goals and objectives, as organized into the functional fields. The chapters in Part II provide information, data, and findings for each of the specific functional fields. It is useful, at this point, to discuss a few of the more general findings of this study in terms of the scope and purpose outlined in Chapter I.

Various official and semi-official committees and organizations are and have been concerned with the problem of defining useful sets of National Goals and with determining the relative priorities which have been, are now, and are likely to be assigned to these. Some of the sets of goals have included such intangible items as "Freedom" which have immeasurable value and for which it is impractical to determine costs. However, there appears to be general agreement that goals are activity oriented and that these can be grouped in useful sets. If these groups have been appropriately formulated, past and present Federal budgets can be analyzed to determine the relative priorities assigned by the American public through their representatives in the legislative and executive branches of the government.

In examining various sets and defining a useful set of categories and definitions of national goals and objectives, it was found that the most useful set was one based on functional fields. Such a functional analysis provides a clear approach to examining Federal goals, objectives, and priorities. This study demonstrates that both the approach and the volume of details are manageable for the stated purpose. This does not mean that other approaches utilizing different concepts and methodologies might not also be useful, but categorization by functional field served admirably for the purposes of this study.

The use of the allocation of Federal Budget resources as an indicator of priorities among national goals, while not the only approach that could be followed, is both useful and practical in rationally analyzing Government efforts for these purposes. One of the clearest major findings of this study is that, as expressed in terms of funding trends, relative priorities among national goals and objectives (organized into functional fields) have not changed sharply over short periods of time. The data presented in this chapter

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Growth Relative to Average	1969		Total R&D Conduct Expenditures	1967	Growth Relative to Average	1967	Percent Change, % to 1969	Likely	Future	Comments
	1969	Percent Change, % to 1967								
Functional Field	4.612	2.6	Well	11	0.1	4	4	11	0.1	4
International Relations	5.083	2.9	Above	43	0.3	+46	Well	43	0.3	Well
Labor and Manpower	5.472	3.1	Well	--	--	--	Well	--	--	--
Veterans	3.969	2.3	Well	3.888	23.4	-11	Well	3.888	23.4	-11
Space	2.776	1.6	Well	49	0.3	+100	Well	49	0.3	+100
Housing and Community Development	5.074	2.9	Below	822	4.9	+20	Well	822	4.9	+20
Natural Resources and Environmental	3.089	1.7	Below	12	0.1	+219	Well	12	0.1	+219
General Government	175.837(a)	100.0	Average	16.618	100.0	+17	Well	16.618	100.0	+17
Total	175.837(a)	100.0	Average	16.618	100.0	+17	Well	16.618	100.0	+17

(a) This gross expenditure total is different from the outlay total shown on Table II-2 in that net lending has not been included, and interfund and intragovernmental transactions and applicable receipts from the public (both negative items) have not been included. The totals are actually very close but include slightly different components. The order of the fields is the same as on Table II-2 (i.e., descending order of total outlays).

TABLE II-1. (Continued)

BATTELLE MEMORIAL INSTITUTE - COLUMBUS LABORATORIES

show that breaks with past trends occur only rarely with introduction of such new activities as space and war or with increased emphasis on such problems as those associated with health. There is little reason to suggest that the likely future (near term) will depart substantially from these trends.

Some of the data given here compare Government allocation of resources to R&D with total outlay allocations among the functional fields. These findings are significant to those interested in increasing the contribution of R&D to solving national problems. Among these are:

- The clear indication that the distributed allocation of Government resources to R&D efforts departs significantly from total allocation of Government resources to satisfy national goals and objectives. The existence of a number of functional fields with significant technical problems but relatively low R&D efforts is a clear indication that Government R&D efforts can and should contribute more to national goals and objectives. Examples include those related to Commerce, Transportation, and Communications (e. g., mass urban transit), and Housing and Community Development (e. g., lower cost structures).
- Indications that, over the time period analyzed, there has been a trend toward reallocating R&D resources so that there is better correspondence with the allocation of total resources.
- Indications that R&D funds in a number of fields, while growing, may not be sufficient to exploit new technology that can contribute to the solution of important problems (e. g., satellites for application of space technology to educational television, weather forecasting, navigation and traffic control, and world food supply).

This study presents some of the data and analysis that, when matched with continuing assessments of scientific and technological capability, will provide some basis for improved planning for better use of these scientific and technological resources to satisfy national goals and objectives. Obviously, this study is just a small part of the effort required for such purposes and much more remains to be done.

APPENDIX II-A

DETAILED DATA

The different techniques used are:

- (a) Simple 1969 dollar outlays as percent of total - Column 13 (II) and Column 14 (I).
- (b) 1969 percent of total adjusted by difference between the average annual percent change from 1961 to 1969 for each field and the average annual percent change for all - Column 15 (II) and Column 16 (I).
- (c) 1969 percent of total adjusted by difference between the average annual percent change from 1965 to 1969 for each field and the average annual percent change for all (latest 4 year period only) - Column 17 (II) and Column 18 (I).
- (d) 1969 percent of total adjusted by average of (b) and (c) (in effect adjusting by full 1961 to 1969 period and then 1965 to 1969 again) - Column 19 (II) and Column 20 (I).

The weightings (II) and rankings (I) are self-explanatory. The following points describe differences resulting from techniques (a) through (d):

- (1) Except for Space, Health, and Education and Knowledge, the various techniques produce similar results - in fact, the results are close enough to recommend technique (a) and not to justify the greater sophistication of techniques (b), (c), and (d). For this reason, technique (a) is used wherever relative priorities are discussed in this report.
- (2) Techniques (a) and (d) produce identical ranks and little difference in weightings except for Health, and Education and Knowledge, as noted above.

APPENDIX II-A

DETAILED DATA

The four tables presented in this appendix contain the detailed data on which the figures (charts and graphs) in the foregoing are based.

