



**Strategies for Urban Research and Development: A Summary Report of the Recommendations of the Committee on Social and Behavioral Urban Research and the Committee on Urban Technology (1968)**

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STRATEGIES  
for  
URBAN RESEARCH AND DEVELOPMENT

A Summary Report of the Recommendations  
of the  
Committee on Social and Behavioral Urban Research  
and the  
Committee on Urban Technology

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## PREFACE

This coordinated report of recommendations on strategies for urban research and development responds to a request from the Department of Housing and Urban Development for advice. It is a summation of the recommendations developed independently by the Committee on Social and Behavioral Urban Research and the Committee on Urban Technology since the organizing meeting of those committees on December 12, 1967. More complete recommendations, together with discussions upon which they are based, are to be found in the separate reports of the two committees, A Strategic Approach to Urban Research and Development, Social and Behavioral Science Considerations and Long-Range Planning for Urban Research and Development, Technological Considerations. The reports of the two committees are commended to the attention of the serious reader.

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Chairman, Committee on Social  
and Behavioral Urban Research

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## INTRODUCTION

The Committee on Social and Behavioral Urban Research and the Committee on Urban Technology were formed in the fall of 1967 as two parallel efforts within the Division of Behavioral Sciences and the Division of Engineering, respectively, of the National Research Council, in response to a request for advice from the Department of Housing and Urban Development "...on certain important elements of its long-range research and development program which is addressed to improving the Department's capability to deal with current and emerging needs of the Nation's cities and towns." The Committee on Social and Behavioral Urban Research was requested to give particular emphasis to "...those social, economic, and institutional factors which affect the selection, introduction, and use of new techniques and programs..." and the Committee on Urban Technology was requested to place particular emphasis "...on developing new technologies and improved cost-reducing approaches by industry to meet social needs." Within the contexts of these differences in emphasis, the two committees organized their activities in terms of a common statement of work outlined in the contract between the Academy and the Department of Housing and Urban Development.

The committees were differently composed, of course, with different primary emphases and different skills. The membership of the Committee on Social and Behavioral Urban Research was drawn predominantly from the social sciences and largely from universities, while the Committee on Urban Technology was composed primarily of engineers drawn from industry and universities. The two committees, however, shared a commitment to the view that the resolution of current and future urban problems is fundamental to the life of the nation and that the research and development contribution to successful management of these problems will place an enormous demand on the engineering, technical, and scientific resources of the nation.

The initial meeting of the two committees was in part a joint session during which the committees were briefed by representatives from the Department of Housing and Urban Development on the current status of the Department's research and development program. Prior to the transmittal of the committees' interim reports to the Department, an executive group, composed of the chairmen and two members each from the committees, met and reviewed the activities of the two committees and agreed upon a common outline for interim reports of the committees. Except for the initial and executive committee meetings and periodic briefings by staff on the accomplishments and directions of the parallel effort, the two committees worked separately and independently. Agreement in the recommendations of

the two committees is particularly significant by virtue of the fact that they are arrived at independently. In view of the independence of the separate committees, it may be assumed that a high degree of priority should be given to those recommendations upon which the committees agree. The emphasis in this summary coordinated report, therefore, is on those recommendations.

In addition to agreement between the two committees on several recommendations, they also reached somewhat different but nonetheless complementary conclusions with respect to some matters as a consequence of having taken different approaches to them. In these instances, differences should be viewed as mutually additive or reinforcing. It should be added that there are no fundamental differences in the advice given by the two committees to the Department of Housing and Urban Development except perhaps as these may arise from the underlying conceptual frameworks that served to guide the committees' work.

Finally, in respect to the summary report of the separate recommendations of the two committees which follows, it should be pointed out that the fact that certain particular recommendations appear among those of one but not both of the committees' reports does not mean that they are of any less importance to the Department of Housing and Urban Development. Given the independence of the committees' efforts and the diversity of perspective and areas of competence represented in their memberships, it would be surprising, indeed, if all recommendations emerged simultaneously from the efforts of both committees. The recommendations of the two committees and the reasoning and findings upon which they are based are reported in detail, of course, in the separate reports of the two groups.



