Chapter VII

ANALYSIS OF POSSIBLE IMPACTS

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The range of possible impacts of improving the flow of materials information and analysis to public and private decision-makers is extremely wide. This assessment focuses on five broad impact areas judged to be most significant: Government, the economy, social institutions and behavior, international policy-making, and public law.

The impact analysis suggests the following conclusions:

- **The potential impacts of improvement in organization and integration of materials information systems in the Federal Government appear to be primarily beneficial, and the likely detrimental impacts in large measure are avoidable, controllable, or justifiable in the public interest.**
- **At the incremental level of improvement and change, all impacts appear to be minimal or marginal. Benefits appear to be of major or overriding significance, and costs appear to be negligible.**
- **At the intermediate level of improvement and change, many impacts could become significant. At this level and above, some of the potential impacts appear to be critical or of overriding importance relative to other trends in society, the Government, and the economy. And even those impacts which in the short-run are marginal or minimal may assume cumulative importance over time. Overall, potential benefits are judged to substantially outweigh any potential detrimental impacts.**
- **At the maximum level of improvement and change, several impacts could be very beneficial. However, at this level the possible detrimental impacts or costs could be significant enough to warrant very careful consideration of the trade-offs involved.**

A. INTRODUCTION

The range of possible long-term effects of improving the flow of materials information and analysis to public and private decisionmakers by establishing the integrated capabilities is extremely wide. This assessment focuses on five broad impact areas judged to be most significant, at least from the standpoint of national decision makers: the Government, the economy, social institutions and behavior, international policymaking, and public law.

To simplify the analysis where appropriate, institutional arrangements 1 and 2 (the Materials Information Referral Office and Materials Information Coordinating Board) will be considered together as institutional arrangements at the level of incremental improvement and change. Likewise, institutional arrangements 3 and 4 (the Bureau of Materials Statistics and Bureau of Materials Statistics and Forecasting) will at times be discussed together as institutional arrangements at the level of intermediate improvement and change. Finally, institutional arrangements 5, **6,** and **7** (the Materials Statistics Administration, Materials Statistics and Forecasting Administration, and Materials Information Commission) will frequently be considered together as institutional arrangements at the level of maximum improvement and change.

B. IMPACTS ON GOVERNMENT

Basic conditions and key trends determining the impacts on governmental processes include (a) the increasing complexity and criticality of materials supply and demand in a highly industrialized society, (b) the concomitant need for detailed information and statistical analysis, and (c) the importance of long-range forecasting to support contingency planning and materials policymaking,

In the area of governmental impacts, the potentially significant effects identified were:

- Support for governmental planning and priority selection;
- Increased ability of decisionmakers to cope with materials problems;
- Possible improvement in relationships between Federal, State, and local governments;
- Changes in the distribution of influence and responsibility among Federal agencies; and
- Support for increased public participation in decisionmaking.

1. Support for Governmental Planning and Priority Selection

Improving existing information systems could contribute needed support to the process of planning, definition of objectives, and priority selection with respect to materials policy. The importance of this contribution is very significant, although information is only one of many variables in the planning process, Acceptance and utilization of such improvements could take time to build. At the level of incremental improvement (systems approach A), impacts could be minimal because many responsible Government officials already are informed about available information and have established contacts with the collecting agencies. Thus, the Materials Information Referral Office could at most contribute some added convenience when new kinds of information are needed by an individual official. The Materials Information Coordinating Board, by adding more extensive improvement to collection/analysis activities in other agencies and the private sector, could marginally upgrade the quality and availability of information.

At the intermediate level of improvement (systems approach B), the Bureau of Materials Statistics could provide substantial benefits in terms of speed and convenience in procuring data and providing a more consistent statistical base for varied elements and sources of policy-making. The addition of forecasting **capability** through the Bureau of Materials Statistics and Forecasting could greatly increase potential benefits to governmental planners by permitting more consistency in the assumptions used for long-range planning by various agencies and the legislative branch, and could contribute to broader consensus on materials-related policy issues. The Bureau could provide a focus for the organization and integration of existing Government materials information systems, and could permit application of the materials cycle concept to support the policy-making process, On the other hand, if the statistical analysis function reveals disparities between actual resource allocation and relevant values held by interest groups, policy makers, or large segments of the public, there could be a short-range increase in political tensions and conflict as a result.

The arrangements involving maximum change (systems approach C), add to the potential benefits through stronger authority to validate data at the original source, How much benefit depends on the extent to which present data collection is found to be unreliable or misleading. The Materials Statistics Administration, although probably providing a large increase in the volume of statistical data (and forecasting and analysis for the Materials Statistics and Forecasting Administration) could detract from the policy-related activity in other agencies and locations by competing with them or aggregating from them some of the necessary supporting activities, However, the lack of forecasting and analysis functions in the Materials Statistics Administration, while perhaps minimizing disruption of related activities in existing agencies, may severely constrain its usefulness.

Thus there are trade-offs to be made in evaluating the relative benefits of this level of change. Whereas the Materials Information Commission might be more independent of executive branch policy constraints and thus be more useful to or more trusted by Congress, this same independence could lead to its removal from the mainstream of policy-related activities and cause duplication of many of its functions within both executive and legislative agencies and support organizations.

2. Increased Ability of Decisionmakers To Cope With Materials Problems

The ability of Federal-level decisionmakers to cope with materials-related problems depends in part on the quality and availability of information. Also significant are the availability of alternative materials and technology, the authority and responsibility of the Government to intervene in economic transactions, the public acceptance of such interventions, and the external restraints represented by the action of other nations or the degree of cooperation achieved domestically by industry and consumers. Thus, improvement in information flow could contribute significantly to the capability of understanding and analyzing problems and issues and also could aid in the ability to achieve solutions (e.g., with respect to the materials, energy, environmental and transportation implications of possible substitutes for imported aluminum or the development of solar-energy sources in the Southwest). Therefore, possible impacts on the solution of materials-related problems are closely parallel to the potential impacts on planning and priority selection. The forecasting and analysis functions which are included in the intermediate and maximum levels of improvement could afford significant benefits in situations where understanding of the scope and complexity of a problem (and its social, political, and economic implications) is essential, and where consensus must be reached quickly in key areas (e.g., reacting to a political crisis such as the oil embargo). In longer range problemsolving, where responsible officials are assumed at present to do their own forecasting and analysis, the benefits would again be in terms of the quality of analysis and consistency of forecasts.