- Table II-2 gives total outlays by functional field for each year in dollars and as a percent of total. The column on the right shows the change in percent of total over the 1961 to 1969 period. The subtotals used for obtaining percentages exclude interest, special allowances, and undistributed adjustments, which were then added to match the overall yearly Government totals.
- Table II-3 is a similar table for R&D conduct expenditures and shows yearly dollars and percent of total figures for each functional field.
- Table II-4 shows comparisons among the functional fields based on the data in Tables II-2 and II-3. Among the comparisons made by functional field are the following items:
 - Total Outlay Dollars are listed for 1961 and 1969 and rank numbers assigned for both years (Columns 1 and 2).
 - R&D Conduct Expenditures are listed for 1961 and 1969 and rank numbers assigned for both years (Columns 3 and 4).
 - Total Outlays and R&D Conduct Expenditures are listed as a percent of their respective totals for 1961 and 1969 (Columns 5, 6, 7, and 8).
 - Change in percent of total over the 1961 to 1969 period for total outlays and for R&D (Columns 9 and 10).
 - R&D as a percent of total outlays in 1961 and 1969 (Columns 11 and 12).
 - 1961 to 1969 changes, in dollars and in percent, for total outlays and for R&D (Columns 13, 14, 15, and 16).
 - 1965 to 1969 changes, in dollars and in percent, for total outlays and for R&D (Columns 17, 18, 19, and 20).
- Table II-5 shows weighting factors and ranking of functional fields. This table is designed to produce Weighting Factors and Rankings of Functional Fields.

(I) The rankings provide factors based upon a simple 1 to 13 ordinal scale.

(II) The weightings provide more sensitive factors on a 1 to 100 ratio scale.

TABLE II-2. BUDGET OUTLAYS

Function	Outlays in Millions of Dollars									
	1961	1962	1963	1964	1965	1966	1967	1968(a)	1969	1968(a)
Total All Functions	97515	107012	111330	118667	117666	134572	158414	175635		
Interest	8108	8321	9215	9810	10358	11285	12548	13535		
Special Allowances(c)	--	--	--	--	--	--	--	100		
Undistributed										
Adjustments	-2506	-2547	-2666	-2931	-3154	-3421	-4022	-4591		
Subtotal All Functions	92311	101238	104770	111786	110770	128707	149887	166591		
National Security	46134	49777	50894	52273	48276	55577	69970	76930		
Welfare	16133	18580	20489	21691	22726	26686	28842	31466		
Health	1968	2211	2489	2699	3153	3907	5166	10910		
Commerce, Transportation, and Communications	4980	5331	5592	6345	7253	6923	7401	7898		
Education and Knowledge	1410	1876	1912	2094	2243	3520	5001	5606		
Agriculture	3339	4139	5129	5187	4809	3675	4377	5311		
International Relations	3369	4561	4182	4145	4168	4434	4640	5037		
Labor and Manpower	5495	4396	4001	4017	3640	3711	3984	4917		
Veterans	4100	4154	4396	4350	4508	5278	4909	4931		
Space	461	867	2093	3490	4371	5193	4660	4127		
Housing and Community Development	542	895	593	-111	-35	2154	3332	5075		
Natural Resources and Environmental	2877	3106	2938	3395	3411	3328	3151	3505		
General Government	1503	1645	1788	2071	2247	2321	2454	2578		

(a) Estimate.

(b) Less than 0.05%.

(c) Special Allowances. Lump-sum allowances were included to cover possible additional supplemental proposals which might be required for 1968 and 1969. The need for such supplementals might arise from requirements not foreseen for existing programs, or from the enactment of legislation not specifically provided for in the budgets of the agencies concerned.

BY FUNCTION 1961 TO 1969

1968(a)	Percent of Subtotal										1961 to 1969 Change in Percent of Total
	1961	1962	1963	1964	1965	1966	1967	1968(a)	1968(a)	1968(a)	
186002	100	100	100	100	100	100	100	100	100	100	0
14400	50.0	49.2	48.5	46.8	43.6	43.9	46.0	45.2	44.9	44.9	- 5.1
19211	17.5	18.4	19.6	19.4	20.5	21.1	19.2	18.9	20.0	20.0	+ 2.5
19211	2.1	2.2	2.4	2.6	2.8	3.1	5.4	6.5	7.0	7.0	+ 4.9
8214	5.4	5.3	5.3	5.7	6.5	5.5	4.9	4.7	4.7	4.7	- 0.7
5801	1.5	1.6	1.7	1.8	2.0	2.8	3.3	3.4	3.3	3.3	+ 1.8
3609	3.6	4.1	4.9	4.6	4.3	2.9	2.9	3.2	3.2	3.2	- 0.4
5143	3.6	4.5	4.0	3.7	3.8	3.5	3.1	3.0	2.9	2.9	- 0.7
5053	6.0	4.3	3.8	3.6	3.3	2.9	2.7	2.9	2.9	2.9	- 3.1
4884	4.4	4.1	4.2	3.9	4.1	4.2	3.3	3.0	2.8	2.8	- 1.6
3955	0.5	0.9	1.9	3.1	3.9	4.1	3.1	2.5	2.3	2.3	+ 1.8
3939	0.6	0.9	-0.9	-0.1	(b)	1.7	2.2	3.0	2.3	2.3	+ 1.7
3701	3.1	3.1	2.8	3.0	3.1	2.6	2.1	2.1	2.1	2.1	- 1.0
2790	1.6	1.6	1.7	1.9	2.0	1.8	1.6	1.5	1.6	1.6	0

TABLE II-3. R&D CONDUCT EXPENDITURES

Function	Expenditures in Millions of Dollars				
	1961	1962	1963	1964	1967
Total All Functions	8,758.8	9,804.9	11,278.9	13,792.1	15,929.5
National Security	6,747.7	7,138.3	7,118.2	7,871.5	8,059.3
Welfare	8.7	11.4	15.4	19.8	39.3
Health	399.8	513.8	643.1	808.9	869.3
Commerce, Transportation, and Communications	119.5	105.3	138.1	140.7	226.2
Education and Knowledge	433.9	597.9	755.4	963.8	1,196.8
Agriculture	120.1	132.2	143.0	156.6	220.1
International Relations	4.6	6.7	12.0	5.3	7.8
Labor and Manpower	2.3	3.2	6.3	7.2	29.6
Veterans	--	--	--	--	--
Space	395.0	774.6	1,833.2	3,091.6	4,383.8
Housing and Community Development	--	0.3	0.2	0.3	8.9
Natural Resources and Environmental	526.2	521.6	609.5	654.8	629.3
General Government	1.0	1.6	1.5	1.6	0.4

(a) Estimate.
(b) Less than 0.05%.