## STRATEGIES FOR PLANNING RESEARCH

Both committees stress a strategic approach to research and development that confirms the fact that hardware and software must be considered and planned for together, and that they are not mutually exclusive investment alternatives. Both committees argue for the advantages of a multidisciplinary approach to urban problems, and concur in the recommendation that first priority in developing the Department's research and development program should be given to mobilizing and creating new social and behavioral science research and application capabilities. The committees agree further that the buildup of software requirements should complement rather than substitute for investments in technological research and development. The Committee on Urban Technology finds that:

Both physical technology and social technology must be brought together in evaluating and implementing solutions to urban problems....Accordingly, the development of the "social engineer" through the efforts of the universities, municipal governments, and the Department of Housing and Urban Development should have the highest priority. This type of capability is essential to define the needs and thus provide the performance objectives to be satisfied by evaluation of the wealth of available physical technology.

From a different perspective, the Committee on Social and Behavioral Urban Research arrived at the same conclusion:

This country, as well as other societies, is still being penalized because the human dimensions of the urban process are so poorly understood. In the absence of a purposeful and concerted effort to remedy this situation and to anticipate both the future problems and opportunities that urban America may face, it will continue to be penalized. For such an effort, the social and behavioral sciences are both relevant and useful, if not critical. They make possible the shift from an emphasis upon "bricks and mortar" questions in urban research and development to a systematic emphasis upon questions which, when answers are forthcoming, will illuminate processes of social change, provide information about human consequences of urban problems, and point to new options for social action.

In setting forth additional priorities in a strategic approach to urban research and development, both committees give heavy weight to the need for program-evaluation research. This conclusion was approached by the committees in different ways that should be made explicit. The Committee on Urban Technology, in giving primary emphasis to assessing the value of implementing available technology, viewed each implementation as an operational experiment designed expressly for the purpose of observation and analysis as to its contribution to urban improvement. The realization of the physical design and cost estimates of these experiments should in each instance be evaluated. Project evaluation in this sense is a short-term effort. However, the evaluation of the social and behavioral consequences of both technological and social projects and programs is agreed by the committees to be a continuous and long-term activity. The Committee on Social and Behavioral Urban Research assumes that policies and programs must be under constant scrutiny if they are to achieve their intended results and therefore recommends that program-evaluation research be given high priority in the allocation of the Department's research and development resources.

Another element in choosing among priorities in a strategic approach to urban research and development, of course, is the allocation of resources between short-term and long-range projects. The two committees agree on the value and necessity of relatively short-term investments, but they also agree that a significant proportion of research and development funds should be invested in research and development activities that might be expected to yield contributions in a long-term period. The Committee on Urban Technology recommends that 50 to 60 percent of the Department's research and development resources should be put into projects for early implementation and 30 to 40 percent should be allocated for long-range projects. The Committee on Social and Behavioral Urban Research agrees on the merit of short-term research and development projects, particularly as they relate to the implementation of new technology. The committees agree that proof on a limited scale is an essential step before widespread applications are undertaken in a large number of cities or unduly large sums committed to short-term projects. If scientific and technological knowledge and inquiry are to serve the society well, they must be used in part to inhibit action on attractive but misconceived courses, as well as to create new options for action.

Both committees concluded that, while the buildup of research and development capabilities should receive first-order priority, the guiding principle for setting priorities

should be that the development of capabilities, manpower and funding be kept carefully in phase. Thus, allocations of money should neither exceed nor fall short of qualified manpower and its capabilities for implementing the projects to which the money is allocated. On the other hand, sufficient funds should be allocated to support the manpower and capabilities assigned. An important preliminary to the achievement of the proper balance is an accurate survey of the qualified manpower that is available.

