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# Urban Systemic Program in Science, Mathematics, and Technology Education (USP)

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**A Foundation for K-12 Science and Mathematics  
Educational System Reform**

## ***Program Solicitation***

NSF 01-15

DIRECTORATE FOR EDUCATION AND HUMAN RESOURCES  
DIVISION OF EDUCATIONAL SYSTEM REFORM

**PROPOSAL DEADLINE: 5:00 PM LOCAL TIME JANUARY 31, ANNUALLY**



**NATIONAL SCIENCE FOUNDATION**



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# SUMMARY OF PROGRAM REQUIREMENTS

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## GENERAL INFORMATION

**Program Title:** Urban Systemic Program in Science, Mathematics, and Technology Education (USP)

### Synopsis of Program:

The USP is a **K-12-based program** that promotes systemic reform of science and mathematics education for all students. The USP also includes programmatic components that seek to foster partnerships between urban school districts and two- and four-year colleges and universities and embed research on educational practice and learning.

### Cognizant Program Officer(s):

- Celeste Pea, Program Officer, Room 875, Division of Educational System Reform, telephone number (703) 292-5186, e-mail: [cpea@nsf.gov](mailto:cpea@nsf.gov)

### Applicable Catalog of Federal Domestic Assistance (CFDA) Number:

- 47.076 --- Education and Human Resources

## ELIGIBILITY INFORMATION

- **Organization Limit:** Only urban school districts that serve a central city as determined by National Center for Educational Statistics' Metropolitan Statistical Area data are eligible to apply through this program announcement.
- **PI Eligibility Limit:** The proposal will originate from the Office of the Superintendent or other designated as the Chief School Officer who must serve as the Principal Investigator.
- **Limit on Number of Proposals:** Only one proposal may be submitted per eligible district(s) that serves a central city.

## AWARD INFORMATION

- **Anticipated Type of Award:** Cooperative Agreement
- **Estimated Number of Awards:** 10-15
- **Anticipated Funding Amount:** \$45,000,000 pending availability of funds

## PROPOSAL PREPARATION AND SUBMISSION INSTRUCTIONS

### *A. Proposal Preparation Guidelines*

- **Proposal Preparation Instructions:** Standard Preparation Guidelines
- Standard GPG Guidelines apply.

### *B. Budgetary Information*

- **Cost Sharing Requirements:** A 20 percent Cost Share is Required
- **Indirect Cost (F&A) Limitations:** Not Applicable.
- **Other Budgetary Limitations:** See Section V. Proposal Preparation (C.4)

### *C. Deadline/Target Dates*

- **Letter of Intent Due Date(s):** None
- **Preproposal Due Date(s):** None
- **Full Proposal Due Date(s):** 5:00 PM Local time, January 31, Annually

### *D. FastLane Requirements*

- **FastLane Submission:** FastLane Submission Required
- **FastLane Contact(s):** Ramona Lyon, (703) 292-5184, rlyon@nsf.gov

## PROPOSAL REVIEW INFORMATION

- **Merit Review Criteria:** See Section VI. Proposal Review (A and B)

## AWARD ADMINISTRATION INFORMATION

- **Award Conditions:** Standard NSF award conditions apply.
- **Reporting Requirements:** Standard NSF Reporting Requirements apply.

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# Urban Systemic Program

## I. INTRODUCTION

Science and technology are bringing about dramatic changes in American society. In an increasingly technology-oriented society, a basic understanding of science and mathematics is essential to maintain a population prepared to meet the need for a technically competent workforce and to exercise the responsibilities of citizenship in a modern democracy. Emerging jobs require higher skill levels and greater understanding in science, mathematics, engineering and technology (SMET) education than ever before. More effective education and human resources initiatives are necessary if the U. S. is to maintain its technological leadership in the world marketplace.

The National Science Foundation (NSF) is committed to providing strong and continuing leadership and support for the nation's efforts to improve SMET education and general scientific and mathematical literacy. The Directorate for Education and Human Resources (EHR) has primary responsibility for NSF's educational activities. The programs supported by EHR span preschool through professional levels. Programs include student-centered activities, curriculum and instructional materials development, informal science education, teacher and faculty enhancement, and comprehensive systemic improvement efforts at the precollege and undergraduate levels. Activities range from programs to improve public science literacy to those designed to enhance the diversity and the preparation of the Nation's scientists, mathematicians, and engineers.

Within EHR, the Division of Educational System Reform (ESR) serves as a focal point for the Directorate's systemic reform efforts by managing large-scale programs designed to strengthen the science, mathematics and technology education infrastructure of states, urban centers, and rural areas. The programmatic activities of ESR have focused on enabling states, rural areas, and cities to initiate comprehensive efforts for making lasting improvements in their science, mathematics, and technology education.

Systemic reform of education is an important part of any strategy to provide sustainable improvements in the nation's educational enterprise. *Systemic* refers to fundamental, comprehensive and coordinated changes in education through attendant changes in policy, financing, governance, management, content, and conduct. *Systemic reform* occurs when all essential features of schools and school systems are engaged and operating in concert; when policy is aligned with a clear set of goals and standards; when the forthcoming improvements and innovations become intrinsic parts of the ongoing educational system for all children; and when the changes become part of the school system's operating budget. ESR addresses systemic reform of science, mathematics, and

technology education, both as individual fields of study and as integral parts of broader educational programs.

This solicitation describes a key component of the ESR's effort, the Urban Systemic Program (USP) in Science, Mathematics, and Technology Education. It derives from the merger of two past efforts, the Urban Systemic Initiatives Program (USI) and the Comprehensive Partnerships for Mathematics and Science Achievement (CPMSA). Through the USP effort, NSF seeks to stimulate interest, increase participation, improve achievement, and accelerate career advancement and success for all students of the participating urban school districts.

## **II. PROGRAM DESCRIPTION**

The USP is a **K-12-based program** that promotes systemic reform of science and mathematics education for all students. The USP also includes programmatic components that seek to foster partnerships between urban school districts and two- and four-year colleges and universities and that embed research on educational practice and learning.