3. Possible Improvement In Relationships Between Federal, State, and Local Governments

Impacts of improved materials information flow on intergovernmental relations probably will be significant, with most benefits likely to accrue to State and local planners and decisionmakers, especially in smaller States and localities with least internal resources for information gathering, analysis, and forecasting. At the incremental and intermediate improvement levels, State and local planners and decisionmakers could derive substantial benefits from the added convenience and ease of locating data in Federal agencies or in a new office or agency. And, they could benefit by the analysis and forecasts made available to them, as well as the support provided for improvement of their own data capabilities. This could enhance cooperation between levels of Government to the advantage of both. At the maximum change levels, these benefits could be outweighed by distrust or resentment resulting from activities arising through the additional authority to verify and validate data, from resistance to growth in the Federal bureaucracy, and possibly from disruption of established contacts in the existing Federal agencies,

4. Changes in the Distribution of Influence and Responsibility Among Federal Agencies

The distribution of influence, responsibility, power, and public visibility among Federal agencies will also be impacted by improvements and changes in materials information systems. Hence, indirectly, the oversight functions of some congressional committees will be affected as well as budgetary allocations to the affected agencies. These changes are of little interest to information users and to the public, but they may be of concern to Congressmen and are very important in determining the stance of agencies toward proposed changes in existing systems. Some impacts could be manifested even at the incremental level of change.

For the Referral Office, impacts could be confined largely to the parent agency which must establish and maintain the referral system, and to other agencies which will be asked to respond to the referrals themselves. This impact is limited to the need for new positions and support facilities, and to some incremental increase in public visibility and constituency for the parent agency. The Coordinating Board adds to the referral system the effort necessary for more extensive improvement of information systems in other agencies plus governmental support for improvement of private sector systems. Thus, there could be increased costs as well as benefits for other agencies, benefits (subsidies) for industry and possibly for universities and research organizations, and general public benefits from improved accessibility and quality of information.

At the intermediate level, the Bureau of Materials Statistics (or Materials Statistics and Forecasting) could represent a significant impact (increased responsibility and benefits) for the parent agency and some diminution of responsibilities, constituency, or budget for other agencies who will, however, still have their existing responsibilities for data collection and dissemination. At the maximum change level, however, creation of a new executive agency (an Administration for Materials Statistics or Materials Statistics and Forecasting) might create a new force in materials-related activities and constitute a significant loss of functions, influence, personnel, and constituency for existing agencies, Furthermore, the additional authority to validate data and determine procedures and classifications for its collection could create new demands and checks on other agencies, which will nevertheless still retain data collection functions, The Materials Information Commission is vested with authority to collect data, superseding some of the functions of other agencies. This institutional arrangement could obviously have the most significant im-

pacts. All arrangements within the maximum change level (and probably the intermediate level as well) require new legislation and thus could require new oversight and budgetary activities in Congress.

5. Support for Increased Public Participation in Decisionmaking

Conflicts between the public demand for information and the demand for protection of proprietary information on the part of industry could very likely arise,

At the incremental level of change, there could be small but beneficial impacts on public participation since a referral service (and, to a lesser extent, improvement in private information systems) could primarily benefit the public and private interest groups who lack the established contacts and relatively easy access to sources of information which governmental officials by and large already enjoy. The costs of providing this service to the public could be significant over time. Federal decisionmakers may reap secondary benefits, however, if informed participation is less apt to be suspicious, hostile, or counter to established governmental objectives than less informed participation. On the other hand, more available information may stimulate public interventions through court suits and administrative proceedings. Both possible outcomes are increasingly likely as statistical aggregation and analysis and official forecasts are made available (at the intermediate change level) and as the source of such information is more publicly visible (at the maximum change level, with a new executive or independent agency). The possible conflict between public demands for information, operating through the Freedom of Information Act, and the need for protection of confidential data and information sensitive to industry planning could become more acute at the intermediate and maximum levels, as stronger authority for verification of data is added.

C. IMPACTS ON THE ECONOMY

Among the possible economic implications are:

- Improved ability of the private sector to meet national needs for materials;
- Clarification of materials substitution and R&D options;
- Support for industrial planning;
- Changes in the competitiveness of the materials industry;
- Stimulus to governmental/industrial cooperation in materials policy development and implementation;
- Clarification of consumer choices; and
- Contribution to land use and regional planning.

Basic economic conditions and trends include the new concern about the ability of industry to meet national needs under possible conditions of limited resource availability, and new realization of the extent to which raw materials have become dependent on foreign sources. In addition, during the last decade pressure has developed to force industry to absorb what were hitherto regarded as external costs: environmental pollution and social welfare responsibilities, To the extent that reliable information is lacking, including credible statistical analysis and forecasts of supply and demand, standards and criteria may indeed be established which cannot be implemented or enforced or which place unreasonable burdens on some segments of the economy.

1. Improved Ability of the Private Sector To Meet National Needs for Materials

Adequate information is essential both to industry and to Government in trying to maintain the most productive balance between the basic role of industry in supplying raw materials and finished goods, and the responsibility of Government to support, regulate, and in some cases subsidize these activities. Industry is constrained in information gathering in four ways: (a) by its own resource limitations; (b) by the complexity and diffusion of Federal processes of information gathering and analysis (and policymaking, implementation, and related regulatory activities); (c) by the necessity of protecting proprietary information whose release would compromise the competitive position of individual corporations; and (d) by constraints imposed by antitrust legislation against the sharing of information, forecasts, and planning activities. The Government, however, can ease some of these constraints by centralizing and aggregating data in such a way that information affecting the competitive position of individual companies is protected.

At the incremental level of improvement of materials information systems, no additional data gathering is envisioned. Industry (in general) has established knowledge and sources of information so that a Materials Information Referral Office adds few benefits. Some assistance to the private sector and to agencies in improving data collection and classification is included within the mandate of the Coordinating Board, so with this alternative there could be small, long-range beneficial impacts. The additional statistical analysis and forecasting included at the intermediate level (the Bureau of Materials Statistics or Materials Statistics and Forecasting) could add significant beneficial impacts by providing industry with better information about the analytical basis and assumptions underlying evolving governmental policy, as well as supplementing the similar analyses carried on within the private sector.

At the maximum change level, a new executive branch agency could have stronger authority for verification and validation of data (and the Materials Information Commission would in addition have authorization for collecting data). At this level, the possibilities of conflict over protection of sensitive information, and the possibility of accidental or deliberate disclosure of such information to the detriment of corporations, could become acute, and new legislative safeguards would likely be needed.

To protect against the possibility of abuse of information or of excessive control over information, institutional arrangements at the maximum change level (the Materials Statistical Administration and Information Commission) are envisioned as having a number of checks and balances. The Freedom of Information Act assures that aggregated data will be available to all. Direct and continuous oversight by GAO and OMB and periodic review and investigation by congressional committees are provided, Except perhaps for the independent commission, all proposed arrangements could retain primary data collection activity in existing agencies, continuing the safeguards now provided by their charters and enabling legislation, In general, therefore, improvement of existing information systems could provide additional support to industry in meeting national materials needs, The improvements could significantly contribute to industry's capability in this area.