Both committees recommend that a coordinated development of available and potential resources should proceed at a level of magnitude that would double the Department's research and development effort each year for three to five years as an initial step. Beyond this, the Committee on Urban Technology recommends a contingency plan of accelerated activities to be undertaken coincident with the conclusion of United States participation in the Vietnam war. This plan would depend upon the capability that has been achieved at the time the accelerated allocation of resources would be made available, and could involve enhancement of research, of development, or of application efforts. The Committee on Urban Technology is in agreement with the Committee on Social and Behavioral Urban Research on the point that whatever funds are available, research and development priorities determined primarily by a sense of urgency to show results must be complemented by the need to develop programs and resources that will contribute to improving the quality of urban life over the years to come.

In the citation and discussion of essential recommendations that follows, an attempt is made to correlate in summary form the recommendations of the two committees so as to illuminate the essential perspectives and significance of the full reports of the committees.

In considering the basic strategy for developing the Department's research and development program, the Committee on Urban Technology concludes that

while there are significant research opportunities for development of new technology that will contribute to urban improvement, the primary opportunity resides in the effective application of available technology to the most urgent urban development problems; and that particular emphasis must be given to efforts by the applied social scientists that will define these needs and requirements and thus guide the technological efforts.

Examples of possible applications of available technology are improvements in factory-produced low-cost housing; the use of sophisticated systems for the provision of such utilities as water, energy, communication, chilled water for air conditioning, and waste disposal; and more efficient planning for land use.

With respect to the basic approach to be adopted in formulating research and development policies and programs, the Committee on Social and Behavioral Urban Research recommends that the Department of Housing and Urban Development

establish research and development program priorities in a manner consistent with keeping extramural research and development expenditures in phase with the mobilization of existing and potential research and development capabilities, the development of manpower, and the creation of new capabilities; begin immediately on the tasks of strengthening present and creating new research and development capabilities in the social and behavioral sciences;

This is, to begin with, a matter of determining the best resources for various tasks; that is, university, industry, nonprofit, municipal government, inhouse. The effectiveness of the "extramural network" will depend on inhouse insights and capabilities, permitting the most efficient use of the resources of the "network" in planning, programming, and execution of research and other tasks.

allocate its research and development budget so that (a) a substantial share is earmarked for the orderly development of the network of extramural research and development capabilities, including the corresponding supplies of scientific and professional manpower requirements, (b) a significant portion is devoted to program-evaluation activities, and (c) adequate provision is made to support short-run research centering on the implications for policy intentions of the results of efforts to measure the effects of the urban programs.

## RESEARCH AND DEVELOPMENT CAPABILITIES

Research and development activities must be related to the manpower and institutional resources available for conducting them. This requires that a program for investment in research and development be accompanied by programs designed to (1) assure access to and effective use of available research and development capabilities; (2) enhance existing manpower and institutional resources; and (3) help bring into being and assist in the growth of new research and development institutions as required. In the absence of planned efforts along these lines, there is no assurance that investments in research and development will produce results useful for the entire range of decision making involved in planning, implementing, evaluating, and reformulating or modifying policies and programs.

The two committees agree that the Department's present policy of having most of its research and development conducted extramurally through contracts and grants is sound. The network of related extramural research and development capabilities needed by the Department of Housing and Urban Development can be constructed in part by mobilizing existing research capabilities, so as to bring them more effectively to bear on issues of social policy. In addition to utilizing available research capabilities, the committees agree that the Department must also create new institutional capabilities to achieve those mission-oriented research objectives for which existing resources are likely to be unresponsive or unsuitable. Further, both committees stress the critical importance of the Department's inhouse research and development capability for the establishment of goals, program planning, project management, and evaluation. These specific recommendations of the two committees for developing a coherent network of relevant research and development activities are aimed at meeting the Department's research and development needs by university, industrial, nonprofit, municipal government, inhouse, and other capabilities.