The importance of the USP is made manifest by the fact that urban school systems enroll nearly half of all public school students in the United States. Although some progress is being made, there is a continued disparity between the academic performance of these students in both science and mathematics and that of their counterparts in suburban schools. This disparity has been linked to a number of factors including uneven allocation of resources, lack of highly qualified and experienced teachers, low enrollment in advanced courses, inadequate curriculum materials, lack of equipment and poor facilities, and few role models. The USP affords the opportunity to build on NSF's existing connections to both the research and education communities and on its years of experience with the USI program and CPMSA program to achieve sustained improvements in the quality of science and mathematics teaching and learning in K-12 urban school districts.

In the years in which EHR offered the USI program and the CPMSA program, a number of findings emerged as important to the successful implementation of systemic reform. Premier among these findings was that a high-quality mathematics and science program, inclusive of the curriculum, instruction, and assessment, was essential to obtain improved performance by all students. Also prominent among the findings was the critical need for the reform process to be informed by research conducted on classroom practice.

It also became evident that the implementation of a systemic initiative required the building of solid leadership and expertise at all levels, including the school principal as a necessary leader, in order to promote and sustain reform efforts over time. Furthermore, it became increasingly clear that success in reform

required extensive use of data to identify and define areas within the system in need of immediate redesign and restructuring.

The USP incorporates features in its program design that capture these findings. The USP goals are:

- (1) To substantially increase student achievement in the fields of science, mathematics, and technology, as measured by higher scores on standards-based assessments, increasing enrollment in higher level courses, and greater articulation to institutions of higher education;
- (2) to improve and/or advance urban school districts' implementation of a standards-based, inquiry-centered science, mathematics, and technology education for all students K-12 and to employ research as an effective tool in improving the teaching and learning of science and mathematics;
- (3) to increase the competency and diversity of the science and mathematics instructional workforce and to increase the number of skilled entrants to the technology-based workforce; and
- (4) promote collaborations with colleges and universities to improve their approach to teacher education.

### **Core Elements of USP Activity**

Urban school districts that serve a central city are encouraged to respond to this program solicitation by developing a district-wide K-12-based science and mathematics program for all students. These urban school district proposals must demonstrate compellingly that, to a significant degree, an infrastructure for reform is in place and that the implementation of a standards-based curriculum in science and mathematics **is underway district-wide** at the school system level. The plan must also clearly illustrate how the implementation of a high-quality science and mathematics program for all students will be advanced via the proposed plan (see proposal preparation section).

NSF intends to allow maximum flexibility in the design of efforts to address the K-12 science and mathematics educational continuum, as long as the goals and objectives of the Urban Systemic Program are achieved. Differences in the structure and content of proposed programs will be governed by the differences in institutional and organizational capabilities of the urban areas and by the needs specific to the target groups. However, in all cases, submitting districts must demonstrate how these activities will lead to improvement in student achievement in science and mathematics.

Districts must provide:

- Evidence of the use of district-wide profiles or strategies to determine the degree to which a standards-based science and mathematics curriculum is being implemented, including a mechanism for evaluating the system's science and mathematics education infrastructure, instructional workforce needs, and the instructional workforce's competency and capacity to deliver the curriculum.
- Pertinent information regarding the use of an established district-wide accountability plan that relies heavily on an array of assessment measures to document student progress, including baseline data on science and mathematics student achievement.
- A statement of all policies that support a high quality SMET education for all students and identification of strategies to ensure that policies are implemented.
- Evidence of the convergence of resources in support of a unitary program for science and mathematics education.
- A leadership plan for assisting principals in their roles as educational leaders.
- A well-developed teacher and student support system.
- Ongoing and effective strategies for community engagement, outreach, and parent involvement.
- An established or emerging plan for developing effective partnerships in support of standards-based science and mathematics teaching and learning.

### **Activities Involving the Higher Education Community**

Districts that respond to this solicitation should include in their plan how institutions from the higher education community will be embedded in the reform process. Collaboration with these institutions may include:

- (1) *Efforts that involve two-year colleges in improving technological education at the high school level.* These activities may include the implementation of new curricula, courses, laboratories, instructional materials, opportunities for faculty and teacher development, academic support for students, and formal cooperative arrangements among educational institutions and partners from business, industry, and government sectors. With the growing need for entrants in technological fields, two-year institutions are expected to support a broad range of technical activities such as: biotechnology, chemical technology, computer and information technology, electronics, environmental

technology, geographic information systems, manufacturing, and telecommunications. These programs should be designed to meet local technological workforce needs while being cognizant of the technical skills needed for global competitiveness.

- (2) *Activities developed jointly by urban school districts in collaboration with four-year colleges and universities.* These activities should be aimed at revising and developing strategies that in the short term will address localized shortages of a highly trained and diverse science and mathematics teacher cadre. Moreover, strategies should impact all aspects of teacher preparation from course offerings to at least a two-year teacher induction program. The local K-12 system should use district profiles, student achievement data, curriculum/instructional materials, and other critical elements to assist institutions of higher education with teacher preparation programs in a collaborative effort to ensure that new teachers are prepared to deliver a high-quality science and mathematics curriculum for all students. Colleges and universities will also be expected to develop programs that address the lack of desired depth of content knowledge in the existing instructional workforce, and to encourage a greater number of high school students to select the teaching of science and mathematics as a career option.
- (3) *The use of graduate students and postdoctoral personnel in science, mathematics, engineering, and technology disciplines to assist in expanding K-12 teachers' understanding and depth of content knowledge of fundamental principles of science and mathematics.*
- (4) *Support for research on practice should be embedded in the K-12 plan.* The intent is to involve urban school districts and college and university-based personnel in designing research activities to increase the knowledge base on educational system reform, thus contributing to the assessment of urban systemic programming outputs and outcomes. Such collaborations might afford research experiences for K-12 students and teachers in science and mathematics.