BY FUNCTION, 1961 TO 1969

1968(a)	Percent of Total									
	1969(a)	1961	1962	1963	1964	1965	1966	1967	1968(a)	1969(a)
15,821.2	16,617.6	100	100	100	100	100	100	100	100	100
8,153.2	8,818.6	77.0	72.8	63.1	57.4	51.5	47.8	50.6	51.5	53.1
54.0	70.8	0.1	0.1	0.1	0.1	(b)	0.3	0.3	0.3	0.4
1,107.5	1,216.6	4.6	5.2	5.7	5.9	5.3	5.8	6.6	7.0	7.3
272.9	311.2	1.4	1.1	1.2	1.0	1.4	2.0	1.4	1.7	1.9
1,155.4	1,138.3	5.0	6.1	6.7	7.0	7.4	7.3	7.5	7.3	6.8
233.6	237.0	1.4	1.3	1.3	1.1	1.3	1.4	1.4	1.5	1.4
10.9	10.6	0.1	0.1	0.1	(b)	(b)	0.1	0.1	0.1	0.1
38.4	43.1	(b)	(b)	0.1	0.1	0.1	0.1	0.2	0.2	0.3
--	--	--	--	--	--	--	--	--	--	--
3,885.5	3,888.9	4.5	7.9	16.3	22.5	28.0	30.9	27.5	25.2	23.4
38.0	49.0	--	(b)	(b)	(b)	(b)	0.1	0.2	0.2	0.3
765.2	822.1	6.0	5.3	5.4	4.8	4.7	4.2	4.3	4.8	4.9
6.6	11.5	(b)	(b)	(b)	(b)	(b)	(b)	(b)	(b)	0.1

TABLE II-4. COMPARISON BY FUNCTIONAL FIELD - TOTAL OUTLAYS

Functional Fields	1969 (est.)		1961		Percent of Total 1969	
	Rank	Millions	Rank	Millions	Outlays	R&D
Total All Functions	97,915	186,062			100.0	100.0
- Interest and Adjustments	5,602	11,301				
Subtotal All Functions	92,311	174,757	9,759	16,618	100.0	100.0
(in FY 1969 order)						
National Security	1 46,134	1 78,525	1 6,748	1 8,819	50.0	71.0
Welfare	2 16,133	2 34,892	8 9	71	17.5	20.0
Health	9 1,988	3 12,211	4 400	3 1,217	2.1	4.6
Commerce, Transportation, and Communications	4 4,980	4 8,214	6/7 120	6 311	5.4	1.4
Education and Knowledge	11 1,410	5 5,801	3 434	4 1,188	1.5	5.0
Agriculture	7 3,339	6 5,609	6/7 120	7 237	3.6	1.4
International Relations	6 3,369	7 5,143	9 5	12 11	3.6	0.1
Labor and Manpower	3 5,495	8 5,053	10 2	10 43	6.0	2.9
Veterans	5 4,100	9 4,824	12/13 --	13 --	4.4	2.8
Space	13 461	10 3,955	5 395	2 3,869	0.5	2.3
Housing and Community Development	12 542	11 3,339	12/13 --	9 49	0.6	2.3
National Resources and Environmental	8 2,877	12 3,701	2 526	5 822	3.1	6.0
General Government	10 1,509	13 2,790	11 1	11 12	1.6	1.6

(a) Less than 0.05%.

AND R&D CONDUCT EXPENDITURES, FY 1961 VERSUS FY 1969

Functional Fields	1961		1969 (e)		Percent of Total 1969		Total Outlays - 1961 to 1969		R&D Conduct 1961 to 1969		Total Outlays - 1965 to 1969		R&D Conduct 1965 to 1969	
	Change in 1961 to 1969	R&D	1961	1969 (e)	1961	1969 Change	1961	1969 Change	1961	1969 Change	1965	1969 Change	1965	1969 Change
	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	0.0	0.0	9.5	9.5	+82,446	+89.3	+7,859	+89.7	+63,987	+57.8	+2,826.1	+20.5		
	-5.1	-23.9	14.6	11.2	+32,391	+70.2	+2,071	+30.7	+30,249	+62.7	+1,714.5	+24.1		
	+2.5	+0.3	0.1	0.2	+18,799	+116.5	+62	+688.9	+12,206	+53.7	+40.9	+136.0		
	+4.9	+2.7	20.3	10.0	+10,243	+520.5	+817	+204.3	+9,068	+287.3	+481.1	+65.4		
	-0.7	+0.5	2.4	3.8	+3,234	+64.9	+191	+159.2	+961	+13.2	+122.0	+64.5		
	+1.8	+1.8	30.8	19.6	+4,391	+311.4	+704	+162.2	+3,558	+158.6	+116.3	+11.3		
	-0.4	0.0	3.6	4.2	+2,270	+68.0	+117	+97.5	+800	+16.6	+60.2	+34.0		
	-0.7	0.0	0.1	0.2	+1,774	+52.7	+6	+120.0	+975	+23.4	+3.8	+55.9		
	-3.1	+0.3	(a)	0.9	-442	-8.0	+41	+2,050.0	+1,413	+38.8	+39.4	+344.3		
	-1.6	--	--	--	+784	+19.1	0	0.0	+376	+8.3	--	--		
	+1.8	+18.9	85.7	98.3	+3,494	+757.9	+3,494	+894.6	-416	-9.5	+30.0	+0.8		
	+1.7	+0.3	--	1.2	+3,397	+626.8	+49	--	+3,974	--	+46.6	+1941.7		
	-1.0	-1.1	18.3	22.2	+824	+28.6	+286	+56.3	+290	+8.5	+169.6	+26.0		
	0.0	+0.1	0.1	0.4	+1,287	+85.6	+11	+1,100.0	+543	+24.2	+8.8	+325.9		