With respect to mobilizing existing university research and development capabilities, the Committee on Social and Behavioral Urban Research recommends that the Department of Housing and Urban Development

support basic research in the behavioral and social sciences, as well as in the natural sciences, to contribute to the growth of knowledge and its application to the problems of the city;  
support, on a continuing basis, a small number of university urban institutes or centers selected on



the basis of staff competence and diversity of interest and location, and expand the number of such institutes or centers as funds become available; support unsolicited as well as solicited proposals that meet the criteria of merit and quality by grant and contract; and support university educational training programs related to urban needs by providing funds for curriculum revision, facilities, and pre-doctoral and post-doctoral fellowships.

To encourage universities to strengthen and redirect their capabilities and to apply their talents to the requirements for training, research, and community participation in urban affairs, the Committee on Urban Technology recommends to the Department of Housing and Urban Development that

an inventory should be taken of the capabilities that now exist or that might be developed in the universities. The inventory would identify universities with potentials for coordinated interdisciplinary urban programs with inputs from architecture, city planning, education, engineering, law, public administration, and the social and behavioral sciences. This should then be compared with a projection of requirements for professional manpower to determine a basis for further fellowship support; universities should be encouraged to join their efforts with local governments and industry to develop viable programs of education seeking to improve the capability of those involved in urban management.

One of the quickest ways to fill the gap between the need and the supply of professional manpower is to embark on a program of mid-career updating of selected persons who have a potential for carrying greater responsibility and who are now employed in urban management. This might take the form of a three-month study of modern urban science and technology (MUST) with lecturers from universities, government, urban institutes, and industry. The course should not attempt to make each manager an expert in a narrow discipline, but rather to orient each toward an increased understanding of relationships, interfaces, and the application of modern tools for managing urban affairs.

With respect to utilization of existing nonacademic private research and development capabilities, the Committee on Social and Behavioral Urban Research recommends that the Department of Housing and Urban Development

survey systematically existing private profit and nonprofit research and development organizations, consulting firms, and industrial organizations to assess their resources for undertaking urban-related research and development, and set standards of expected performance.

In order to take advantage of the talent and managerial experience of industry, the Committee on Urban Technology recommends to the Department of Housing and Urban Development that

seminars and continuing dialogue with representative industrial leaders be conducted to assess the needs of industry in specific inner-city situations to reduce investment risks and encourage participation in community-improvement efforts.

In general, two main factors will govern industrial participation: (1) the risk and (2) the market; that is, the potential volume of activity. One way of overcoming the risk factor is to have private enterprise act as a management contractor and/or agent for a government agency. Such an arrangement enables private industry to contribute its managerial experience and technical capability with minimum risk to the stockholder.

In order to create coherent applied research and development capabilities, the Committee on Social and Behavioral Urban Research recommends that the Department of Housing and Urban Development

undertake the planning activities required to bring about six additional urban institutes into being, including exploration of opportunities to create such institutes by modifying or expanding research centers now associated with other federal agencies, private organizations, or universities.

The Committee believes that the urban institutes should have a continuing functional relationship with the Department of Housing and Urban Development but that the institutes themselves should work out strategies for research and define responsibilities for detailed operations. The Department and the institutes should work out effective balances of problem-solving and training functions, as particular areas and programs require.

With respect to the use of the urban institute as a research and development resource, the Committee on Urban Technology observes that

the newly created Urban Institute could be a source of creative contributions, it could test hypotheses, it could evaluate alternatives, and it could compare evaluations made by other groups.

The Department's funding should emphasize this kind of contribution to the Departmental mission. The Department's dependence on the Institute will require some continuity of funding at a level sufficient to maintain a healthy, productive, and efficient work force in the Institute devoted to the Department's requirements. This is often referred to as a staff of "critical size."