2. Clarification of Materials Substitution and R&D Options

Materials substitution requires effective forecasting of availability and costs; it also requires information about materials performance, Research and development programs may be necessary and must be initiated well in advance of critical needs. A flow of materials information, including both technical information and identification of ongoing R&D, is important to this process and has important implications for governmental policy makers as well as industry.

At the incremental improvement level, benefits could be relatively small but could still have long-range importance because of improvement of existing information systems (stimulated by the Coordinating Board), At the intermediate and maximum change levels, benefits could be much larger because of the added consistency and scope of statistical analysis of rates of development and consumption and forecasts of availability. The requirements for analysis and forecasting that would be provided by the Bureau of Materials Statistics and Forecasting, the Materials Statistics and Forecasting Administration, or the Materials Information Commission could be used to alert industry to impending governmental demands and constraints in time to incorporate this information into long-range corporate planning and investment strategy, The authority to validate information included in the arrangements for a new Administration or Commission, as applied to ongoing research and development and anticipating technological breakthroughs, could pose a particular threat to industry and require well-considered legislative safeguards as a part of any enabling legislation.

3. Support for Industrial Planning

The impacts on corporate planning are potentially important. Industry must now take into account a range of considerations far more extensive than the traditional criteria of profitability: national and international policies, worldwide economic fluctuations, political stability in developing countries, environmental and social impacts, consumer reactions, and changing employment patterns, among others. The development of technological forecasting since World War II is more recently being paralleled by corporate interest in social and policy forecasting. In these activities, as will be further discussed below, large corporations have a great advantage over smaller companies. Yet small companies may be particularly important to meeting national needs, especially in the area of exploring and opening up new materials sources and in innovation and technological breakthroughs, Improvements in materials information systems at the incremental level could have some benefits for small suppliers but little for larger corporations with an established capability for using all available sources of data.

At the intermediate level, benefits could also be proportionately larger for small firms with little capability for statistical analysis and forecasting. But at this level and above, benefits could also become significant for larger companies and multinationals by allowing them to mesh their own assumptions and planning with governmental forecasts of national needs, Direct benefits to governmental decisionmakers could also become significant because this meshing will facilitate implementation of stockpiling and long-range procurement planning. Clarification of the possible need for Government-stimulated or subsidized R&D could allow more efficient long-range allocation of research budgets, Again, however, validation of data as related to industrial investment planning requires sensitive legal safeguards.

4. Changes In the Competitiveness of the Materials Industry

As indicated in the discussion of industrial planning, the disadvantages of small firms relative to large firms could tend to decrease by improving their access to existing data sources (at the incremental change level) and by supplying basic statistical analysis and forecasts (at the intermediate and maximum change levels), Indirectly, on the other hand, the tendency to use the same basic forecasts and analysis, as supplied by the institutional arrangements with these capabilities, could to some extent have the same effect as collusion among the giant industries in the field, and could discourage small firms from high-risk ventures which they might otherwise undertake. At the maximum change level, the crea-

tion of a new Administration or Commission might intensify industry fears of centralized governmental planning and intrusion of Government into the private sector. There is also, allied to the new authority to validate data, an increased possibility of efforts to influence governmental officials for purposes of abuse of confidential information.

5. Stimulus to Governmental/Industrial Cooperation in Materials Policy Development and Implementation

These potential impacts also relate to Government and industry cooperation in materials policy development and implementation, The traditional view has been that extensive cooperation was not desired and was indeed suspect except in defense and heavily regulated industries, The long-range trend, however, is toward increasing interdependence of the public and private sectors in deci - sionmaking because of the pressure on resources, the growing complexity and interrelatedness of the national economy, and the increasing costs of technology and of research and development. Public pressure and the need for an image of social responsibility have also brought about decreased resistance by industry toward absorbing what were hitherto considered externalities or social costs.

Aside from the benefits of governmental assistance in improving existing public and private sector information systems at the incremental change level, there will be an additional stimulus to business/Government cooperation through the shared use of assumptions based on the statistical analysis and forecasting capability of the Bureau of Materials Statistics and Forecasting, the Materials Statistics and Forecasting Administration, and the Materials Information Commission, The use of the materials cycle concept as the focus of analysis at the intermediate and maximum change levels, for example, is a rich basis for govern mental/industry cooperation in policy formulation to the advantage of both, As already noted, however, the perception of increased governmental activity and involvement in materials supply/demand planning may in some industrial quarters raise strong fear of increased constraint and regulation and loss of the advantages of confidential information.

6. Clarification of Consumer Choices

Improvement or change in materials information systems should have little significant direct impact in the area of consumer behavior, other than to clarify choices. There is increased sensitivity to health, safety, and environmental impacts on the part of consumers, and increasing selectivity among products on the basis of rising costs, But consumer choices are determined by many variables, and detailed information about materials is probably an important factor only in a small minority of cases, Establishment of a Consumer Protection Agency which might draw on the materials information either through the referral service or the clearinghouse function could increase impacts somewhat; otherwise, use of the information by individual consumers will probably not be large, except perhaps with a small group of highly motivated and informed consumers,

7. Contribution to Land Use and Regional Planning

The impact on land use and regional development could be significant in development of land use plans, Land use planning is steadily increasing as the long tradition of emphasis on growth has come into conflict with environmental concerns (and rising land prices). Wise land use planning includes consideration of the relative desirability of alternative uses, including minerals development. However, materials needs at the national level, regional objectives for economic development, and local environmental values

imply complex trade-oft's which must be adjudicated or mediated between public and private sectors, different regions and States, and different levels of Government.

Impacts at the incremental level of improvement could be minimal, resulting only from additional convenience in locating data by local officials (who are generally already informed about existing sources) and improvement in agency and regional or private sector information systems. At the intermediate and maximum change levels, statistical analysis capability could be of significant assistance, as could forecasting. But in the latter case, local authorities are apt to treat national forecasts skeptically where such forecasts conflict with local perceptions or priorities. The new Administration or Commission proposed in the maximum change levels could have minor short-range detrimental impacts by disrupting established contacts between agencies and local authorities,

D. SOCIAL IMPACTS

In the area of social impacts, the following potential effects were identified:

- Improved materials information management;
- Increased access to materials information;
- Concern over privacy (individual and corporate) and control of information;
- Movement toward futures research and interest in alternative futures;
- Media treatment of materials-related national problems;
- Public understanding of materials-related national problems; and
- Education and curriculum development in materials-related areas.

1. Improved Materials Information Management

At the incremental change level, the Materials Information Referral Office could provide only marginally additional ease of access to information/materials specialists who already have established access to existing sources of data. Improvement in agency materials information systems and private sector systems could be supported by the Coordinating Board, and could be beneficial, as could the statistical analyses and forecasts available through various institutional arrangements for intermediate and maximum change. The authority to validate data and collect additional data (at the intermediate and maximum levels) could add to the information load of all existing systems and must therefore be counted both as a benefit and a cost.

