

Slide 1: Webinar: 2016 Smart and Connected Communities (S&CC) Program Solicitation (16-610)

DAVID CORMAN: Welcome everyone and good afternoon! We are glad you could join us for this webinar focused on NSF's Smart and Connected Communities (S&CC) Program Solicitation. I'm David Corman, a Program Director for the Computer Network and Systems Division, in the Computer and Information Science and Engineering Directorate at NSF.

Before we start, I want to discuss a few housekeeping guidelines: The webinar will be 1 hour in duration, we will present for approximately 40 minutes, and then the remainder of the time will be dedicated to a question-and-answer (Q&A) session with participants. That said, please save your questions until the end of the presentation.

The Q&A session will be guided by the operator, so please follow the instructions from them for that part of the webinar. We have a large number of participants on the call today, so there may be a delay before you get an opportunity to ask a question. A few frequently asked questions (FAQ) have been populated and will be reviewed at the end of the webinar. A summary list of the questions and answers will be published on the S&CC solicitation Home Page within the next three weeks.

To kick off today's webinar, I want to introduce Dr Ken Calvert, Division Director of Computer and Network Systems, to provide an NSF leadership perspective on Smart and Connected Communities.

KEN CALVERT: Good afternoon (or good morning, for those of you on the west coast).

I also want to say thank you for your interest, and for joining this webinar on the "Smart & Connected Communities" solicitation.

I want to take just a couple of minutes to talk about the words in the title of the program:

- "**Smart**", in this context, means something that's able to take in, process, and output information or data. More and more, our environment—and particularly the "built" environment in which we live—consists of things that are called "smart" in this sense.
- "**Connected**" refers to components and participants that share information—appropriately—across neighborhoods, systems, departments, and interest groups.
- "**Communities**" is defined specifically in the solicitation, and that will be covered later, but the points I want to emphasize are: a specific, constrained geographic extent or area, and the absence of constraints on size: big, small, and middle-sized communities are all part of this.

This program is about **integrating**, and finding synergies—ways to take advantage of these three characteristics to **improve quality of life** for the people involved. Because ultimately this, like everything NSF does, is about **people**. I think this is a rich area for research, with a wide range of multi-disciplinary problems that are both interesting and challenging, as witnessed by the five directorates involved in NSF's Smart and Connected Community program, including this solicitation, and the leadership across those directorates.

Thanks again for your interest today. Now I'll turn it back over to David and the rest of the team to present the context and go over the details of the solicitation.

DAVID CORMAN: Thank you, Ken.

Slide 2: Smart and Connected Communities (S&CC): Welcome

On the webinar today, I also have with me, Dr. David Mendonca, a Program Director for the Civil, Mechanical & Manufacturing Innovation Division, in the Engineering Directorate; and Dr. Sunil Narumalani, a Program Director for Behavioral & Cognitive Sciences, in the Social, Behavioral & Economic Sciences Directorate at NSF. Both David and Sunil will participate in the Webinar presentation as well as the Q&A session.

To begin, I'll provide context on the NSF's Smart and Connected Communities vision for the 21st Century. We'll then transition to the S&CC solicitation, NSF 16-610, which is requesting proposals for Integrative Research Grants, Research Coordination Networks, and Planning Grants. We'll talk more about the scope and requirements for the S&CC Solicitation. Finally, we will end with the Q&A session.

Slide 3: S&CC: A Vision for the 21st Century

The National Science Foundation (NSF) is a leader in advancing fundamental science research, innovation, and education that will revolutionize cities and communities of the future.

The NSF-wide investment in S&CC aligns with the National Smart Cities Initiative announced in September 2015 and includes participation from the NSF Directorates for Computer and Information Science and Engineering (CISE), Education and Human Resources (EHR), Engineering (ENG), Geosciences (GEO), and Social, Behavioral, and Economic Sciences (SBE).

Just last month, to mark the one-year anniversary of the Smart Cities Initiative, a number of public and private partners announced a new set of commitments in support of smart cities. As part of these announcements, NSF committed more than \$60 million in new investments in FY 2016 and planned investments in FY 2017, including in the S&CC solicitation.

Just to highlight a couple examples of the kinds of research activities that NSF supported:

We announced grants and planned funding to evolve the future of urban transportation, supporting researchers in Chattanooga, TN to test, for the first time, how an entire urban network of connected and autonomous vehicles can automatically cooperate to improve travel efficiency and operate safely during severe weather events.

Additionally, with funding from NSF and Argonne National Laboratory, the City of Chicago and the University of Chicago have installed a “fitness tracker for the city,” where they are anticipating 500 outdoor sensor boxes called the “Array of Things” that will allow the city and public to instantly obtain block-by-block data on air quality, noise levels, and traffic.

NSF is also working with other agencies across the federal government interested in S&CC, along with private and international partners.