To create research and development capabilities in state and local governments, the Committee on Social and Behavioral Urban Research recommends that the Department of Housing and Urban Development

experiment with the form, location, and funding of Municipal Development Centers to discover the most effective means for strengthening research capabilities in municipal governments; and examine the means by which urban R & D capabilities can be provided for state governments; and secure authorization for programs designed to expand the supplies of scientific, professional, and related manpower for service with local governments in connection with urban affairs.

The experiment with establishment of MDC's should be conducted so as to be consistent with the development of external research and development capabilities; that is, to achieve as wide a variety of forms, competencies, and "end-products" as possible from the investment of scarce resources.

increase the number of MDC's each successive year over the next three years to about 25 so as to provide an experimental base for determining whether the MDC's should be made operational on a national scale;

The principal aim of the MDC program is to link research and development capability to competent municipal administration. The Committee on Social and Behavioral Urban Research recommends that the Department of Housing and Urban Development, while constantly reviewing its original six pilot efforts, increase the number of MDC's each year over the next three years to provide an experimental base sufficient to determine whether they should be made operational on a national scale. An experimental



base of between 20 and 30 centers would be sufficient to provide the information and experience required for such a decision.

evaluate the MDC experiment as an attempt to (a) provide for mutually profitable relations between researchers and local decision-makers; (b) attract professional manpower into local government; (c) produce new and needed skills; and (d) contribute to the information requirements for sound policy judgment at all levels of government; exercise sufficient control over the MDC's to assure a reasonable body of comparable data for use by local, state, and national research bodies.

In order to broaden the viewpoint and upgrade the professional competence in state and city operating organizations, the Committee on Urban Technology recommends to the Department of Housing and Urban Development that

consideration should be given to the possibility of collaborating with existing organizations concerned with developing a professional city management.

Opportunities to work with academic institutions and industry should be welcomed by city administrators. One way of relating to university capability might be to create openings for young faculty members or graduate students to spend a year or more as city employees, with freedom to maintain close and formal relations with the urban research facilities of their home institutions. Such a cooperative urban fellowship program could become a means for recruiting and developing applied social scientists.

With respect to developing the Department's intramural research and development capabilities, the Committee on Social and Behavioral Urban Research recommends that the Department of Housing and Urban Development

increase its intramural multidisciplinary research and development staff to between 75 and 100 professionals over the next five years and draw personnel from outside as well as from within the social and behavioral sciences; offer salaries and working conditions that will attract able and experienced personnel from the academic and industrial worlds, making provision for a large proportion of higher grades and disproportionate number of "super grades."

It should be anticipated that the Department of Housing and Urban Development will encourage and facilitate the mobility of research specialists among the urban institutes, municipal development centers, universities, industry, and the Department's inhouse staff. Fellowship programs should attract university researchers for short periods of service with the Department. The committees join in recommending that the Department of Housing and Urban Development

complement its inhouse capabilities with independent advisory mechanisms on research and development policies and programs.

The Department will want to continue to use consultants on technical problems and policy issues to complement its own staff resources. Whether the Department's most sanguine budget hopes are realized or frustrated, it will be in better position to set priorities and allocate resources for research and development if it can secure informed and tough-minded advice from external sources on both an ad hoc and a continuing basis.

In order to enhance the research and development staff capabilities within the Department, the Committee on Urban Technology recommends to the Department of Housing and Urban Development that

the magnitude and importance of the urban problems warrant applying substantially more of the Department's staff to its urban research and development mission, suggesting an annual doubling of the research and development effort each year for at least three years;  
the Department should develop a staff project management structure for monitoring, guidance, and correlation of projects developed within the Department but carried out elsewhere under contract.

Such a structure is necessary as long as the Department does not possess an inhouse research capability. Many projects should be carried out by private research agencies and the private entrepreneurial community with experience in practical matters of urban development. Some will be appropriate for urban institutes and in universities, however, and invitations to respond to such proposals should continue to go to those institutions that have specific capabilities in the relevant areas of technology and applied science and that have unique opportunity to work with local governments.

make provisions for the discretionary use of some portion of contracted funds, develop mechanisms to process unsolicited proposals, and support state and local research and development programs through contract.

