Urban Research Initiative

The Dynamics of Change in Urban Environments

Program Solicitation

Proposal Deadline: July 17, 1998

NATIONAL SCIENCE FOUNDATION

URBAN RESEARCH INITIATIVE:

THE DYNAMICS OF CHANGE IN URBAN ENVIRONMENTS

INITIATIVE SOLICITATION FOR FY 1998

NATIONAL SCIENCE FOUNDATION

INTRODUCTION

The National Science Foundation (NSF) has established themes for focused research. These themes represent exciting opportunities in research and education with potential for immense benefits to society: Knowledge and Distributed Intelligence (KDI), Educating for the Future (EFF), and Life and Earth's Environment (LEE). LEE encompasses a wide range of activities designed to foster research on the complex interdependencies among living organisms and their environments that affect, sustain, and are modified by them. This includes research in the areas of Life in Extreme Environments, Global Change, and Urban Communities.

The Urban Communities emphasis will be a multiyear activity encompassing a series of research opportunities designed to examine the functional interrelations among physical, biological, social and engineered systems and processes. In addition to gathering data essential to understanding these interrelations, research will attempt to identify the set of complex factors that enable vigorous, healthy urban communities. This solicitation, "Urban Research Initiative for FY 1998: Dynamics of Change in Urban Environments" is the first research opportunity in the Urban Communities emphasis.

Fundamental questions concerning the urban environment and its functions require interdisciplinary research into holistic interactions among the built, human and natural environments. Analysis of urban environments is growing increasingly complex with expansion in urban and suburban areas, greater expectations for infrastructure service and delivery, and increasing diversity of cultures and environments.

The urban environment can be characterized as the place where built, human and natural environments co-exist and interact, as conceptualized by the Venn diagram in Fig. 1. Research in URI must fit into a context that addresses issues at the intersections of these environments, indicated by any of the numbered areas in the diagram. As the pace of change for urban processes accelerates, urban policy must be based on an enhanced understanding of the complex interactions that develop and change the urban environment.
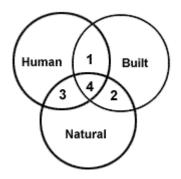
Figure 1. The Urban Environment

Examples of research in each Venn diagram intersection area:

Area 1 Human/Built: e.g., equity, accessibility, valuation, life cycle issues, impact of housing, transportation, and information infrastructure on urban communities.

Area 2 Built/Natural: e.g., urban ecology, environmental technology, deterioration, tradeoffs.

Area 3 Natural/Human: e.g., diversity, access to nature, resource management and development.

Area 4 Human/Built/Natural: e.g., optimization, systems analysis, full scale valuation, decision sciences, political science, disaster and hazard prediction, response and mitigation, education to strengthen informed citizenry.

GENERAL DESCRIPTION OF THE URI PROGRAM

The goal of the Urban Research Initiative (URI) is to support interdisciplinary research, conducted to achieve broad understanding of urban environments, and the processes that determine or constrain the nature and direction of change in urban environments. The complexity of these environments challenges our understanding because current theory and research tools are too crude and discipline- bound to permit holistic assessment. Thus, it is increasingly important for scholars to integrate studies from different disciplines, to address how to characterize the built, human, and natural urban environments, and to develop models for the processes and interactions that shape the urban environment.

For example, many communities are facing reinvestments in large-scale infrastructure, but have no method of broadly evaluating the current system effectiveness or the impact of changes on the natural and social infrastructure of urban environments. Resource management is becoming more important in dense urban areas, as many communities face shortages and degradation of the resources upon which they depend. People living and working in urban environments have new personal expectations, and require new approaches to education. Furthermore, issues of equity are becoming increasingly important. Finally, increasing urban density is affecting human ability to respond to, and prepare for crisis/hazard conditions.

Recent technological advances and contributions to the basic understanding of the psychological, social, educational, and cultural capacities of urban environments present opportunities to address urban research in new ways. Advances in information technology have improved our ability to acquire, analyze, and disseminate data from an expanding array of disciplines; educational interventions and investments make it possible to translate research and theory into the teaching and learning contexts of urban classrooms, and to evaluate factors which contribute to strong educational systems; partnerships within education systems are now prominent and present models for reforming extant education environments; and, new scientific methods and techniques are available for developing better models of our complex urban environments. Concentrated urban activities induce climate change, increase hydrologic risks, and introduce potential pollution problems.

URI RESEARCH

A broad agenda for urban research was developed at a July, 1997, National Science Foundation workshop involving 28 leading scientists from various urban and related research environments. Investigators are encouraged to refer to the final report of the workshop held in July, 1997, as they develop proposals for this competition. The report can be accessed on the NSF homepage at <http://www.sbe.nsf.gov>.

Research supported within URI is expected to facilitate the development of a predictive understanding of the complex interactions of people, the natural environment, and the physical settings of urban environments. The urban areas of interest are large cities and associated suburban developments, the business and industry that takes place within

them, and the built and human systems which link their populations.