Possible areas of research include: 1) examining practices and policies that are likely to lead to a high-quality science and mathematics program for all students; 2) assessing the capacity of the system and the instructional workforce to implement a standards-based science and mathematics education for all students; 3) managing funds from multiple resources in support of a standards-based unitary program for science and mathematics education; 4) developing effective instruments for measuring the degree to which reform efforts are integrated into classroom practice; 5) identifying factors that influence the development of a dynamic infrastructure for change; 6) identifying strategies to establish credible evidence for student performance; 7) ascertaining the impact of reform efforts on the achievement gap among sub-populations of students; 8) determining the impact of

technology as a tool to improve science and mathematics teaching and learning; and 9) some combination of the aforementioned issues bearing on classroom practices, midcourse corrections, and/or overall systemic reform.

- (5) A **local** advisory committee to assist a district in the implementation and assessment of proposed activities. Should the district elect to organize an advisory committee, there should be adequate representation from all groups that have responsibility for the design and implementation of the educational program in the system. This could include teachers and school system administrators, science and mathematics educators from institutions of higher education, practicing engineers and scientists, leaders of parent- and community-based educational organizations, and representatives from local business and industry. Prospective candidates for the committee must be identified in the proposal. The superintendent or chief school officer must be a member of this committee.

### III. ELIGIBILITY INFORMATION

- A. The proposal must be submitted by a school district that serves a central city, enrolling at least **20,000 students** as determined by current data from the U. S. Department of Education's National Center for Education Statistics (see <http://nces.ed.gov/ccdweb/school/district.asp>). A consortium of urban school districts that serve the same central city may apply if deemed useful and appropriate. At least one of the participating districts in the consortium must meet the 20,000-student population requirement and serve as the lead institution. The minimum student population requirement cannot be obtained by adding smaller districts with a student population of less than 20,000.
- B. School districts that have previously received USI or CPMSA awards are eligible to apply to the USP.
- C. The proposal should originate from the Office of the Superintendent or other official who is designated as the Chief School Officer who agrees to serve as the Principal Investigator. A waiver of this requirement will be granted only if there are strong and compelling reasons. A USP Program Director must be contacted prior to the submission of the proposal if such a waiver is needed.
- D. The proposal must meet a cost-share requirement of 20% of the proposed budget request. Proposed cost-sharing must be non-federal funds and consistent with OMB Circular A-110 and will be subject to audit.

### IV. AWARD INFORMATION

Under this solicitation, NSF solicits proposals from eligible urban school districts for up to five years. Awards will depend on the estimated NSF program budget, the number of awards and average award size/duration are subject to the availability of funds and the quality of submissions. The announcement of USP

awards will be made by the Foundation normally within six months following the proposal deadline. Awards will be administered through cooperative agreements.

Urban school districts may request up to \$3,000,000 per year as determined by specified activities supported by the proposal and the size of the school district.

<u>Size of School District Enrollment</u>	<u>Level of Funding Per Year</u>
20,000 - 100,000	up to \$1,000,000
100,001 - 150,000	up to \$2,000,000
150,001 - 1,000,000	up to \$3,000,000

**Type of award anticipated:** Cooperative Agreement

**Number of awards anticipated in FY 2001:** 10-15

**Amount of funds available in FY 2001:** Approximately \$45,000,000 pending availability of funding.

**Anticipated date of award:** August 1, annually

Future year support will be contingent upon the availability of funding and acceptable progress in meeting program objectives as determined by monitoring and evaluation activities conducted by NSF program staff, consistent with the terms and conditions of the cooperative agreement.

## **V. PROPOSAL PREPARATION & SUBMISSION INSTRUCTIONS**

### **A. Proposal Preparation Instructions**

Full Proposal Instruction

Proposals submitted in response to this program solicitation should be prepared and submitted in accordance with the general guidelines contained in the *Grant Proposal Guide* (GPG). The complete text of the GPG (including electronic forms) is available electronically on the NSF Web site at: <http://www.nsf.gov/cgi-bin/getpub?nsf012>. Paper copies of the GPG may be obtained from the NSF Publications Clearinghouse, telephone 301.947.2722 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

Proposers are reminded to identify the program solicitation number (NSF01-15) in the program solicitation block on the NSF Form 1207, "*Cover Sheet for Proposal to the National Science Foundation*." Compliance with this requirement

is critical to determining the relevant proposal processing guidelines. Failure to submit this information may delay processing.

All proposals described in this document must contain the following sections as described fully in the GPG:

- ❑ Information about the principal investigator(s) and project director(s).
- ❑ A two-page cover sheet (NSF Form 1207). The NSF organizational units that should be selected are the "Division of Educational System Reform" and the "Urban Systemic Program."
- ❑ Project Summary. It should not exceed 200 words and should be placed on a separate page. The heading should include the name of the initiative, the name of the urban and the congressional district, the submitting organization, and the name, address, and telephone number of the principal investigator.
- ❑ Table of Contents. The Table of Contents will be created automatically in FastLane.
- ❑ Project Description. The Project description must not exceed **15 single-spaced pages** (30 double-spaced pages are not acceptable). Proposals exceeding the page limitation will not be considered. See Section B for information about required elements in the Project Description.
- ❑ A brief (no more than two pages) bibliography of pertinent literature.
- ❑ A biographical sketch for each senior personnel involved as principal investigators, principal coinvestigators, or project director(s), or having a major administrative, instructional, or consulting responsibility to the initiative. Individual vitae must not exceed two pages and may include a list of up to five publications most closely related to the proposed initiative.
- ❑ Budget Form 1030. This must be provided for each annual budget and for the cumulative budget for all years of the initiative. In FastLane, the type of budget (i.e. Year 1, Year 2, etc., and the cumulative budget) is printed at the top of the budget form. **A Complete Budget Form 1030 is required for each proposed subaward.** The proposed principal investigator for the subaward and an authorized organizational representative must sign the form.
- ❑ Brief Budget Justification Pages that provide detailed clarifying information for the funds requested on each line of Budget Form 1030. Detailed explanation should also be provided for the funds requested for each sub-award proposed as a part of the budget. Since the USP requires leveraging of existing funds, a clear discussion of cost-sharing is essential in each subaward.