## POLICY ANALYSIS AND PROGRAM EVALUATION

The two committees agree on the importance of goal analysis and program evaluation for making research and development efforts relevant for the formulation of Departmental policies and programs. With respect to research and development contributions to policy analysis and program evaluation, the Committee on Social and Behavioral Urban Research recommends that the Department of Housing and Urban Development

devote a major and continuing inhouse effort to the translation of statutory statements of goals into operational terms, so that the relationships assumed to lie between goals and the instrumentalities for realizing them are made explicit and amenable to research; and  
conduct evaluation research designed to assess both the intended and the unanticipated effects of programs on a continuing basis, so that the results will contribute fully to the reformulation and modification of policies and programs; and  
continue to have the Director of the Office of Urban Technology and Research report directly to the highest levels within the Department.

The Committee on Urban Technology believes that the establishment of goals for the Departmental mission is of the greatest immediate importance and that the application of technology to the spectrum of community problems should be continuously evaluated, and therefore concludes that

a structure for the continuous evaluation of the results of urban technology programs be developed; approximately 5 to 10 per cent of the program funds should be devoted to evaluation. More may be needed to guide and support program planning.

The development of criteria for evaluation and the scheduling of periodic evaluations should be required elements in all project work statements. Such an approach should: assure maximum learning from each project; identify technology, plans, and programs that deserve dissemination; avoid repetition of less fruitful paths; guide formulation of new projects; and provide experience information to assist in the selection among both solicited and unsolicited project proposals.



## RESEARCH AND DEVELOPMENT PROGRAMS

Contemporary attitudes toward and techniques for effecting intended social change make the role of information increasingly important in both planning and implementing action decisions. A powerful tool in the national effort for urban reform and reconstruction would be the capacity for the systematic collection, storage, processing, and selective dissemination of data relevant to urban needs and the functioning of urban programs. The two committees agree that the Department of Housing and Urban Development is in a position to assume the key role in the development of information requirements, resources, and systems, and thus to contribute to the creation of operationally effective urban information systems.

With respect to research and development related to developing urban information systems, the Committee on Social and Behavioral Urban Research recommends that the Department of Housing and Urban Development

organize its data, information and measurement activities under an Office of Information Management; associate itself with several major attempts to develop, test and evaluate specific information systems; but refrain from investing sizable resources in the development of large-scale urban information systems until there is a better understanding of how they can best be introduced and constructed; and devote a special effort to systematic investigation of the kinds of urban intelligence systems that would complement the growth of urban information systems.

The Department is in a position to assume the key role in the development of urban information systems, and thus contribute to the creation of a national urban information system. Its activities in the information field, therefore, should, to the extent now possible, be based on an overall model of what a complete information system to meet national urban needs would be like.

The Committee on Urban Technology confirmed the recommendations of the Committee on Social and Behavioral Urban Research in its report.

With respect to planning activities and urban information needs, the Committee on Social and Behavioral Urban Research recommends that the Department of Housing and Urban Development

provide immediate support for research that will meet two kinds of information requirements: (a) demographic studies for which the significant variables and the methods for data gathering and analysis are immediately available and the results of which are known to be relevant, and (b) studies of the conditions of variations in neighborhood cohesion for which the variables and significant measures have yet to be developed but can be stipulated to have major significance and long-run relevance.

With respect to urban research and development planning and urban information needs, the Committee on Urban Technology recommends to the Department of Housing and Urban Development that

the immediate planning efforts of the Department should include program planning among its major objectives. This will require: (a) examination of historical trends, (b) establishment of an information system, (c) research and analysis of the urban environment for opportunities and constraints, and (d) synthesis and evaluation of alternative courses of action.