TABLE II-5. WEIGHTING FACTORS AND RANKING OF FUNCTIONAL FIELDS BASED ON 1969 PERCENT

Functions	Year-to-Year Percent Change in Total Outlays										Average Yearly Percent Change 1961 to 1966
	1962/1961	1963/1962	1964/1963	1965/1964	1966/1965	1967/1966	1968/1967	1969/1968	1969/1966	1969/1965	
Subtotal All Functions	9.7	3.5	6.7	-0.9	14.4	18.3	11.1	4.9	8.5	12.2	
National Security	7.9	2.1	2.8	-7.6	15.1	24.1	9.2	4.2	7.2	13.2	
Welfare	15.2	10.3	5.8	4.8	17.4	8.1	9.1	11.0	10.2	11.4	
Health	12.3	13.0	16.0	8.8	23.9	109.0	39.6	11.9	28.6	44.6	
Commerce, Transportation, and Communications	7.0	4.9	13.5	14.3	-4.5	6.9	6.7	4.0	6.6	3.3	
Education and Knowledge	11.8	15.0	12.3	10.3	56.9	42.1	12.1	3.5	20.5	28.7	
Agriculture	24.0	23.9	1.1	-7.3	-23.6	19.1	21.3	5.6	8.0	5.6	
International Relations	35.4	-8.3	-0.9	0.6	6.4	4.6	8.6	2.1	6.1	5.4	
Labor and Manpower	-20.0	-9.0	0.4	-8.4	2.0	7.4	20.9	4.9	-0.4	8.8	
Veterans	1.3	5.8	-1.0	3.6	17.1	-7.0	0.4	-1.0	2.4	2.4	
Space	88.1	134.5	71.7	25.2	18.8	-10.3	-11.4	-4.2	39.1	-1.8	
Housing and Community Development	65.1	(a)	(a)	(a)	(a)	54.7	52.3	-22.4	(a)	(a)	
Natural Resources and Environmental	8.0	-5.4	15.6	0.5	-2.4	-5.3	11.2	5.6	3.5	2.3	
General Government	9.4	8.7	15.8	8.5	3.3	5.7	5.1	8.2	8.1	5.6	

(a) Not calculable because of minus total outlays in some years. (See Table II-2). Figures used are 1969 Percent of Total (Column 18) unadjusted.
 (b) Totals in these columns do not add to 100.0% because of the special procedure for Housing and Community Development and also because of rounding.

Note:

- Column 1 thru 8: Year to year percent change in outlay data (Table II-2: 1961 thru 1969)
- Column 9 = Addition of Columns 1 thru 8 divided by 8
- Column 10 = Addition of Columns 5 thru 8 divided by 4
- Column 11 = Column 9 subtracting Government average (8.5)
- Column 12 = Column 10 subtracting Government average (12.2)
- Column 13 = From Table II-2
- Column 14 = From Table II-4
- Column 15 = Column 13 x Column 11 + 100%
- Column 16 = Column 15 ranking
- Column 17 = Column 13 x Column 12 + 100%
- Column 18 = Column 17 ranking
- Column 19 = Column 15 + Column 17 ÷ 2
- Column 20 = Column 19 ranking.

OF TOTALS AND CHANGES IN TOTAL OUTLAYS BETWEEN 1961 AND 1969

Functions	1969 Percent of Total			1969 Percent of Total			1969 Percent of Total		
	1969	1965	1961	1969	1965	1961	1969	1965	1961
Subtotal All Functions	100.0	101.3(b)	101.25(b)	100.0	101.3(b)	101.25(b)	100.0	101.3(b)	101.25(b)
National Security	-1.3	1.0	44.9	44.9	45.3	44.8	44.9	45.3	44.8
Welfare	1.7	-0.8	20.0	20.0	19.8	20.05	20.0	19.8	20.05
Health	20.1	32.4	7.0	7.0	8.3	8.85	7.0	8.3	8.85
Commerce, Transportation, and Communications	-1.9	-8.9	4.7	4.7	4.3	4.45	4.7	4.3	4.45
Education and Knowledge	12.0	16.5	3.3	3.3	3.8	3.75	3.3	3.8	3.75
Agriculture	0.5	-6.6	3.2	3.2	3.0	3.05	3.2	3.0	3.05
International Relations	-2.4	-6.8	2.9	2.9	2.7	2.75	2.9	2.7	2.75
Labor and Manpower	-8.9	-3.4	2.9	2.9	2.6	2.7	2.9	2.6	2.7
Veterans	-6.1	-9.8	2.8	2.8	2.5	2.55	2.8	2.5	2.55
Space	30.6	-14.0	2.3	2.3	2.0	2.5	2.3	2.0	2.5
Housing and Community Development	(a)	(a)	2.3	2.3	2.3(a)	2.3(a)	2.3	2.3(a)	2.3(a)
Natural Resources and Environmental	-5.0	-9.9	2.1	2.1	1.9	1.95	2.1	1.9	1.95
General Government	-0.4	-6.6	1.6	1.6	1.5	1.55	1.6	1.5	1.55

APPENDIX A

PART I. APPENDICES

WRITTEN TECHNICAL DIRECTIVE NO. 24

APPENDIX A

WRITTEN TECHNICAL DIRECTIVE NO. 24

Contract NASw-1146
Written Technical Directive No. 24
May 15, 1968

SUBJECT: Space Goals and Objectives

BACKGROUND: NASA/OSSA mission plans are the most significant inputs in determining requirements for the future space transportation system, and, thus, for related technology programs. NASA/OSSA programs are interrelated with NASA OMSF, OART, and OIDA, USAF, USN, USA, AEC, ESSA, COMSAT Corp., and other space related programs. All of these programs are directed toward satisfying National goals and objectives.