- Statement of Current and Pending Support (NSF Form 1239).
- Supplementary Documentation. Materials included in the supplementary documentation section must be held to a minimum and must not be used to circumvent the **15-page** limitation. The supplementary documentation section should be clearly labeled and placed at the end of the proposal. In FastLane, the supplementary documentation section can be uploaded as a separate PDF file. It should include:
  - (1) a timeline for initiative activities;
  - (2) a list of collaborators within the past 48 months, including their roles and specific support for the proposal;
  - (3) disaggregated student participation and achievement data (from the previous year) to determine how subgroups of students are doing and to serve as a baseline for pinpointing both successes and failures. While such data will not provide full explanations in and of themselves, they will afford critical starting points for looking at system change and identify opportunities for moving forward. Hence, baseline data must be provided on the most recent student achievement in mathematics and science in comparison to state and/or national averages. The data should identify the type of test (norm- or criterion-referenced) and indicate each of the grade levels in which system-wide science and mathematics assessments were administered. It should include achievement scores disaggregated by ethnic group and gender, the percentage of students tested against grade-level enrollment, and the appropriate categories for reporting test results (quartiles, means percentiles, proficiency levels, or above or below cut scores). Where possible comparison to state and national norms should be made. Baseline data may also include course enrollment and completion rates. The baseline data should be reported on three to five pages with specific references in the narrative of the proposal. Legends, footnotes, and other identifying characteristics must be included to provide full explanations of student achievement data; and
  - (4) letters of commitment.

## **B. Supplemental Instructions for the Project Description**

*The project description of USP proposals must demonstrate explicitly the school district's K-12 plan for reform and contain the following elements:*

### **1. Overview (up to one-half page)**

This brief section should describe the need for the USP in the specific locale, and what the proposer plans to accomplish. It should also provide a brief description

bearing on the school system, its strengths and weakness, and characterize the physical, social, cultural, political, and intellectual environments in which the USP will operate.

## **2. Planning History (up to one page)**

This section should briefly describe the process and results of planning by which the district(s) and selected partners developed a shared vision for establishing the reform agenda for the K-12 system. This planning phase description should identify key participants, committees and other working groups established; highlight milestones, obstacles, kinds and scope of data to be used to inform decisions; and describe other emerging mechanisms to help achieve program goals. Included in this section should also be information relative to exemplary local, state, regional, and national programs that might be useful to the efforts being proposed and characteristics of systems that have made significant progress towards systemic reform.

## **3. Goals, Objectives and Benchmarks**

This section should address both short-term and long-range goals and objectives. Specific benchmarks should be established to guide the implementation process over the course of the funding period. Should the ultimate goals require more than the five-year funding period for completion, proposers must develop interim goals to help determine whether the initiative is progressing successfully towards the achievement of specific outcomes. Each urban school district is required to include baseline data and performance benchmarks that will allow it to determine the origination point and to assess progress towards achievement of its goals and objectives. (Please see the Supplementary Documentation section for details.)

## **4. Results from Prior NSF Funding**

If the proposers received prior funding from NSF in the last five years, information on the prior award is required if relevant to the proposed scope of work (see Grant Proposal Guide NSF 00-2; Page 8). Up to **five** pages may be used to describe these results particularly if they supported the establishment of the infrastructure for science, mathematics, and technology. Results may be summarized in *fewer* than five pages, which will give the proposers the balance of the 15 pages for the instructional program description.

## **5. The K-12 Instructional Program Design Plan**

NSF considers successful systemic reform to result in full implementation of the six critical drivers identified by the Foundation through its systemic initiative (SI) programs. Submitting school districts should use these critical developments to

determine the status of their current reform efforts. The six critical developments include:

- (1) Implementation of a comprehensive, standards-based curriculum and/or instructional materials that are aligned with instruction and assessment available to every student served by the system and its partners.*
- (2) Development of a coherent, consistent set of policies that supports provisions of broad-based reform of mathematics and science at the K-12 level.*
- (3) Convergence of all resources that are designed for or that reasonably could be used to support science and mathematics education—fiscal, intellectual, materials—both in formal and informal education settings—to upgrade and continually improve the educational program in science and mathematics for all students.*
- (4) Broad-based support from parents, policymakers, institutions of higher education, business and industry, foundations, and other segments of the community.*
- (5) Accumulation of a broad and deep array of evidence that the initiative is enhancing student achievement through a set of indices (e.g., achievement test scores, higher level courses passed, advanced placement tests taken, college admission rates, college majors, portfolio assessment, research experiences, ratings from summer employers). Awardees shall report, on an annual basis, the results of student mathematics and science achievements in a manner that allows comparison between SI-impacted and non-SI-impacted schools/districts.*
- (6) Improvement in the achievement of all students, including those historically underserved, as evidenced by progressive increments in student performance.*

Proposing urban school districts must provide in this section compelling evidence that clearly demonstrates that, to a significant degree, an infrastructure for reform is in place and that the implementation of a standards-based curriculum in science and mathematics **is underway district-wide** at the school system level. An established infrastructure for reform consists of a standards-based science and mathematics K-12 curriculum (inclusive of content, instruction, and assessment), a set of policies in support of the curriculum, evidence of the convergence of fiscal and intellectual resources, and the existence of effective partnerships in support of a single instructional program for science, mathematics, and technology. Proposing districts must also provide a compelling plan for advancing the implementation of the proposed plan. The plan must build on the infrastructure described above and illustrate how the

scope of work will lead to full-scale implementation of a high-quality science and mathematics program for all students.