2. Increased Access to Materials Information

Access to information has become more important as the demand for public participation in decisionmaking (through hearings, law suits, and other modes of public intervention) has increased. Under the access policies represented by the Freedom of Information Act, any improvement in existing systems beginning at the incremental change level, could mean progressively larger demand for service to the public at large, especially to public interest groups. Public demand could be further stimulated by the higher visibility inherent in a new Bureau or Administration at the intermediate and maximum change levels. This service may be costly. As already noted, the statistical, forecasting, and analysis capabilities could also increase demands for full access from the industrial and research sectors and from other Government agencies. To some extent,

however, demands on existing agencies could be relieved at the intermediate and especially at the maximum change levels, although demands might be increased over present levels at the incremental change level as the referral service could tend to stimulate requests for access to agency information.

Improved access to information in the sense of quality and scope of data could increase significantly at the intermediate and maximum change levels. Through validation of data presently provided by the private sector and by the authority to collect new data independent of existing sources, the maximum change alternatives (new Administration or Commission) could offer the prospect of the greatest improvement in the quality as well as the level of access.

3. Concern Over Individual and Corporate Privacy and Control of Information

Privacy and control of information is a sensitive area of potential impact. The increasing use of integrated, computerized data banks has led to great concern over the possibility of abuses and to attempts to provide legal safeguards (e.g., the Privacy Act of 1974), Personal privacy is unlikely to be affected by any currently proposed changes in materials information systems. There are possible impacts on corporate privacy (control of "proprietary" information), but these are not relevant at the incremental level of change, However, the actions of the Coordinating Board could, over time, lead to redefinition of classification and standards of data collection by stimulating and supporting incremental improvement in existing information systems. Danger to corporate privacy is minimized in arrangements creating a new Bureau or Administration. While there is added authority to validate raw data collected by Government agencies, the original authority and responsibility for collection of data remains in existing sources. Those Government agencies which now collect, aggregate, and disseminate data will continue to do so under laws and regulations which appear to provide adequate safeguards.

The authority to validate information at the original source, which is added in the maximum change level (a new Administration or Commission), is the first of two sensitive points. Some safeguards against erosion of corporate privacy are assumed. Application of safeguards in existing statutes (the Freedom of Information Act and the Privacy Act). direct monitoring by OMB and GAO, oversight by congressional committees, and court action. Protection can be built into the systems technically, but additional legal safeguards may be needed, The second sensitive point is the authority provided for the Materials Information Commission to collect new data independently of existing sources and maintain a detailed data base, This data bank may well expose information presently held only by private sector corporations and considered confidential. Aggregation of data may not be sufficient to prevent some detrimental impacts on corporate competitive positions (or public image), and careful trade-offs will have to be made between public and private interests in this area.

A related impact area is possible stimulation of the growth of interconnected data banks and retrieval systems. These impacts could be minimal at the incremental change level, although the Referral Office could be interconnected with search and retrieval systems in the public and private sectors, and thus stimulate wider use of such systems, Improvement of existing materials information systems through actions of the Coordinating Board could have a similar stimulating effect, and in fact could be necessary before interconnection between agency information systems (now in early stages of discussion or development) is thoroughly feasible.

The summary data bank envisioned for a new Bureau (at the intermediate change level) or for a new Administration (at the maximum change level), and even more specifically the

detailed data base to be developed by the Materials Information Commission, could ultimately have direct access to and from agencies. Given the summary data base, interconnection between the new agency, executive and congressional policymaking, and policy analysis offices (OMB, CBO, OTA, GAO, CRS, and even congressional committee offices), or between the new agency and State and local agencies and Federal field offices appears feasible, The detailed data base envisioned under the Commission arrangement could make such interconnections a necessity.

4. Movement Toward Futures Research and Interest in Alternative Futures

Futures research and public attention to the discussion of alternative futures for the United States is a growing movement deriving from wide perception of an increasing rate of social change and uncertainty about conditions perceived as outside individual control. This policy-oriented attention to future options began in academic/professional/research circles (as evidenced by the rapid growth of the World Future Society, and the establishment of a number of "futures" journals). More recently it has begun to be institutionalized in the Federal Government (CRS has a futures study group, and congressional committees are now required to give increased attention to futures options). A number of States have established commissions or committees to conduct analysis or lead discussions of alternative futures for the State or region.

The impacts on the movement toward deliberate design of future options (both within the Government and in the larger public forum) could become significant over the long range. This is most likely at the intermediate change level with the addition of forecasting capability (the Bureau of Materials Statistics and Forecasting), and especially with the added visibility gained through the establishment of a new Administration or Commission at the maximum change level. Emphasis on the materials-cycle concept could also help to raise the level of discourse on alternative futures.

5. Media Treatment of Materials-Related National Problems

Media treatment of materials-related national problems is increasing, but is often marked by a lack of depth and sophistication or by polemical rather than balanced analytical treatment. The media are perhaps the major stimulators of political debate in the United States and often serve to identify emerging national problems, at least for the public, to influence or constrain the definition of policy issues, to inject expert or scientific opinion into the public discussion, and to educate the public about possible responses (e.g., energy conservation). Increasingly, a portion of the print media is becoming specialized to meet the demands of the newly concerned public for information about emerging national problems (e.g., environmental affairs journals, consumer affairs journals).

While improvement of materials information systems would support media attention to materials-related problems, this impact could perhaps assume immediate significance only at the maximum change level. Here, the establishment of a new Administration or Commission could focus media attention on materials problems with a newsworthy event, and over time the media could tend to develop media specialists to deal with that agency. At the intermediate level of change, however, there could be longer range development of margin a 1 impacts because the media, especially the specialized print media, could tend to use materials statistical analyses, forecasts, and analyses only to a limited extent, However, the materials-cycle concept

alone, if picked up by the media, could itself lead to a new organizing principle or framework for materials-related public affairs programming.

E. IMPACTS ON INTERNATIONAL POLICYMAKING

The following areas of possible international impact were identified:

- Awareness of need for international materials information;
- Operation of multinational corporations;
- Increased ability to cope with international materials cartels;
- Improved basis for foreign policy on materials and trade;
- Stimulation of the use of satellites for information purposes; and
- Support for international discussion of materials-related problems.