Despite significant past contributions to National defense, improving communications, educational levels and trends, meteorology, navigation, geodesy, knowledge of the earth's atmosphere, and data on the Solar system, the space program has sometimes been characterized as existing for its own purposes rather than as a contributor to more basic National goals and objectives. This may have contributed to recent fluctuations in the projected space program. These fluctuations have, in turn, made it difficult to plan a space transportation system for the future.

There have been various papers, reports, and books which have attempted to classify and define National goals and objectives in terms of functions, administrative operations, and other categories. There have also been attempts to weight these categories in terms of long term costs and benefits relating to the Gross National Product. Attempts have been and are currently being made to model the relationship of the space program to National problems and programs. In addition, analyses are continuing on National and International problems to determine whether space activities might contribute to the solution of these problems.

The time lag between initiation of development of new propulsion and related space transportation system technologies and actual application in operational systems may be 10 to 15, or even more, years. In order to plan the future overall space programs and the related space transportation system programs on a rational basis, it is clear that these analyses and projections must also be considered. Thus, it is necessary to survey past and current activities of a related nature and determine what factors and methodologies should be considered in the OSSA LVPP planning process.

OBJECTIVE: The basic objective of this work will be to develop a new and better rationale for long range planning of space transportation systems, and related subsystems and technologies. However, it is understood that this must involve subsidiary objectives related to establishing bases for dialogues with various agencies and groups participating in analyzing and evaluating National and International goals and objectives and related programs. This, in turn, must involve:

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- (1) Analysis of various categorizations of National goals and objectives and definition of a set useful in space program planning.
- (2) Establishing an acceptable set of well defined space program goals and objectives so that they can be correlated with National goals and objectives.
- (3) Making recommendations concerning development of new or adapting existing methodologies and techniques for evaluating space programs in view of National goals and objectives which will be useful in planning future space transportation requirements.

SCOPE: Work under this WTD should be initiated with the definition of finite tasks related to the accomplishment of the foregoing objectives. It is now envisioned that these tasks should include:

- (1) Survey and evaluation of various direct and implied categorizations and definitions of National goals and objectives (using such sources as "Goals for Americans", "Goals Priorities and Dollars", past and current National budgets, Congressional organization, Federal government organization, and platforms of the political parties) leading to definition of one or more useful sets.
- (2) Survey and evaluation of direct and implied categorizations and definitions of space program goals and objectives (using such sources as the National Space Act of 1958, OSSA Prospectus, pronouncements by recognized public and private individuals concerned with the space program, NASA and other government organizations, and various studies directed toward definition of specific problems related to these goals and objectives) which are compatible with further efforts to correlate them with National Goals and Objectives.
- (3) Participate in dialogues with other individual groups and agencies involved in similar activities.
- (4) Make recommendations for further activities and perform related studies as required.

APPENDIX B

FUNCTIONAL FIELD DESCRIPTIONS AND TECHNICAL NOTES

APPENDIX B

FUNCTIONAL FIELD DESCRIPTIONS AND TECHNICAL NOTESNational Security Functional Field

This field includes programs "designed to preserve the freedom and territorial integrity of this nation and its allies."⁴

<u>General Program Area</u>	<u>Agency</u>	<u>R&D Program Area</u>	<u>Agency</u>
Department of Defense - Military	DOD	Missiles and Related Equipment	DOD
Military personnel		Aircraft and Related Equipment	"
Operation and maintenance		Military Astronautics and Related Equipment	"
Procurement		Other Equipment	"
R&D, test and evaluation		Military Sciences	"
Military construction		Ordnance, Combat Vehicles and Related Equipment	"
Family housing		Programwide Management and Support	"
Civil defense		Ships, Small Craft and Related Equipment	"
Revolving and management funds and other		Civil Defense	"
Military trust funds		Emergency Fund	"
Military assistance	DOD	Other (includes military pay)	"
Grants and credit sales		Special Nuclear Materials	AEC
Trust fund		Other Military R&D	"
Atomic energy - Military	AEC	Arms Control and Disarmament Agency	ACDA
Defense-related activities		Office of Emergency Planning	OEP
Stockpiling of strategic and critical materials	GSA (a)		
Expansion of defense production	SSS		
Selective Service System	Exec. Off. and HE-W		
Emergency preparedness activities			
Arms Control and Disarmament Agency	ACDA		

(4) Funds appropriated to the President to be used by designated agencies (e.g., Office of Emergency Planning, General Services Administration, Agriculture, Interior, Treasury).

⁴The Budget in Brief, Fiscal Year 1969, Executive Office of the President, U. S. Government Printing Office, Washington, D. C. Referred to throughout this report as The Budget in Brief, FY 1969.

Welfare Functional Field

This field includes programs that provide income for the individual in certain common situations in which he cannot provide for himself through working, as well as a few other programs to improve the individual's welfare. This category also includes communities, as in the case of disaster relief.

<u>General Program Area</u>	<u>Agency</u>	<u>R & D Program Area</u>	<u>Agency</u>
Retirement and social insurance (trust funds)		Social and Rehabilitation Service	HEW
Old age, survivors and disability insurance	HEW		
Civil Service retirement and disability	CSC		
Railroad Retirement (Board)			
Public Assistance and other welfare			
Bureau of Indian Affairs	Interior		
Public assistance (excluding medical assistance)	HEW		
Vocational rehabilitation	HEW		
School lunch, special milk, food stamp, and other	HEW		
Proposed food stamp legislation	HEW		
Proposed juvenile delinquency legislation	HEW		

Health Functional Field

This field includes programs to improve the prevention, and methods of diagnosis and treatment; of adverse health conditions.