Careful consideration must be given to and evidence provided to demonstrate how support through this proposal would facilitate the achievement of the goals of the USP. For example, an urban district may have completed its infrastructure but may not have reached the level of capacity and competency in its instructional workforce to ensure full delivery of the standards-based curriculum. Thus, funding from NSF would be used to augment existing state, district, and other federal funds devoted to the needed activities. Another system may have completed its infrastructure but may need assistance in the infusion of technology into the teaching and learning of science and mathematics, while another may need assistance in enhancing the diversity and number of teachers and skilled entrants in the science and mathematics instructional and technological workforce.

## **6. Implementation Process**

The implementation process may involve a wide variety of creative and flexible approaches to the reform of science and mathematics education. It is important that proposers consider a number of diverse organizations, schedules, activities, and strategies that will support, nurture, and sustain new delivery systems. Examples might include the use of technology, staggered work hours, differentiated staffing, special school release time, before and after school extended day programs, summer, and academic-year enrichment programs, and community service and transition programs. Special attention should be given to the reallocation of teaching resources to ensure maximum student-teacher interactions.

## **7. Project Management and Staffing**

The proposal should originate from the office of the superintendent or the chief executive officer who agrees to serve as the principal investigator. A waiver of this requirement will be granted only if there are strong and compelling reasons. A USP Program Director must be contacted to discuss the request for a waiver prior to the submission of the proposal. Key USP personnel as well as other persons that have an active role in policy and budgetary decisions, the implementation, monitoring, and evaluation of proposed activities, and the assessment of student achievement must have direct access to the principal investigator. It is understood that staffing requirements will depend on the design, scope, and discipline focus; however, staffing should include district and school administrators, teaching, and counseling personnel and faculty from local institutions of higher education. The proposal also should include plans, endorsed by the office of the superintendent or chief school officer, to continue proposed activities after NSF funding has ended and certification that the NSF

funds will not replace extant financial resources devoted to mathematics and science education.

Submitting school districts must also comply with the 1998 Drug-Free Workplace Act and the Federal Conflict-of-Interest requirement (NSF Form 1371).

## **8. Assessment/Accountability**

A detailed plan for collecting, processing, and using appropriate disaggregated data to establish a baseline and assess student progress is critical to the success of an USP. This should include the means by which the system documents, measures, and reports on the system's resources, allocations, programs, policies, procedures, and measurable outcomes as they bear on accountability for science, mathematics, and technology education.

## **C. Budgetary Information**

### **1. General Provisions**

Proposers may request from the Foundation appropriate direct, indirect and participants' costs. Separate budgets must be prepared for each year of award, along with a cumulative five-year budget that must be included on a Budget Form 1030.

General NSF provisions of special relevance to this program as well as additional program specific regulations, are summarized below:

- Allowable costs include staff salaries, consultants, materials and supplies for classroom and laboratory activities linked to professional development, and teacher stipends.
- Indirect costs are allowed but will not be paid on participants' support costs. (Line F, Budget Form 1030)
- Funds should be included for the principal investigator and project directors (up to four people) to attend at least two to three, two-day meetings in Washington, DC. Proposers should use their institutional guidelines regarding allowances or, in the absence of such policies, the rate of \$168/day.

### **2. Cost-Sharing**

Cost-sharing, using non-federal funds, at a level of 20% of the requested total amount of NSF funds is required for all proposals submitted in response to this

solicitation. The proposed cost-sharing must be shown on line M on the proposal budget (Budget Form 1030.)

The types of cost-sharing must be shown in the proposal in enough detail to allow NSF to determine its impact on the proposed initiative. Documentation of availability of cost-sharing must be included in the proposal.

Only items which would be allowable under the applicable cost principles, if charged to the initiative, may be included as the grantee's contribution to cost-sharing. Contributions may be made from any non-Federal source, including non-Federal grants or contracts, and may be cash or in-kind (see OMB Circular A-110, Section 23). It should be noted that contributions counted as cost-sharing toward other projects of a Federal agency may not be counted towards meeting the specific cost-sharing requirements of the NSF grant. Additional funds made available through Federal sources (e.g. Eisenhower Program, Title I and Title II, Perkins and other federal funds) should be specifically identified as leveraging, but not listed as cost-share.

All cost-sharing on awards is subject to audit. Proposed cost-sharing is expected to be obtained as proposed and adequately documented in the awardee accounting system and include appropriate supporting documentation as specified in OMB Circular A-110, Section 23. Failure to provide adequate accounting documentation or documentation in full for the amount of proposed cost-sharing may result in disallowance of award costs resulting in repayment of grants funds to NSF and/or termination of an NSF award if active. Should there be questions regarding cost-sharing, school districts should contact the Foundation's Contracts, Policy, and Oversight Division, Cost Analysis and Audit Resolution Branch (CAAR).

Possible areas for cost-sharing, in addition to financial resources, include staff release time, allowable participant costs, and the purchase of new materials related to proposed activities. The use of school buildings, equipment, and materials during normal hours of operation is not considered cost-sharing. When proposers are considering kinds of cost-sharing, they should consider how it can be documented.

### **3. Indirect Cost Limitations**

Funds allocated to Line F-Participants Support Costs cannot be included when calculating indirect costs.

#### **4. Other Budgetary Limitations**

Support for office equipment to facilitate implementation of proposed plans is limited to **\$20,000** over the life of the award. Funds cannot be used to purchase any general-purpose equipment for any reason. Funds for curriculum or instructional materials must be directly tied to professional development and other activities for teachers of mathematics and science. Purchase of general classroom materials are not allowed. Funds for evaluation of USP programmatic activities are limited to \$75,000 per year (first-year funds should be used exclusively in preparing data-gathering measures to facilitate adequate and accurate evaluation of programmatic activities. Travel funds will be generally limited to 1% of the total award).