1. Awareness of Need for International Materials Information

Awareness of the need for international materials information will be increased by improving materials information systems. Historically, the advanced industrial nations have acquired much of their raw materials from less developed nations. International policy has been oriented toward protecting American foreign investment. But the post-World War II rise of nationalism, and rising resentment over the gap in standards of living between developed and developing nations, has decreased the relative economic leverage of the United States. Developing nations are exerting control over their resources through nationalization of foreign investments, cartels, tax policies, and so forth, The U.S. policy is moving toward commodity agreements rather than a free trade posture, Multinational corporations already benefit greatly from their access to information about materials in many countries, but other U.S. industries as well as the U.S. Government have an increasing need for foreign materials information,

At the incremental level of improvement, benefits could accrue more to foreign governments and corporations (to the extent that they can use the referral service) than to U.S. industry. Even if there is exchange of information, the United States probably maintains more comprehensive materials information than most other countries. At the intermediate and maximum change levels, however, the clearinghouse function could make it significantly easier for U.S. industry as well as policy makers to obtain information about many countries from one source. The data could also be incorporated into statistical analysis and forecasting, A new Bureau, Administration, or Commission (and perhaps even the Coordinating Board) could have some authority or, at the minimum, influence to improve categorization and classification of national security information related to materials. This may have the long-range result of declassifying some information currently not available to the public or even to civilian analysts and policy makers. However, should foreign governments and industry be reluctant to provide information, the net effect could be to the disadvantage of domestic competitive interests, This might in turn generate proposals for limiting foreign access to information.

2. Operation of Multinational Corporations

In the area of materials, many multinational corporations have scope, resources, and scale second only to national governments, Improving the materials information systems is likely to have little impact on the operations of the

multinationals, or little benefit for them, except that by checking their own forecasts and analyses against that of an integrated systems, they may have a common basis for planning and for reacting to crisis in conjunction with or as a response to national policies. In a sense, this could benefit multinational corporations by making the "rules of the game" more explicit. However, the more significant impacts may be benefits to U.S. policy makers in increasing their capability to understand the operations of multinationals.

3. Increased Ability to Cope With International Materials Cartels

There may also be impacts on the formation and operation of international materials cartels (combinations of suppliers with control over supply and/or price of materials). The OPEC experience has led to fears of similar actions in regard to other materials for which the United States is dependent on less developed countries, for example, the pricing actions taken by the International Bauxite Association. Improved requirements for statistical analysis and forecasting and for gathering and validating information (at the intermediate and maximum change levels) could assist in developing strategies and contingency plans for coping with these situations in advance of their occurrence.

4. Improved Basis for Foreign Policy on Materials and Trade

Linkages of materials policy with foreign policy and national security policy are critical, involving the need for information about alternative foreign sources of materials, the effects of technology transfer, and foreign aid. Other areas of concern include stockpiling needs, substitution possibilities from domestic sources, trade and investment patterns, and the potentials of conservation and recycling. Again, integrated capabilities for statistical analysis and forecasting and for validating information could provide significant assistance at the intermediate and maximum change levels, and the use of the materials cycle concept may become a useful basis for preparing for international negotiations about materials and trade.

5. Stimulation of Use of Satellites for Information Purposes

The use of domestic and international satellites for developing materials information may receive some stimulation from establishing the integrated capabilities and the authority to validate information at the maximum change level, Remote sensing, including the Earth Resources Technology Satellite (ERTS)—now called LANDSAT—is chiefly useful for cataloging above-ground resources. This technology has aroused international controversy over possible erosion of control over national resources by less developed countries, Use of satellite technology by a highly visible new Administration or Commission to validate existing data or gather new data could increase the fearful perception by other countries of increased U.S. control over information to serve our own purposes, However, the benefits of international use of ERTS could be strengthened by improved data criteria and classification and by widespread use of the concept of the materials cycle as a structuring principle.

6. Support for International Discussion of Materials-Related Problems

The United Nations' Organization for Economic Cooperation and Development, and other international organizations (including nongovernmental organs such as the International Institute for Applied Systems Research and the Society for General Systems Research) are increasingly active in the area of materials information and related educational activities.

For example, in 1974, the UN sponsored a Sixth Special Session on "Raw Materials and Development, " and OECD is currently surveying member countries on materials policy and R&D priorities, It is likely that international discussion of materials-related problems could be supported by and also contribute to data incorporate in the integrated capabilities.

F. IMPACTS ON PUBLIC LAW

The possible legal impact areas considered include:

- Submission of materials information by private sources and validation of materials data by Government agencies;
- Exchange of materials information by Government agencies;
- Application of the Freedom of Information Act to data in materials information systems;
- Revision of reporting requirements for materials-related industries; and
- Promotion of other national policies and programs.

1. Submission and Validation of Materials Data

At present, Government agencies rely primarily on voluntary compliance with their requests for materials data by private sector sources. While many agencies possess the authority to compel reporting of materials data, few agencies are vested with full power to obtain validation of data submitted beyond mere visitational authority.

In recent years, recognition of the effects of corporate activities on national interests has led to new reporting and disclosure requirements on private industry, such as those found in environmental and safety legislation (e.g., the National Environmental Policy Act and the Occupational Health and Safety Act) as well as economic and energy legislation (e.g., the Economic Stabilization Act, Federal Energy Act, and the Energy Supply and Environmental Coordination Act). Such legislation deliberately confers extensive investigatory and enforcement power upon relevant agencies, and some of the current legislative proposals for materials information systems could continue this trend,

No change in existing agency mandatory authority is contemplated at the incremental and intermediate change levels (Referral Office, Coordinating Board, or New Bureau). Consequently, no direct impact could arise from implementing these arrangements. However, some minor indirect impacts may result from establishing a Coordinating Board or new Bureau, as changes in agency data collection practices are made to accommodate the needs of the information systems and as increased and more detailed requests for information are sought from the materials industry, Any reluctance by industry to comply voluntarily may cause agencies to exercise existing authority to compel disclosure and validation and to seek additional mandatory power where necessary,

Institutional arrangements at the maximum change level (a new Administration or Commission) call for expansion of Government authority to validate data submissions at the original source. In addition, as at the incremental and intermediate change levels, increased use of existing powers of relevant agencies may be expected as the integrated capabilities are developed, with expansion of other agencies' mandatory authority (a possibility in the face of any damaging noncompliance by industry).

Authority of the Materials Information Commission could actually supersede the authority of existing agencies for data collection and validation, thus consolidating most statistical responsibilities in a single agency. However, this would not necessarily mean a further increase in the collection and validation powers of the Government, since the actual data collection could remain primarily with existing agencies and could be subject to existing protections of data sources.

2. Exchange of Materials Information by Government Agencies

Under existing institutional arrangements, many different Government agencies are involved in the collection and analysis of materials information, resulting in duplication of information and discouragement of cooperation between agencies. Some efforts have been made to eliminate a portion of this costly overlap. However, many existing laws, regulations, and practices create absolute barriers to sharing of information between agencies,

The commodities information program administered by the Department of Commerce illustrates the problems of interagency cooperation. Commodities statistics are collected and analyzed by various offices in the Departments of Commerce, Agriculture, and Interior. Additional economic information is obtained from the Departments of Labor and Treasury. All of this information is then used by the Department of Commerce in its economic publications and analyses. But other agencies seeking data used in compilation of these reports have limited access, and must obtain the necessary information independently from the original sources.