The research framework for this effort can be framed in terms of:

- different settings and density of development, e.g., central business districts, residential areas, brownfields, industrial areas.
- different population groups, e.g., racial, ethnic, socio-economic composition at different scales, e.g., neighborhood, city, and regional.
- different attributes and history of development of local settings, thus addressing the transferability of learning between urban areas.
- different rates of change, e.g., gradual trends, sudden natural hazards (e.g. floods, earthquakes, storms, volcanoes), extreme social stress.
- different strategies for establishing integrated formal and informal education, including institutional partnering.

The URI program is established to strengthen basic understanding of the principal processes that drive the dynamics of urban environments and contribute to expanding the knowledge bases decision-makers use to create viable urban environments. The study of complex urban environments requires development of innovative models, methods of data aggregation, indicators of change and viability, and interdisciplinary performance measures.

DYNAMICS OF CHANGE IN URBAN ENVIRONMENTS

For FY 1998, the URI research opportunity is focused on the area of dynamics of change in urban environments. Research proposed in response to this solicitation should be interdisciplinary, and should take advantage of education reform and advances in engineering, science and information technology. The research should be focused on the development of integrated models to represent the processes and impacts, and to understand process interactions.

Researchers may choose to address an urban issue(s) using a geographic approach of space; by time, using longitudinal data and/or rates of change; or by characterization of diversity, capturing social/cultural/natural/ service characteristics.

Researchers may alternatively choose to develop different and holistic strategies for establishing integrated formal and informal education, including institutional partnering.

This solicitation is only for research proposed in areas 1, 2, 3, and 4 as identified in the Venn diagram introduced in Fig. 1. Before preparing a proposal for this research activity, investigators are strongly encouraged to contact the relevant Urban Research Working Group representatives listed at the end of this solicitation. Research outside of the Venn diagram intersections, and therefore work more likely to be single-discipline in nature, can be submitted to appropriate existing programs at NSF.

NSF expects that U.S. academic institutions will submit proposals to this competition as the lead institution. Researchers are encouraged to develop partnerships with relevant stakeholders (e.g., community groups, NSF funded centers & institutes, other government agencies). Proposals that will contribute to our understanding of, and be transferable to international/global communities are also encouraged. **Research proposals dealing with public health issues or targeting problems associated with, and limited to, a site-specific urban environment are NOT appropriate for this competition.**

Award durations of two to three years will be considered, and average award levels are anticipated to be $300,000 to $500,000. **In response to this solicitation, NSF expects to make approximately 10 to 20 awards totaling $6 million.**

WHO MAY SUBMIT

NSF expects that U.S. academic institutions will submit proposals to this competition as the lead institution. Proposals submitted on behalf of individuals or groups in response to this solicitation will be accepted from colleges, universities, and other nonprofit research institutions in the United States. Multi-institutional arrangements and partnerships are permitted and encouraged.

INSTRUCTIONS FOR PROPOSAL SUBMISSION

Proposals submitted in response to this Solicitation must be prepared in accordance with the instructions provided in the NSF Grant Proposal Guide (GPG), NSF 98-2, and Proposal Forms Kit NSF 98-3.

These guides are available in most university Sponsored Research Offices (SRO's). Single copies of the GPG brochure and other NSF publications referenced in this solicitation are available at no cost from:

> NSF Publication Clearinghouse
> P. O. Box 218
> Jessup, MD 20794-0218
> Telephone: 301-947-2722
> e-mail: pubs@nsf.gov

The NSF publications may also be accessed through "Search" on the NSF web page at: <http://www.nsf.gov>.

Proposals must reference this program solicitation (NSF 98-98) on the cover page. Page limitation guidelines will be strictly adhered to. **No appendices to the proposal are permitted, and proposals submitted with appendices will be returned without review.**

Proposals prepared for this solicitation may be submitted as paper copies or by electronic submission. For paper submission, 15 (fifteen) stapled copies of each proposal, including one bearing original signatures from the institution(s) should be mailed to:

> Solicitation No. NSF 98-98
> National Science Foundation
> Room P60-PPU
> 4201 Wilson Boulevard
> Arlington, VA 22230

Proposals are encouraged to be submitted electronically using the NSF FastLane system for electronic proposal submission and review, available through the World Wide Web at the FastLane home page (<http://www.fastlane.nsf.gov>). For information, contact FastLane user support services (tel: 703-306-1142; <fastlane@nsf.gov>). In the future, FastLane submission will be required for URI research opportunities.

To access the FastLane Proposal Preparation application, your institution needs to be a registered FastLane institution. A list of registered institutions and the FastLane registration form are located on the FastLane home page. For questions concerning FastLane, please send an e-mail message to <fastlane@nsf.gov>.

Proposals must be received at NSF no later than 5:00 PM EST on July 17, 1998. For those submitted by FastLane, the signed cover page must arrive at NSF by 5:00 p.m. EDT on July 17, 1998.

PROPOSAL REVIEW

Proposals will be evaluated in accordance with the new NSF merit review criteria (see Appendix 1). Proposal review will be coordinated by a working group of NSF program officers and representatives from the participating directorates. The selection process will involve a panel review to determine intrinsic merit and broad impact. Additional ad-hoc mail reviews may be used as well.