#### **5. Other Budgetary Information**

##### **a) Authorized Organizational Representative**

Submitting urban school districts must have a fiscal agent who serves as the authorized organizational representative (AOR). The AOR is the administrative official who, on behalf of the proposing school district, is empowered to make certifications and assurances and can commit the school district to the conduct of the program that NSF is being asked to support as well as adhere to various NSF policies and cooperative agreement requirements. The AOR must sign both the NSF Form 1207 and Budget Form 1030 where indicated. Should there be questions regarding this issue, school districts should contact the Foundation's Division of Grants and Agreements.

##### **b) Subawards**

All sub-awards must be monitored by the submitting school district in accordance with applicable federal cost principles and administrative requirements. Subawards can only be issued to organizations that have fiscal authority and responsibility to account for and handle funds. The receiving organization(s) shall be subject to program audits and fiscal audits. The school district must develop and implement a plan that will ensure close monitoring of all sub-awards. Should there be questions regarding this issue, school districts should contact CAAR.

##### **c) Documentation of Level of Effort**

School districts must maintain personnel activity reports that show each employee's activity or type of work on their job as related to the USP. OMB Circular A-87, *Cost Principles for State and Local Governments*, states that personnel activity reports reflecting each employee's distribution of activity are required for employees whose compensation is charged to federal awards, and

that these activity reports must reflect an after-the-fact distribution of each employee's actual activity. School districts must maintain personnel activity reports so as to decrease the possibility of salaries being incorrectly charged to an award. Should there be questions regarding this issue, school districts should contact CAAR.

## **6. Budget Explanations**

Using the same categories as those listed on the Budget Form 1030, a rationale for the level of NSF support requested for each budget item should be provided. In separate columns, using the same categories, level of support (monetary and in-kind) should be listed that come from the school system and from other sources in direct support of proposed activities.

### **D. Deadline/Target Date**

**Proposals must be submitted by the following date:**

Proposal Deadline: 5:00 PM local time, January 31, Annually

### **E. FastLane Requirements**

Proposers must prepare and submit proposals using the NSF FastLane system. Detailed instructions for proposal preparation and submission via FastLane are available at <http://www.fastlane.nsf.gov/a1/newstan.htm>. For FastLane support, call 1-800-673-6188.

*Submission of Signed Cover Sheets.* For proposals submitted electronically, the signed copy of the proposal Cover Sheet (NSF Form 1207) must be postmarked (or contain a legible mailing date assigned by the carrier) within five working days (February 7, Annually) following proposal submission and be forwarded to the following address:

National Science Foundation  
DIS-FastLane Cover Sheet  
4201 Wilson Blvd.  
Arlington, VA 22230

A proposal may not be processed until the complete proposal (including signed Cover Sheet) has been received by NSF.

The Sponsored Research Office (SRO or equivalent) must provide a FastLane Password to each Principal Investigator (PI) to gain access to the FastLane "Proposal Preparation" application. PIs that have not submitted a proposal to NSF in the past must contact their SRO to be added to the NSF database.

## **VI. PROPOSAL REVIEW INFORMATION**

Proposals received under this solicitation will be reviewed following the general procedures:

### **A. Merit Review Criteria**

Reviews of proposals submitted to NSF are solicited from three or more peers with expertise in the substantive area of the proposed research or education project. NSF invites the proposer at the time of submission, to suggest names of appropriate or inappropriate reviewers. Care is taken to ensure that reviewers have no conflicts with the proposer. Special efforts are made to recruit reviewers from nonacademic institutions, minority serving institutions, adjacent disciplines to that principally addressed in the proposal. Proposals will be reviewed against the following general review criteria established by the National Science Board. 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 be asked to address only those that are relevant to the proposal and for which he/she is qualified to make judgements.

Proposals will be reviewed against the following general merit review criteria established by the National Science Board. 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 be asked to address only those that are relevant to the proposal and for which he/she is qualified to make judgements.

#### **What is the intellectual merit of the proposed activity?**

How important is the proposed activity to advancing knowledge and understanding within its own field or 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, disability, 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?

PIs should address the following elements in their proposal to provide reviewers with the information necessary to respond fully to both NSF merit review criteria. NSF staff will give these factors careful consideration in making funding decisions.

## **Integration of Research and Education**

One of the principal strategies in support of NSF's goals is to foster integration of research and education through the programs, projects and activities it supports at academic and research institutions. These institutions provide abundant opportunities where individuals may concurrently assume responsibilities as researchers, educators, and students and where all can engage in joint efforts that infuse education with the excitement of discovery and enrich research through the diversity of learner perspectives.

## **Integrating Diversity into NSF Programs, Projects and Activities**

Broadening opportunities and enabling the participation of all citizens - women and men, underrepresented minorities, and persons with disabilities - is essential to the health and vitality of science and engineering. NSF is committed to this principle of diversity and deems it central to the programs, projects, and activities it considers and supports.

## **B. Elaboration of Review Criteria**

In elaboration of the general NSF review criteria, reviewers will also be asked to review USP proposals on the basis of the following criteria:

- 1. Is the initiative likely to lead to systemic changes having substantial impact on science, mathematics, and technology education for all students within the subject urban school district?** The plan must demonstrate the existence of a single, well-articulated K-12 program in science and mathematics. It should speak specifically to the following key elements:

**STATUS OF REFORM:** Did the district use the critical developments to determine the current status of reform? Was the existence of an established infrastructure clearly demonstrated? Does the implementation plan illustrate explicitly how the proposed initiative will improve and/or advance the teaching and learning of science and mathematics K-12?

**NEED:** Is there a clearly defined need for the project? Are the district's needs, problems, and issues adequately demonstrated, and reflected in an effective comprehensive planning process?

**RATIONALE:** To what extent does the proposal convey an understanding of the status of the educational infrastructure in the urban school district and of the elements involved in effecting systemic change? Is NSF support necessary and clearly justified?

**VISION:** Is there a clear sense of what the USP expects to accomplish? Is a unified set of concepts, beliefs, and goals regarding science, mathematics, and technology education clearly articulated? Does this vision form the basis of the proposal? Are the proposed changes aligned with relevant state and local standards?