The result has been that repeated and often burdensome requests for information by Government agencies have in turn generated complaints from business. Some restrictions to information exchange were of course created by legislative or administrative action to promote cooperation by private sources through guarantees of absolute confidentiality and anonymity of individual data, and through strict limitations on access and use of the data by Government officials.

But as illustrated above, one effect of the restriction is to increase the burden on the Government in seeking disclosure of corporate information. Even Congress is prevented by these restrictions from obtaining information necessary to its oversight and lawmaking functions. New legislation has recognized this problem, and the current trend is to allow agencies access on a discretionary, case-by-case basis through appropriate request to the holder of data,

At the incremental change level, the Materials Information Referral Office could have only a minor indirect impact, if any, on information exchange, since most current Government users of such information already know the location of the data sought. Likewise, the impact of the Coordinating Board, if any, could be minor and indirect. Use of materials information under existing conditions of interagency exchange could be aided by improvements in comparability and standardization of agency data bases.

Institutional arrangements at the intermediate change level could have a significant impact on the actual exchange of information between agencies to accommodate new Bureau operations. The Bureau would require the continuing cooperation of different agencies in the collection and submission of materials data for use in the summary data base and as input to the referral and statistical capability, Some discretionary revision of existing regulations and policies would be required. But, since both arrangements represent essentially statistical uses, the required information exchange could be accommodated under existing restrictive statutes.

Another minor but direct impact of a new Bureau is on laws restricting access to original

data sources for validation purposes by personnel from outside agencies. Any conflict with existing law could be addressed in the enabling legislation for the Bureau. Alternatively, existing law could be interpreted as consistent with provisions of the Federal Records Act which, under certain conditions, expands access to include secondary users of restricted data as long as protection of the original data sources is maintained,

At the maximum change level. a new Administration could have impacts similar to those described for a new Bureau, with the additional possibility of minor institutional disruptions (since the Administration would have authority to determine the conditions of information exchanges and necessary changes in other agency data bases). Opportunities at this level are greater for direct conflict between enabling legislation and existing statutes which vest certain discretionary authority in collecting agencies. The Materials Statistics and Forecasting Administration has the additional dimension of access to forecasting and analytical information which in some sensitive areas, may meet with assertions of executive privilege and national security. Should such conflicts arise, their resolution may require court action or specific legislation and in the interim may cause minor disruption in some operations.

The Materials Information Commission could cause significant institutional disruption accompanying the likely modifications in Government materials data-collecting activities. Existing patterns and arrangements of materials data exchange could probably be replaced or revised. Comprehensive authority for data collection and validation would be placed in the Commission, with a reduction in the corresponding authority of other agencies. However, agencies would retain most responsibilities for actual collection of data, release of which to the Commission would be within relevant agency discretion, On the other hand, the Commission could exercise discretion over release of its own primary data to other agencies, Restrictions on disclosure of and access to Commission data thus could be a major and recurring issue.

3. Application of the Freedom of Information Act to Data in Materials Information Systems

The Freedom of Information Act (5 U.S. C. 552) affirms the right of any person to inspect and copy any Government information, documents, or record', with several snatnory exceptions, Data would, thus, be subject to the provisions of the Freedom of Information Act unless covered by a specific exemption, The major exemptions are those for privileged and confidential financial information submitted by a person, trade secrets, or other information exempted from disclosure under a specific statute, Current judicial trends have limited use of these exemptions. Confidential information is protected from disclosure only where disclosure would impair the Government's authority to obtain such information in the future or where disclosure of financial information would cause substantial harm to the respondent's competitive position,

Where a specific statutory exemption exists, even solely discretionary exemptions, the courts will generally uphold agency discretion. However, where only part of a document or record is protected, the exempt portion will be deleted and the remainder made public. Often, mere deletion of identifying information is sufficient protection for disclosure of remaining information which would otherwise be held confidential,

Under all arrangements with the increased availability of materials information, requests under the Freedom of Information Act can be expected to increase as discussed previously in the social impacts section,

Arrangements at the incremental and intermediate change levels (Referral Office, Coordinating Board, or new Bureau) could have no direct impact on freedom of information, Existing standards and exemptions could continue to apply with a policy in favor of disclosure, while at the same time maximizing

protection of individual respondents. Some differences in disclosure decisions may be expected under the separate policies and statutes governing original collecting agencies. which may be resolved through agency action or legislation as needed.

In addition. specific statutory exemptions covering data could he enacted as part of authorizing legislation or appropriations acts. However, such special exemptions could limit access to data and may therefore be inconsistent with both freedom of information and the overall policy of open access.

Arrangements at the maximum change level (a new Administration or Commission) could have their own discretionary and statutory exempt ions, possibly placing 1imits on FOIA disclosure requirements. A desired major impact of all arrangements (except for the Referral Office) could he the necessary development (through legislation, regulation, and/or court action) of specific standards of confidential it y for sensitive materials information to the ultimate benefit of all parties.

4. Revision of Reporting Requirements for Materials-Related Industries

During the past seven decades, there has been increasing Government interaction with private enterprise in areas of corporate structure and finances, health, safety, labor relations, environment, energy, and raw materials, among others. The integrated capabilities could likely have some impact on Government involvement in the materials industry. At the least, a revision of and perhaps an increase in Government reporting requirements for data from materials corporations can be expected, This impact could range from minimal for the incremental change arrangements to perhaps quite substantial at the maximum change level. Government/industry interaction could also be expected to increase with respect to the administration and operation of materials information systems in general, the development of reporting mechanisms, and the setting of standards of confidentiality and public disclosure.

The improvements in knowledge of the materials industry may indirectly lead to other Government actions such as greater regulation of scarce materials, Federal incentives for development of critical resources, and changes in management policies of federally administered mineral and agricultural resources.

5. Promotion of Other National Policies and Programs

The energy crisis spurred investigations by various Federal agencies and congressional committees with respect to fuel resources and consumption. Results of these investigations showed lack of detailed, independent Government information on critical fuel materials.

The establishment of a materials monitoring apparatus may indirectly contribute to extending this national concern to other critical materials. The availability of comprehensive materials information to all branches of Government, business, and the general public could be expected to some extent to raise the level of consciousness of the general materials outlook. Should serious shortages be revealed, there could likely be greater pressure for corrective action under existing law and for new legislation. Arrangements at the incremental change level are least likely to have this kind of impact. While the likelihood is greater for arrangements at the intermediate and incremental change levels, in every case the impact will depend upon the extent of development and use of the integrated capabilities.

Another result may be to facilitate the application of existing laws which require advance consideration and planning of major Government and industry projects. Examples include the National Environmental Policy Act and land use planning statutes. Comprehensive data on national materials needs and resources could be used to make informed choices between competing values and interests, thus furthering the decisionmaking policies inherent in such legislation.