<u>General Program Area</u>	<u>Agency</u>	<u>R & D Program Area</u>	<u>Agency</u>
Hospital and medical care	VA	Medical Research	VA
Medical care and hospital services	VA	Prosthetic Research	VA
Construction of hospital and nursing home facilities		Biology and Medicine	AEC
Medical administration, research, and other		Public Health Service	HEW
Health services and research	HEW	National Institutes of Health	
Medical research		Bureau of Disease Prevention and Environmental Control	
Facilities and medical manpower		Other Public Health	
Organization and delivery of health services		Food and Drug Administration	HEW
Medicare (trust funds)			
Medicaid and other financing			
Direct health care			
Prevention and control of health problems and other			

Commerce, Transportation, and Communications Functional Field

This field includes programs designed to "improve transportation and communication services, assist business, develop depressed areas, and assure effective competition and fair business practices. . ." (The Budget in Brief, FY 1969).

General Program Area	Agency	R&D Program Area	Agency
Advancement of business	Commerce	Federal Highway Administration	DOT
Export promotion	Small Bus. Adm.	Federal Aviation Administration	"
Small business assistance	Commerce	Coast Guard	"
Physical standards	Commerce	Railroad Administration	"
Promotion of technology	Commerce	Other R&D	
Economic and demographic statistics	Commerce	Federal Communications Commission	FCC
Federal Deposit Insurance Corporation (trust funds)	FDIC	Federal Trade Commission	FTC
Other aids to business	DOT, HUD, Commerce	Small Business Administration	SBA
Area and regional development		Aircraft Technology	NASA
Department of Commerce: Economic development assistance	Commerce	National Bureau of Standards	Commerce
Appalachia and other	(a)	Maritime Administration	"
Air transportation		Other R&D	
Federal Aviation Administration	DOT	Post Office Department	PO
Civil Aeronautics Board subsidies	CAB		
Aircraft technology	NASA		
Water transportation	Commerce		
Maritime Administration	DOT		
Coast Guard	(b)		
Other			
Ground transportation	DOT		
Highways			
Urban Mass Transit			
Other			
Postal service	Post Office		
Regulation of business	(c)		

(a) Appalachian Regional Commission.

(b) DOT, Atlantic-Pacific Interoceanic Study Commission.

(c) Commerce, Justice, Treasury, Civil Aeronautics Board, Federal Communications Commission, Federal Maritime Commission, Federal Trade Commission, Interstate Commerce Commission, Securities and Exchange Commission.

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Education and Knowledge Functional Field

This field includes programs designed to improve instruction at academic institutions or to enable individuals to take advantage of such instruction. Another major part of this category is programs designed to generate fundamental knowledge.

General Program Area	Agency	R&D Program Area	Agency
Elementary and secondary education	HEW	Physical Research	AEC
Children from low income families		Basic Research Grants	NSF
Other education of the disadvantaged		Institutional Science Programs	"
Special school projects		National Research Centers	"
School books, equipment, counseling, and strengthening State education agencies		National Research Programs	"
Assistance to schools in federally impacted areas		Program Development and Management	"
Other (teacher training)		Science Information Activities	"
Higher education	HEW, and some HUD	Planning and Policy Studies	"
Aid for undergraduate and graduate students		National Sea Grant Program	"
Academic facility grants		Smithsonian Institution	
Other aids to higher education		Scientific Investigations in Space	NASA
Science education and basic research		Office of Education	HEW
Basic research and specialized research facilities	NSF		
Grants for institutional science programs	NSF		
Science education	NSF		
Other science activities	NSF		
Space sciences	NASA		
Other aids to education			
Training of education manpower	HEW		
Vocational education	HEW		
Educational research and development	HEW		
Grants for libraries and community services	HEW		
Indian education services	Interior		
Library of Congress and Smithsonian			
Nad. Fdn. on the Arts and Humanities			
Education and training	Veterans Adm.		

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Agriculture Functional Field

This field includes programs designed to support and assist the farm and rural sector of our Nation's economy.

General Program Area	Agency	R&D Program Area	Agency
Farm income stabilization	Ag	Agricultural Research Services	Agriculture
Price support and related programs		Cooperative State Research Service	"
Conservation reserve, cropland conversion, and cropland adjustment programs		Economic Research Service	"
Removal of surplus agricultural commodities		Other Agriculture R&D	"
National Wool Act		Fertilizer Research and Development	TVA
Sugar Act		Special Agricultural Investigations	TVA
Other		National Commission on Food Marketing	
Financing rural electrification and rural telephones	Ag		
Agricultural land and water resources	Ag		
Soil Conservation Service - conservation operations			
Agricultural conservation program payments (including CCC loans)			
Other			
Financing farming and rural housing			
Farm Credit Administration	FCA		
Farmers Home Administration and other	Ag and HUD		
Research and other agricultural services	Ag		
Present programs			
Proposed legislation for inspection fees			

International Relations Functional Field

This field includes programs designed "to promote a peaceful world community in which all peoples can progress toward more satisfying lives." (The Budget in Brief, FY 1969).

"This functional category includes all federal activities concerned with the conduct of foreign affairs - international economic and financial programs as well as foreign information and education activities." (Colm, Gerhard and Peter Wagner, Federal Budget Projections, The Brookings Institution, March 1966.)

General Program Area and/or Agency(a)	R&D Program Area and/or Agency(a)
Conduct of foreign affairs	Agency for International Development
Department of State	
Tariff Commission	
Foreign Claims Settlement Commission	Other Department of State
Department of Justice (trust funds)	Peace Corps
Treasury Department (trust funds)	United States Information Agency
Economic and financial programs	
Agency for International Development:	
Development loans	
Technical cooperation	
Alliance for Progress	
Supporting assistance	
Contingencies and other	
International financial institutions:	
Export-Import Bank	
Peace Corps	
Other	
Food for Freedom (Agriculture)	
Foreign information and exchange activities	
United States Information Agency	
Department of State and other	

(a) Each program area listed indicates the department or agency.