The magnitude and expanding nature of these tasks warrant a substantial increase in the Department's capabilities as competent personnel become available. In addition to personnel with a high level of competence in the sociological area, the Department will require persons who are competent in the development and operation of a logical systems analysis structure and persons who are knowledgeable in both the availability and the application of technology in synthesizing feasible alternative solutions to urban problems as well as evaluating the worth of alternative solutions.

the Department should assume the leadership in establishing a mechanism to correlate the mission responsibilities of all the federal agencies concerned with various aspects of urban research and development planning. In addition to representation from the federal agencies, there should be representation of the viewpoints of industry, universities, and special institutions.

With respect to the promise of "the systems approach" for coping with urban problems or for designing research and development programs, the Committee on Social and Behavioral Urban Research recommends that the Department of Housing and Urban Development

support multidisciplinary research to identify the systems parameters and interaction properties of urban units, investing only modestly in the immediate future in computer-aided simulations of the urban environment;

and the Committee on Urban Technology recommends that

the task of urban development cannot be undertaken without consideration of and planning for the interrelationship of the whole community, including both the suburbs and the urban areas.

With regard to specific substantive research and development topics that should be supported by the Department of Housing and Urban Development, the differences in the recommendations of the two committees reflect differences in their areas of competence but the results of these independent efforts are not in opposition. Indeed, the committees wish to reemphasize the virtue and necessity of viewing technological and social and behavioral science research and development requirements as inseparable in a strategic approach to improving the quality of urban life.

With respect to overcoming obstacles to implementing present policies and finding new program instruments, the Committee on Social and Behavioral Urban Research recommends that the Department of Housing and Urban Development support specific research projects in the following areas:

local governance, as, for example, (a) studies of the ways different types of governments function in different social environments, and (b) the advisability of transferring functions from one to another form of government;

fiscal policies and the provision of public services at the local level, as, for example, (a) studies of the impact of the property tax on location decisions, land use, and housing maintenance, and (b) the costs and benefits of new types of user charges;



the effects of legal controls, as, for example, (a) the nature and outcomes of the bargaining process between city developers and regulating agencies, and (b) the potential benefits of new legal definitions of ownership; and the social and institutional setting of housing programs, as, for example, (a) alternative measures of housing quality, and (b) functional criteria for density controls.

With respect to the successful implementation of available technology and to provide a base for further technological program development as social requirements are identified, the Committee on Urban Technology recommends to the Department of Housing and Urban Development that

a series of carefully chosen large-scale experiments should be undertaken to explore the significant applications and implications of balanced systems for community development; the Department is urged to take the leadership in continued exploration of opportunities for further developments in industrialized housing production;  
the potential opportunities of the community service center concept for the organization and distribution of discretionary services should be studied and evaluated. An early stage of the research should explore appropriate lay-outs and combinations of facilities;  
the feasibility and usefulness of sophisticated systems for nondiscretionary services should be evaluated in full-scale field experiments in several communities and in several variations. Such experiments should work to evaluate the desirability and economics of combined service tunnels for utilities, such as water, energy, communication, chilled water for air conditioning, and waste disposal;  
consideration of improvement of rail-guided and independently controlled vehicles for use in urban areas and of short-haul aircraft technology should be a part of urban transportation planning; in Departmental programs associated with the planning of expensive long-lived public facilities systems, allowance should be made for further application of forecasted technology to avoid obsolescence;



efforts should be made to encourage further development needed for adapting the performance criteria concept as a possible alternative to design specification type building code; and research for low-cost housing should seek means to reduce all cost elements, especially those outside of construction, and should consider the mixed utilization of new construction, refurbishing, upgrading and relocation.



## CONCLUDING STATEMENT

We have sought to bring together here in some useful, coherent form a summary of the principal findings and recommendations of the Committee on Urban Technology and the Committee on Social and Behavioral Urban Research. These are delineated in considerable detail, of course, in the full reports of the two committees. The committee staffs, and the executive staff of the National Research Council stand ready to assist the Department of Housing and Urban Development in further discussion of the ideas and proposals set forth here.