G. IMPACT OF ALTERNATIVE LEVELS OF IMPROVEMENT

1. Incremental Level

Arrangement 1 (Materials Information Referral Office) envisions the establishment of a materials referral service in a new or existing office of an existing materials-related executive agency. Through this service, users can locate existing information sources and data in that and other agencies and the private sector. No major impacts of this incremental level of improvement were found. There could be some added convenience for congressional staff; new users within agencies (who will not yet have made their own agency contacts); smaller U.S. firms; foreign industry and Government officials; public interest groups (or the general public) who have not yet developed expertise; and students, teachers, and researchers.

The Referral Office could tend to stimulate demands on existing information systems, and could marginally improve accessibility to such systems. Requests under the Freedom of Information Act can be expected to increase. Dollar costs could be relatively low, but the parent agency could require new positions and funds and could experience some incremental increase in public visibility and constituency.

Arrangement 2 (Materials Information Coordinating Boards) adds to the above the authority to facilitate information exchange by assisting other Federal offices and agencies to improve their own data classification and storage, developing governmentwide goals for standardized and compatible information systems, and providing governmental assistance for related improvements in the private sector. This could add some small but perhaps significant benefits for users inside and outside Government, for example, assisting a Federal agency to further develop its materials-related data collection or assisting State agencies or private firms just developing such collections. Development of standardized and compatible systems could tend to stimulate computerized interconnection between Federal agencies.

Thus arrangements at the incremental change level could lead to a marginal improvement in support for governmental planning and priority selection, and could moderately strengthen the ability of Federal officials to cope with materials-related problems. These arrangements could aid in the interagency exchange of materials information, and could stimulate some possible revision in reporting requirements for data from the materials industry.

Improved information services, if used by the private sector, could make a small but significant contribution to industrial planning and clarification of substitution and R&D options. Parallel improvements in the congressional agencies (e.g., CBO, CRS, GAO) could upgrade the information support available to Congress for materials policymaking. Thus, overall, there could be benefits (as well as dollar costs) for both executive and legislative agencies, benefits for industry and possibly for universities and research organizations, and general public benefits from improved accessibility and quality of materials information.

2. Intermediate Level

Arrangement 3 (Bureau of Materials Statistics) calls for establishment of a materials information office within an existing agency, The office will have a “clearinghouse” function (to provide data collected and analyzed by other agencies directly to users) as well as the referral service, and a statistical capability with a summary data base, The office will have some authority to check and verify information provided by other agencies, as well as the responsibility for improvement of existing systems provided in arrangement z.

The statistical reports will supplement those already produced in several agencies, thus providing some additional benefits for Federal policy analysts and decisionmakers. By making such statistics generally available, it could

provide larger benefits to the private sector, chiefly to smaller firms who do not presently support this activity on their own. The net effect may tend to offset the information disadvantages of small firms relative to larger corporations. Similar benefits could accrue to public interest groups, and the public at large might be assisted (through the intermediary activities of the media and educators) to a better understanding of materials-related problems and the rationale behind governmental policy and proposed actions. This assumes that the media and educators will tend to use such statistical reports in the same way cost-of-living and unemployment figures are now used.

Perhaps as important, the bureau could provide a focus for the organization and integration of existing Government materials information systems and could permit application of the materials cycle concept to support the policymaking process. The new bureau could represent a significant impact for the parent agency, in terms of increased responsibility, budget, and constituency. While other agencies will still retain existing responsibilities for data collection and dissemination, they may perceive the bureau as representing a potential loss of relative influence and public visibility.

Arrangement **4** (Bureau of Materials Statistics and Forecasting) adds to the above the responsibility and authority for producing forecasts of materials supply and demand, and further analytical support for planning and policy formulation. By allowing all agencies and also industry to check their own projections against—and mesh them with—the bureau's forecasts, substantial benefits could accrue, particularly in contingency planning for materials shortages where concerted actions in the public and private sectors will be advantageous. It should be noted, however, that consistency in forecasts can have in some situations the effects which antitrust legislation is designed to avoid, that is, noncompetitive or even collusive activity among business enterprises, An indirect, small but cumulative impact of the forecasting function could be to support and stimulate the present movement toward research on and discussion of alternative futures,

The addition of forecasting and analytical requirements could greatly increase potential benefits to governmental policy makers by providing more consistency in the assumptions used for long-range planning by various agencies and the legislative branch, and thereby potentially contribute to broader consensus on materials-related issues. These requirements could add significantly to the ability of Federal decisionmakers to understand and analyze materials problems. Federal decisionmakers may reap secondary benefits if the new requirements lead to more informed public participation which is less apt to be hostile to governmental objectives. On the other hand, more available information may contribute to public interventions through court suits and administrative proceedings. And local government officials are apt to treat national forecasts skeptically where such forecasts conflict with local perceptions or priorities,

For the private sector, the forecasts and analysis could aid in industrial planning, clarify materials substitution and R&D options, and could provide a broader basis for Government/industrial cooperation in materials policy development and implementation. However, the perception of increased governmental activity and involvement in materials supply/demand planning could in some industrial quarters raise fears of increased constraint. regulation, and loss of proprietary information. The latter concern may be accentuated by the possibility of computer interconnection between the summary data base and other executive and legislative agencies. Conflicts between the public demand for access to information and the demand for protection of confidential information on the part of industry could very likely arise. Development of specific standards of confidentiality y for sensitive materials information will likely be stimulated,

3. Maximum Level

Arrangement 5 calls for the establishment of

a new executive agency (here called the Materials Statistics Administration). Arrangement 6 (Materials Statistics and Forecasting Administration) is similar, but adds forecasting and analysis to the clearinghouse/referral, statistical, and data processing and collection capabilities of arrangement 5. In addition, both arrangements provide for authority where necessary to verify data at the original source of collection.

A new agency obviously implies much greater costs in money and manpower than the incremental and intermediate levels of change. It also implies much higher visibility and probably much more responsibility and influence for materials information than would be the case for an office in an existing agency. And a new agency could exhibit a much stronger tendency to aggregate materials information and analysis. Establishing a new agency could create a new force in materials-related activities and may constitute a significant loss of influence, personnel, and constituency for existing agencies. Additional authority to determine procedures for collection and validation of materials data might lead to new demands and checks on other agencies.

Conflict between public requests for information, under the Freedom of Information Act, and industry demands for protection of sensitive and confidential information could become more important with a new agency. The agency's independent collection and validation authority will require appropriate safeguards for protection of data prior to its aggregation into a summary data base.