Labor and Manpower Functional Field

This field includes programs designed to contribute to full employment and a job opportunity for everyone willing to work.

<u>General Program Area</u>	<u>Agency</u>	<u>R&D Program Area</u>	<u>Agency</u>
Manpower programs and other	(a)	Office of Manpower, Policy, Evaluation, and Research	Labor
Unemployment insurance	Labor	Bureau of Labor Statistics	"
		Bureau of Employment Security	"
		Wage and Hour and Public Contracts Division	"
		Other Labor R&D	"
		Office of Economic Opportunity (one-half)	OEO

(a) Labor, Office of Economic Opportunity, HEW, National Labor Relations Board, Equal Employment Opportunity Commission, Interior, Federal Mediation and Conciliation Service, National Mediation Board.

Veterans Functional Field

This field includes programs designed to provide "special benefits and services to veterans of the Nation's wars or their survivors." (The Budget in Brief, FY 1969.) This category includes the more general activities to help veterans. Specific health, education, and housing activities are included under those functional categories.

<u>General Program Area</u>	<u>Agency</u>	<u>R&D Program Area</u>	<u>Agency</u>
Service-connected compensation	VA	None	See Veterans Administration under Health Functional Field
Non-service-connected pensions	VA		
Readjustment benefits (other than education and housing)	VA		
Other veterans benefits and services			
Life insurance benefits	VA		
Veterans Adm. general operating expenses	VA		
Other	(a)		

(a) VA, DOD, and American Battle Monuments Commission.

Space Functional Field

This field includes programs designed "to improve our ability to operate in the space environment, advance man's knowledge of the universe, and use the experience gained for man's benefit." (The Budget in Brief, FY 1969.)

<u>General Program Area</u>	<u>Agency</u>	<u>R&D Program Area</u>	<u>Agency</u>
Manned space flight	NASA	Manned Space Flight	NASA
Manned lunar landing	"	Space Technology	"
Extended manned flight	"	Space Applications	"
Space applications	"	Supporting Activities	"
Space technology	"		
Supporting activities	"		

Housing and Community Development Functional Field

This field includes programs designed to move toward "A decent home and a suitable living environment for every American family." (The Budget in Brief, FY 1969.) Programs are aimed at improving the viability of urban communities by stimulating the economy, helping combat slums, and assisting special groups through grants, loans, and insurance to state and local governments, and to individuals and corporations.

<u>General Program Area</u>	<u>Agency</u>	<u>R&D Program Area</u>	<u>Agency</u>
Public housing programs	HUD	Urban Research and Technology Program	HUD
Aids to private housing		Low Income Housing Administration	HUD
Supplements to the private market	HUD		
Rent supplement program			
Other			
Support of the private market	HUD	Other HUD (Urban Renewal, Urban Planning, Open Spaces)	HUD
FHA and other			
Federal Savings and Loan Insurance Corp.	FSLIC	Office of Economic Opportunity (one-half)	OEO
VA Housing Programs	VA		
Urban renewal and community facilities			
Model cities	HUD		
Aids to improved land use	HUD		
Urban renewal			
Open space land grants			
Urban planning assistance and other			
Proposed metropolitan development legislation			
Assistance for public facilities	HUD		
Basic water and sewer facility grants			
Neighborhood facility grants and other			
Research and other	HUD		
Community Action Programs and other	OEO		
National Capital region	(a)		

(a) District of Columbia, Intergovernmental Commissions, National Capital Planning Commission, National Capital Transportation Agency, Commission of Fine Arts.

Natural Resources and Environmental Functional Field

This field includes programs designed for the conservation, development, and improvement of mineral and other land resources, water quality and supply, forests, fish and wildlife, and recreational areas.

General Program Area	Agency	R&D Program Area	Agency
Land and water resources		Reactor development	AEC
Corps of Engineers	DOD	Other AEC R&D (one-half)	"
Department of the Interior	Interior	Environmental Science Services Administration	Commerce
Bureau of Reclamation		Fish and Wildlife Service	Interior
Power marketing agencies		Federal Water Pollution Control Administration	"
Federal Water Pollution Control Administration		Geological Survey	"
Office of Saline Water		Bureau of Mines	"
Research		Office of Saline Water	"
Bureau of Land Management	TVA	Office of Water Resources Research	"
Tennessee Valley Authority		Office of Coal Research	"
Soil Conservation Service-	Ag	Other Interior R&D	"
watershed projects		Regional Water Quality Management	TVA
International Boundary and Water Commission		Air Pollution Studies	"
Federal Power Commission and other		Other TVA R&D	"
Forest resources	Ag	Civil Functions (mainly Army Corps of Engineers)	DOD
Forest Service	Interior	Forest Service	Agriculture
Bureau of Land Management			
Recreational resources			
Bureau of Outdoor Recreation	Interior		
National Park Service and other	Interior		
Fish and wildlife resources	Mostly Interior		
Mineral resources	Interior		
Bureau of Land Management	Interior		
Bureau of Mines and other	Interior		
General resource surveys and administration	Interior		
Nuclear Energy (AEC - about one-half)	AEC		
Environmental (ESSA)	Commerce		

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General Government Operations Functional Field

This field includes programs providing for "Government-wide service activities, for executive direction and financial management, for programs of law enforcement and criminal justice, and for the costs of the Congress and the Federal Court system." (The Budget in Brief, FY 1969.)