**SCIENTIFIC AND EDUCATIONAL MERIT:** Has the proposer benefited from the best thinking of the mathematics, science, technology, and educational policy communities? Are the proposers knowledgeable about other related efforts at the urban, state, and national levels? Are "proven" approaches to increasing the participation and achievement of underrepresented groups (i.e. minorities, women, and persons with disabilities) in mathematics, science and technology education programs included within the proposal? Have lessons learned from NSF prior efforts been incorporated into proposed plans?

**INSTITUTIONALIZATION:** How will the changes proposed become part of the system? What will they replace? Will the program encourage and facilitate improved and lasting working relationships among the various partners?

2. **Is the proposed staff, especially the project director(s) and other key personnel, qualified to lead this program?** Do they include, and/or have access to, the urban and school district leadership and other key policymakers? Are staff and time allocations sufficient to do the job? Are scientists, mathematicians, engineers as well as educators in these disciplines an integral part of the team?
3. **Have the proposers developed a plan of operation that will lead to the specified changes?** Have they developed a workable management plan with appropriate timelines? Does the school district have the capability to carry out the program? Are proposed subawards necessary and have the proposers developed a plan for administering them?
4. **Have the proposers developed a workable documentation and evaluation plan?** Have they identified both short- and long-term impacts they seek from the changes they propose? How will the impacts be

evaluated? Are criteria for success, such as benchmarks, clearly stated in measurable terms? Is there a process for responding effectively and efficiently to the identified problems? Is formative and summative evaluation provided for? Is there a mechanism to monitor student performance/achievement? Has an appropriate database been established? Is the expertise available to implement it?

5. **Are budgets related to the activities to be carried out? Are the costs appropriate to achieve program outcomes?** Does the budget narrative present detailed justifications, including details of cost-sharing, for each program partner? Does the proposal indicate how resources will be coordinated or developed to achieve the program's goals?
6. **Is the school district's approach likely to lead to the kind of reform necessary to improve the education of all urban youth in mathematics, science, and technology?** Will the initiative result in implementation of quality improvements and products (e.g., educated students able to enter the work force and availability of a sufficiently high level of appropriate courses, professional development strategies, student intervention programs, parent involvement models, new governance structures, and assessment programs)? Will these outcomes be institutionalized? Will others be able to adopt/adapt the approaches?
7. **Is the initiative likely to contribute to lasting improvements in the SMET educational system that result in significantly altering the life patterns of students and the productivity of the national educational enterprise vis-a-vis minorities, women and students with disabilities?**

The NSF staff may solicit further information through site visits, and other means necessary to gather information about a proposal. Other factors that will be considered by staff in selecting the awardees from within substantially similar quality groupings include: (1) the firmness and substance of the commitments from the participating entities, groups, and individuals; and (2) the degree to which the proposed initiative is responsive, original and innovative.

A summary rating and accompanying narrative will be completed and signed by each reviewer. In all cases, reviews are treated as confidential documents. Verbatim copies of reviews, excluding the names of the reviewers, are mailed to the Principal Investigator/Project Director by the Program Director. In addition, the proposer will receive an explanation of the decision to award or decline funding.

### **C. Review Protocol and Associated Customer Service Standard**

All proposals are carefully reviewed by at least three other persons outside NSF who are experts in the particular field represented by the proposal. Reviewers

will be asked to formulate a recommendation to either support or decline each proposal. A Program Officer assigned to the proposal's review will consider the advice of reviewers and will formulate a recommendation. NSF will be able to tell applicants whether their proposal has been declined or recommended for funding within six months for 95 percent of proposals. The time interval begins on the proposal deadline or target date or from the date of receipt, if deadlines or target dates are not used by the program. The interval ends when the Division Director accepts the Program Officer's recommendation. In all cases, after programmatic approval has been obtained, the proposals recommended for funding will be forwarded to the Division of Grants and Agreements for review of business, financial and policy implications and the processing and issuance of a grant or other agreement. Proposers are cautioned that only a Grants and Agreements Officer may make commitments, obligations, or awards on behalf of NSF or authorize the expenditure of funds. No commitment on the part of NSF should be inferred from technical or budgetary discussions with an NSF Program Officer. A Principal Investigator or organization that makes financial or personnel commitments in the absence of a grant or cooperative agreement signed by the NSF Grants and Agreements Officer does so at its own risk.

## **VII. AWARD ADMINISTRATION INFORMATION**

### **A. Notification of the Award**

Notification of the award is made *to the submitting organization* by a Grants Officer in the Division of Grants and Agreements. Organizations whose proposals are declined will be advised as promptly as possible by the cognizant NSF Division administering the program. Verbatim copies of reviews, not including the identify of the reviewers, will be provided automatically to the Principal Investigator. (See section VI.A, for additional information on the review process.)

### **B. Award Conditions**

An NSF cooperative agreement consists of: (1) the award document, which includes any special provisions applicable to the cooperative agreement and any numbered amendments thereto; (2) the budget, which indicates the amounts, by categories of expense, on which NSF has based its support (or otherwise communicates any specific approvals or disapprovals of proposed expenditures); (3) the proposal referenced in the award document; (4) the applicable award conditions, Grant General Conditions (NSF GC-1)\*, or Federal Demonstration Partnership (FDP) Terms and Conditions\* and (5) any NSF brochure, program guide, solicitation or other NSF issuance that may be incorporated by reference in the award document. Cooperative agreement awards also are administered in accordance with NSF Cooperative Agreement Terms and Conditions (CA-1). Electronic mail notification is the preferred way to transmit NSF awards to

organizations that have electronic mail capabilities and have requested such notification from the Division of Grants and Agreements.

These documents may be accessed electronically on NSF's Web site at: <<http://www.nsf.gov/home/grants/grantsgac.htm>. Paper copies may be obtained from the NSF Publications Clearinghouse, telephone 301.947.2722 or by e-mail from [pubs@nsf.gov](mailto:pubs@nsf.gov).