At the level of visibility, activity, and influence associated with a new agency, the production of forecasts and analysis could serve to alert the private sector to impending policy developments and constraints—including possibilities for regulation or for subsidy where such are needed-early enough for industry to respond on a timely basis. An important impact at this level could be a strong stimulation for long-range and contingency planning and priority selection in both the public and private sectors, This in turn is likely to arouse controversy over the role of the Government in economic and social planning, Nonetheless, the establishment of a new agency could likely contribute to industry's capability to meet national material needs through improved business planning and clarification of substitution and R&D options,

The high level of analytical support capability and the provision of the summary data bank could provide major benefits to policy makers in a wide range of areas, from stockpiling and materials conservation to international trade negotiations and national security affairs, In all of these areas, however, information (and forecasts of supply and demand) is only one of many variables; therefore the impacts, while often significant, are in most cases cumulative over time and must be kept in perspective. For example, benefits to State and local decisionmakers may be outweighed by distrust or resentment of Federal involvement, resistance to growth in the Federal bureaucracy, and possibly from disruption of established contacts in the existing Federal agencies.

Arrangement 7 (Materials Information Commission) differs from other arrangements at the maximum change level primarily in two ways: it proposes that the new agency be an independent agency rather than an executive agency, and it also proposes additional authority for collection of data as needed for the development of a detailed data base, in some cases superseding the activities of existing agencies, It should again be noted that in all other arrangements, data collection (as opposed to accessing, categorizing, classifying, disseminating, and in some cases analyzing) remains the responsibility of existing agencies and falls under the existing safeguards and restrictions imposed by their enabling legislation, A commission would likely be more independent than the other arrangements but would have at least three possible disadvantages. Oversight by OMB might be avoided, and oversight by congressional committees might be reduced. Also a commission might be

somewhat out of the mainstream of policymaking activity, and its activities could therefore tend to be duplicated within executive branch agencies. Finally, significant institutional disruption is possible since existing patterns of data exchange and reporting requirements and procedures will be subject to major revision.

H. OVERALL SUMMARY OF IMPACTS

This overall summary suggests which potential impacts of the institutional arrangements are likely to be most important to society, and whether these impacts are likely to be beneficial, mixed, or detrimental. Thus, the summary reflects both the magnitude and direction of impacts.

The first dimension, magnitude, is an analytical judgment based on the detailed impacts of identification and analysis of earlier sections. On the other hand, the direction of impact, while also based on the specifics of the analysis, is essentially a value judgment when viewed from the perspective of society as a whole. In the U.S. political system. the Congress and the President, as representative of the people, are the ultimate arbiters of social value, and have the responsibility to reach an overall judgment of social benefit and cost of the arrangements,

1. Impacts Judged To Be Beneficial

The most important beneficial impacts are manifested at or above the intermediate level of improvement and change represented by the Bureau of Materials Statistics and Forecasting. These impacts include:

. General strengthening of the Federal Government's capability to forecast shortages and crises, make contingency plans, and thus better understand and deal with materials-related problems;

. Substantially improve integration and organization of existing Federal Government materials information systems so as to provide better support for materials policymaking:

. Contribution toward a growing capability and tendency for identification of objectives and priority selection in the materials-related policymaking functions in both Government and the private sector; and

. Contribution to the capability of the industrial sector for short- and long-range corporate planning, including clarification of materials substitution and R&D options, as a basis for meshing corporate plans with the needs of society as perceived by Federal policy makers and for generally strengthening private sector capability to meet national materials needs.

Additional cumulative and important impacts (also judged to be beneficial) include:

- Reduction in the information disadvantage of smaller firms relative to larger firms;
- Increased public access to information;
- Increased public understanding of materials-related problems through the media and educational institutions:
- Improvements in materials-related public affairs programming and curriculum development through application of the materials life-cycle concept; and
- Opportunities for both intergovernmental (Federal-State-local) and international cooperation in materials problemsolving.

2. Impacts Judged To Be Mixed

Certain potential impacts must be viewed as

beneficial or detrimental in relation to an observer's values. Many of the potential impacts point toward an overall stimulation of planning processes in the mixed U.S. economy, with a higher degree of cooperation between Government and industry, particularly large corporations, Another possible impact is increased opportunity for monitoring the materials-related activities of both business and Government. Similarly, some will welcome and others will view with alarm the likelihood that more fully integrated materials information systems will lead to greater use of computer-based analysis in support of materials policymaking. Finally, despite the clear benefits to private as well as public sector materials decisionmaking, some will distrust or perhaps even resent an increased role-even if only informational—for the Federal Government and bureaucracy in the materials area.

3. Impacts Judged To Be Detrimental

Important potential detrimental impacts, manifested most significantly at the maximum level of improvement and change (a new Administration or Commission) include:

- Potential, which with appropriate safeguards is probably controllable, for accidental disclosure or deliberate misuse or abuse of sensitive information, thus damaging the competitive position of some firms;
- Disbenefit to those who have profited (economically or politically) by control over limited information or to agencies whose constituency, funding, or mandate may suffer disturbance by creation of a new office or agency; and
- Increased direct dollar costs of materials information systems integration or improvement.

The first detrimental impact—the potential for harmful and unwarranted disclosure of private information—apparently could be avoided at the intermediate level of improvement and change, and at least moderated or controlled at the maximum change level. Most of the data supplied by individual companies would be legitimately considered confidential under the Freedom of Information Act, and additional protection from harmful public disclosure of sensitive corporate information is found in many other existing statutes and regulations, At the maximum change level (a new Administration or Commission), there is greater potential for data security problems associated with extensive use of computer data bases and interconnections. Thus additional legal, technical, and administrative safeguards may be needed.

The second impact—a disbenefit to those who profit by control over limited information or to other agencies whose constituency, funding, or mandate may be disturbed—is a potential public benefit or is neutralized in the long run. Disbenefits to particular groups or agencies must be weighed against the public benefits of an improved informational basis for public policymaking and better integration and organization of existing Federal Government materials information systems, among the other beneficial impacts discussed earlier

4. Conclusions Regarding Possible Impacts

The impact analysis suggests the following conclusions:

- The potential impacts of improvement in organization and integration of materials information systems in the Federal Government appear to be primarily beneficial. Moreover, the likely detrimental impacts in large measure are avoidable (through use of appropriate safeguards), controllable (within tolerable limits), or justifiable in the public interest.
- At the incremental level of improvement and change (establishment of a Materials Information Referral Office and improvement of existing data bases and systems through actions of a Materials Information Coordinating Board), all impacts could be minimal or marginal. Benefits do

not appear to be of major or overriding significance, and costs appear to be negligible.

At the intermediate level of improvement and change (establishment of an Office or Bureau of Materials Statistics and Forecasting, or the equivalent), many impacts could become significant. At this level and above, some of the potential impacts appear to be critical or of overriding importance relative to other trends in society, the Government, and the economy. And even those impacts which in the short-run are marginal or minimal may assume cumulative importance over time. Overall, potential benefits of a Bureau of Materials Statistics and Forecasting (or the equivalent) are judged to substantially outweigh any potential detrimental impacts,

- At the maximum level of improvement and change (elevation of the materials information office or bureau to agency status in the form of an Administration or Commission), several impacts could be very beneficial, However, at this level the possible detrimental impacts or costs could be significant enough to warrant very careful consideration of the trade-offs involved,