General Program Area	Agency	R&D Program Area	Agency
Legislative functions	(a)	Law Enforcement Administration	Justice
Judicial functions	Judiciary		
Executive direction and management	(b)	Bureau of Engraving and Printing	Treasury
Central fiscal operations:			
Treasury Department	Treasury		
Internal Revenue Service			
Other			
Other agencies	(c)		
General Property and records management			
General Services Administration	GSA		
Public Buildings Service	PBS		
Construction, sites, and planning			
Operation, maintenance and other			
Other			
Central Intelligence Agency Building	CIA		
Central personnel management			
Civil Service Commission	CSC		
Department of Labor and other	Labor		
Law enforcement and justice Department of Justice	Justice		
Other	(d)		
Other general government Territories and possessions	DOD, Interior		
Treasury-claims	Treasury		
Other	(e)		

- (a) Legislative Branch.
- (b) Executive Office of the President; Funds appropriated to the President, Treasury Department, General Services Administration, Federal Radiation Council, Temporary Study Commissions.
- (c) Legislative Branch; Renegotiation Board; Tax Court of the U.S.; Board of Governors, Federal Reserve System; Temporary Study Commissions.
- (d) Treasury Department, Administrative Conference of the U. S., Civil Service Commission, Commission on Civil Rights, Subversive Activities Control Board, Temporary Study Commissions.
- (e) Legislative Branch, Intergovernmental Commissions, Historical and Memorial Commissions.

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Technical Notes*

(NOTE: See Chapter I for additional definitions.)

Sources. Most of the data contained in this report were obtained from The Budget of the United States. The budget covers all Federal agencies and programs no matter how funded. It covers both Federal funds and trust funds. All data obtained from The Budget are actual Fiscal Years 1961-1967, and estimates for Fiscal Years 1968 and 1969. Fiscal Year 1968 (ended June 30, 1968) was still subject to Administrative changes when the FY 1969 Budget was printed; Fiscal Year 1969 data are requests of the President for the present fiscal year (July 1, 1968 to June 30, 1969), which have been changed by Congress as indicated in various sections of this report, and are still subject to Administrative changes. All designations of years with respect to data are Fiscal Years.

Outlays. Outlays are made by the liquidation of obligations by the issuance of checks, by the maturing of interest coupons in the case of some bonds, and, in a few special cases, by the issuance of bonds or notes in lieu of checks. Outlays during any fiscal year may involve payment of obligations incurred in previous years or in the same year. Such outlays, therefore, flow, in part, from balances of prior year Budget Authority and, in part, from authority provided for the year in which the money is spent.

Budget outlays in the loan account, net of write-offs, after offsets for repayments, are defined as net lending. All remaining budget outlays, which related to the expenditure account, are called expenditures.

The tables showing outlays in each functional field use these definitions and show outlays divided between expenditures and net lending. The summary tables in Chapter II also use these definitions. Because outlays for R&D conduct are entirely of an expenditure (rather than lending) nature, the term "expenditure" is used for R&D conduct.

Trust Funds. Trust funds are established to account for receipts which are held in a fiduciary capacity by the Government for use in carrying out specific purposes and programs.

Federal Funds. Federal funds are Government-owned funds, and are distinguished from Trust Funds.

Consolidation of Funds. Certain payments between funds are accounted for as expenditures of one fund and as receipts of another in financial statements that relate to the individual funds. When all funds are consolidated into a single schedule as in the budget, the duplication involved in the interfund and intragovernmental transactions must be eliminated. This is generally done by deducting the amounts involved from both the outlays and the budget authority for the agency receiving the payment. However, in a few cases where the payment is in the nature of a transfer of receipts, the deduction is made from the agency making payment.

*These notes are, for the most part, paraphrased and edited excerpts from The Budget.

In two situations the interfund and the intragovernmental transactions are not deducted from the figures of any agency or function, but appear as special deduct lines in computing total outlays. One of these situations constitutes the Government's payments as employer into trust funds for retirement of its employees. The other consists of the interest receipts of the trust funds.

Offsetting of Receipts Against Expenditures. All expenditure figures used in the budget are net of the following types of receipts:

- Refunds of previous erroneous expenditures, to the extent that statutes permit the money to be used again without further congressional action.
- Collections of revolving funds, management funds, and trust revolving funds.
- Reimbursements to appropriations where the law permits such reimbursements to be merged with appropriations.

Other receipts from the public (apart from loan repayments, discussed above) fall into two classes, treated as follows:

- Those that are collected because of the sovereign or other compulsory powers of the Government are reported as budget receipts. Gifts and contributions (as distinguished from payments for services or cost-sharing deposits by State and local governments) are also counted as budget receipts.
- Receipts which arise out of the proprietary activities of the Government - that is, interest, sale of property and products, charges for nonregulatory services, rents and royalties, etc. - are not counted as budget receipts, but are offset against expenditures in total for each agency and for each function.

Budget Authority. Government agencies are permitted to enter into obligations, requiring either immediate or future payment of money, only when they have been granted authority to do so by law. The amounts thus authorized by Congress are called budget authority. Such authority is related to the obligations expected to be incurred during the year for most accounts. In some cases, especially construction, research, and procurement, budget authority is requested and granted to finance the full cost of each project at the time it is started.

Budget authority is divided administratively between New Budget Authority (NBA) which pertains to the expenditure account, and Loan Authority (L-A), which pertains to the loan account.

Budget authority (both NBA and L-A) usually takes the form of appropriations which permit obligations to be incurred and payments to be made.

A section appears in each chapter on Congressional actions during the second session of the 90th Congress. The action referred to in these sections is with regard to Budget Authority. The reductions discussed are with respect to this concept rather than

estimated outlays. Although Budget Authority and Outlays are related to each other (and over a period of time will balance), in any one year Budget Authority may be either below or above estimated and/or final outlays which are actual disbursements rather than obligations.

Research and Development. As defined by The Budget, R&D includes activities in which the primary aim is either to develop new knowledge or to apply existing knowledge to new areas. Excluded from this definition are expenditures for routine testing, experimental production, information activities, technical assistance and training programs.

R&D Facilities. These expenditures include those for physical facilities such as land, buildings, and major equipment, regardless of whether the facility is to be used or owned by the Federal Government or by a private, State, or local organization.

R&D Conduct. All R&D expenditures, other than those for R&D facilities and major equipment, are included in R&D conduct.

As noted earlier, R&D disbursements are generally referred to as "expenditures" rather than "outlays" because they include no lending. This practice has been followed here.