GRANT ADMINISTRATION

The final award recommendations will be a joint decision of the working group. Grants will be administered by one of the relevant Foundation directorates as determined by the working group in accordance with the individual policies of the awarding directorate.

NSF grants will be administered in accordance with the terms and conditions of NSF GC-1, "Grant General Conditions," or FDP-III, "Federal Demonstration Partnership General Terms and Conditions," depending on the grantee organization. More comprehensive information on the administration of NSF grants is contained in the Grant Policy Manual (NSF 95-26).

Grantees will be required to submit an annual report. In FY 1999, a new electronic project reporting system, through the NSF FastLane system, will permit updating of reports on project participants (individual and organizational), activities and findings, publications, other specific products and contributions. Grantees will be provided information about the new system.

INQUIRIES

Questions concerning this solicitation should be addressed, preferably via e-mail, to the following NSF program officers, members of the Urban Research Initiative Working Group:

  Frank Scioli (fscioli@nsf.gov, 703-306-1761), Working Group Chairman, Directorate for Social, Behavioral and Economic Sciences

Daniel D. Burke (dburke@nsf.gov, 703-306-1602), Directorate for Education and Human Resources

Les Gasser (lgasser@nsf.gov, 703-306-1927), Directorate for Computer and Information Science and Engineering

Bruce P. Hayden (bphayden@nsf.gov, 703-306-1480), Directorate for Biological Sciences

L. Douglas James (ldjames@nsf.gov, 703-306-1549), Directorate for Geosciences

Priscilla P. Nelson (pnelson@nsf.gov, 703-306-1361), Directorate for Engineering

W. Lance Haworth (lhaworth@nsf.gov, 703-306-1815Directorate for Mathematical and Physical Sciences

APPENDIX 1: Merit Review Criteria

The National Science Board approved revised criteria for evaluating proposals submitted to NSF at its meeting on March 28, 1997 (NSB97-72). The revised criteria are designed to be useful and relevant across NSF's many different programs, however, NSF will continue to employ special criteria as required to highlight the specific objectives of certain programs and activities.

The revised merit review criteria are listed below. Following each criterion are potential considerations that the reviewer may employ in the evaluation. These are suggestions and not all will apply to any given proposal. Each reviewer will address only those that are relevant to the proposal and for which he/she is qualified to make judgments.

What is the intellectual merit and quality of the proposed activity?

How important is the proposed activity to advancing knowledge and understanding within its own field and across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity? Is there sufficient access to resources?

What are the broader impacts of the proposed activity?

How well does the activity advance discovery and understanding while promoting teaching, training, and learning? How well does the proposed activity broaden the participation of underrepresented groups (e.g., gender, ethnicity, geographic, etc.)? To what extent will it enhance the infrastructure for research and education, such as facilities. instrumentation, networks, and partnerships? Will the results be disseminated broadly to enhance scientific and technological understanding? What may be the benefits of the proposed activity to society?

OTHER INFORMATION

The Foundation provides awards for research and education in the sciences and engineering. The awardee is wholly responsible for the conduct of such research and preparation of the results for publication. The Foundation, therefore, does not assume responsibility for the research findings or their interpretation.

The Foundation welcomes proposals from all qualified scientists and engineers and strongly encourages women, minorities, and persons with disabilities to compete fully in any of the research and education related programs described here. In accordance with federal statutes, regulations, and NSF policies, no person on grounds of race, color, age, sex, national origin, or disability shall be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving financial assistance from the National Science Foundation.

Facilitation Awards for Scientists and Engineers with Disabilities (FASED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF projects. See the program solicitation or contact the program coordinator at (703) 306-1636.

Privacy Act

The information requested on proposal forms is solicited under the authority of the National Science Foundation Act of 1950, as amended. It will be used in connection with the selection of qualified proposals and may be disclosed to qualified reviewers and staff assistants as part of the review process; to applicant institutions/grantees; to provide or obtain data regarding the application review process, award decisions, or the administration of

awards; to government contractors, experts, volunteers, and researchers as necessary to complete assigned work; and to other government agencies in order to coordinate programs. See Systems of Records, NSF 50, Principal Investigators/Proposal File and Associated Records, and NSF-5 1, 60 Federal Register 4449 (January 23, 1995). Reviewer/Proposal File and Associated Records, 59 Federal Register 8031 (February 17, 1994).

Public Burden

Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of your receiving an award.

The public reporting burden for this collection of information is estimated to average 120 hours per response, including the time for reviewing instructions. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to:

Gail A. McHenry
Reports Clearance Officer
Information Dissemination Branch
National Science Foundation
4201 Wilson Boulevard, Suite 245
Arlington, VA 22230

The National Science Foundation has TDD (Telephonic Device for the Deaf) capability, which enables individuals with hearing impairment to communicate with the Foundation about NSF programs, employment, or general information. To access NSF TDD, dial (703) 306-0090; for FIRS, 1-800-877-8339.

This program is described in the Catalog of Federal Domestic Assistance categories: 47.041 (ENG), 47.049 (MPS), 47.050 (GEO), 47.070 (CISE), 47.074 (BIO), 47.075 (SBE), and 47.076 (EHR).

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