More comprehensive information on NSF Award Conditions is contained in the NSF *Grant Policy Manual* (GPM) Chapter II, (NSF 95-26) available electronically on the NSF Web site at <http://www.nsf.gov/cgi-bin/getpub?gpm>. The GPM also is for sale through the Superintendent of Documents, Government Printing Office, Washington, DC 20402. The telephone number at GPO for subscription information is (202) 512-1800. The GPM may be ordered through the GPO Web site at: <<http://www.gpo.gov>>.

### **C. Reporting Requirements**

For all multiyear awards (including both standard and continuing grants), the PI must submit an annual report to the cognizant Program Officer at least 90 days before the end of the current budget period. Within 90 days after expiration of an award, the PI is also required to submit a final project report. Approximately 30 days before expiration, NSF will send a notice to remind the PI of the requirement to file a final project report. Failure to provide final technical reports delays NSF review and processing of pending proposals for that PI. PIs should examine the format of the required reports in advance to assure availability of required data.

NSF has implemented a new electronic project report system, available through FastLane. This system permits electronic submission and updating of project reports, including information on: project participants (individual and organizational); activities and findings; publications; and, other specific products and contributions. PIs will not need to re-enter information previously provided, either with the proposal or in earlier updates using the electronic system.

## **VIII. CONTACTS FOR ADDITIONAL INFORMATION**

General inquiries should be made to the **Urban Systemic Program**, Celeste Pea, Program Officer, Room 875, Division of Educational System Reform, National Science Foundation, Arlington, VA 22230, telephone 703-292-5186, e-mail: [cpea@nsf.gov](mailto:cpea@nsf.gov). For questions related to use of FastLane, contact Ramona Lyons by telephone 703-292-5184, or by e-mail [rlyon@nsf.gov](mailto:rlyon@nsf.gov).

## **IX. OTHER PROGRAMS OF INTEREST**

The NSF Guide to Programs is a compilation of funding for research and education in science, mathematics, and engineering. The NSF Guide to Program is available electronically at <http://www.nsf.gov/cgi-bin/getpub?gp>. General descriptions of NSF programs, research areas, and eligibility information for proposal submission are provided in each chapter. Many NSF programs offer announcements concerning specific proposal requirements. To obtain additional information about these requirements, contact the appropriate NSF program offices. Any changes in NSF's fiscal year programs occurring after press time for the Guide to Programs will be announced in the NSF E-Bulletin, which is updated daily on the NSF web site at <http://www.nsf.gov/home/ebulletin>, and in individual program solicitations. Subscribers can also sign up for NSF's Custom News Service (<http://www.nsf.gov/home/cns/start.htm>) to be notified of new funding opportunities that become available.

### **ABOUT THE NATIONAL SCIENCE FOUNDATION**

The National Science Foundation (NSF) funds research and education in most fields of science and engineering. Awardees are wholly responsible for conducting their project activities and preparing the results for publication. Thus, the Foundation does not assume responsibility for such findings or their interpretation.

NSF welcomes proposals from all qualified scientists, engineers, and educators. The Foundation strongly encourages women, minorities, and persons with disabilities to participate fully in its programs. 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 subjected to discrimination under any program or activity receiving financial assistance from NSF (unless otherwise specified in the eligibility requirements for a particular program).

Facilitation Awards for Scientists and Engineers with Disabilities (FASSED) provide funding for special assistance or equipment to enable persons with disabilities (investigators and other staff, including student research assistants) to work on NSF-supported projects. See the program solicitation for further information.

The National Science Foundation has Telephonic Device for the Deaf (TDD) and Federal Information Relay Service (FIRS) capabilities that enable individuals with hearing impairments to communicate with the Foundation about NSF programs,

employment or general information. TDD may be accessed at (703) 292-5090 or (800) 281-8749, FIRS at 1-800-877-8339.

The National Science Foundation is committed to making all of the information we publish easy to understand. If you have a suggestion about how to improve the clarity of this document or other NSF-published materials, please contact us at plainlanguage@nsf.gov.

The catalog of Federal Domestic Assistance Number is 47.076, Education and Human Resources.

### **PRIVACY ACT AND PUBLIC BURDEN STATEMENTS**

The information requested on proposal forms and project reports is solicited under the authority of the National Science Foundation Act of 1950, as amended. The information on proposal forms will be used in connection with the selection of qualified proposals; and project reports submitted by awardees will be used for program evaluation and reporting within the Executive Branch of Congress. This information requested may be disclosed to qualified reviewers and staff assistants as part of the proposal review process; to proposer institutions/grantees to provide or obtain data regarding the proposal review process, award decisions, or the administration of awards; to government contractors, experts, volunteers, and researchers and educators as necessary to complete assigned work; to other government agencies needing information as part of the review process or in order to coordinate programs; and to another Federal agency, court or party in a court or Federal administrative proceeding if the government is a party. Information about Principal Investigators may be added to the Reviewer file and used to select potential candidates to serve as peer reviewers or advisory committee members. See Systems of Records, NSF 50, "Principal Investigators/Proposal File and Associated Records," 63 Federal Register 267 (January 5, 1998), and NSF-51, "Reviewer/Proposal File and Associated Records," 63 Federal Register 268 (January 5, 1998). Submission of the information is voluntary. Failure to provide full and complete information, however, may reduce the possibility of your receiving an award.

Pursuant to 5 CFR 1320.5 (b), an agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid OMB control number. The OMB control number for this collection is 3145-0058. 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: Suzanne Plimpton, Reports Clearance Office, Information Dissemination Branch,

Division of Administrative Services, National Science Foundation Arlington, VA 22230, or to Office of Information and Regulatory Affairs of OMB, Attention: Desk Officer for National Science Foundation (3145-0058), 725 - 17<sup>th</sup> Street. N. W. Room 10235, Washington, D.C. 20503.

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