NSF’s investments in the Smart Cities Initiative aligns with its leadership of the Advanced Wireless Research Initiative, which was announced back in July. As part of that effort, NSF is committing \$400 million over the next 7 years in support of fundamental research on advanced wireless technologies. Included in that number is \$50 million from NSF toward the design, development, deployment, and initial operations of 4 new city-scale wireless research platforms as part of the Platforms for Advanced Wireless Research (PAWR) program; that amount will be matched by another \$50 million from more than 20 companies that have joined forces in an Advanced Wireless Industry Consortium.

Slide 4: S&CC Overview

Cities and communities in the U.S. and around the world are entering a new era of transformational change, in which their inhabitants and the surrounding built and natural environments are increasingly connected by smart technologies, leading to new opportunities for innovation, improved services, and enhanced quality of life.

The goal of this Smart & Connected Communities (S&CC) solicitation is to support strongly interdisciplinary, integrative research and research capacity-building activities that will improve understanding of smart and connected communities and lead to discoveries that enable sustainable change to enhance community functioning.

Generally, smart and connected communities are those that integrate people and information, communication, engineering and other technologies to improve the quality of life for those who live, travel, and work in them.

Successful S&CC projects are expected to pursue integrative research and research capacity-building activities that integrate multiple disciplinary perspectives and undertake meaningful community engagement.

Emphasize multidisciplinary and meaningful community engagement.

Slide 5: S&CC Overview

Meaningful community engagement will help frame the research directions, provide access to input for such research, and provide means of understanding the results that emerge from such research efforts.

Unless stated otherwise, for the purposes of this year's solicitation, communities are physical, geographically-defined entities, such as towns, cities, or incorporated rural areas, often consisting of diverse, and varied populations, with a governance structure and the ability to engage in meaningful ways with the proposed research.

To meet the multidisciplinary criterion, proposals must meaningfully integrate across both social and technological research dimensions.

In this solicitation, the social dimensions reflect areas typically included in the portfolios of the NSF's Directorates for Social, Behavior, and Economic Sciences (SBE) and Education and Human Resources (EHR), while the technological dimensions reflect disciplinary areas typically included in the portfolios of the Directorates for Computer and Information Science and Engineering (CISE) and Engineering (ENG). Proposals may also pursue integration with other disciplines as needed, including but not limited to those typically encompassed in the portfolio of the NSF's Directorate for Geosciences (GEO). Successful proposals are also expected to include appropriate community engagement as defined further in the solicitation.

Slide 6: S&CC Component: Integrative Research

The S&CC Program consists of Integrative research, Research Capacity Building, and Community Engagement components. The Integrative Research component encompasses innovation that addresses combined social and technological aspects of smart and connected communities.

Among the social considerations that could result from pursuing an “integrative research” approach are improved understanding of the attitudes, behaviors, and other characteristics of community inhabitants, groups and organizations within the community, and relationships with other communities or the larger environment and institutions; processes of learning, adaptation, interaction, and collaboration; economic impacts on the community; and future opportunities for growth.

Among the technological considerations that could result from taking an “integrative research” approach are things such as: data integration and management; new algorithms and modeling frameworks for understanding and exploiting high volumes of diverse and complex data; security and privacy; and innovations in the design and engineering of materials, sensors, structures, and systems in support of smart and connected communities, and improving quality of life therein.

From an integrative perspective, these considerations must be explored in concert, taking into account opportunities, vulnerabilities, and possible unintended consequences of distributed, intelligent technologies embedded within communities. Examples of illustrative integrative research topics are provided in the S&CC solicitation. These include things such as:

- Infrastructure retrofit and design through advances in systems science and engineering, and in light of broader social changes in the attitudes, behaviors, and demographics of the community;
- Novel computing technologies, and advances in theories of learning, that enable cyber-learning with consideration of distributed intelligence, knowledge-building communities, formal or informal educational environments, knowledge management, and communities of practice for a future diverse and innovative workforce; and
- Fundamental research in sensing/estimation and information-theory, cooperative control, game theory applied to and influenced by smart and connected communities and their members.

Slide 7: S&CC Component: Research Capacity-Building

Now lets talk about the S&CC Component: Research Capacity Building. The Research Capacity-Building component refers to activities that further develop the interdisciplinary teams and team members that can contribute to research and applications for smart and connected communities, whether by developing plans for future research efforts and directions or in the activation of collaborations or networks to link new and ongoing efforts in novel ways. The ultimate goal of research capacity-building is to develop and attract research talent to address S&CC integrative research challenges through training, collaborations, networks, seminars, or other approaches. Such activities should be organized around strongly multidisciplinary, integrative theme(s) such as those described in the S&CC Solicitation, and with close community engagement.

Slide 8: S&CC Component: Community Engagement

The Community Engagement component is an essential component of both integrative research and research capacity-building. Here, community engagement refers to substantive interaction with individuals, institutions, and other organizations in target communities as defined above. Examples of community partner organizations and anchor institutions in the public, private and not-for profit sectors include but are not limited to governments, government departments, schools, libraries, health and social service providers, non-profits, cultural organizations, and businesses. Investigators and community partners are encouraged to work closely to develop and evaluate creative approaches to achieving meaningful engagement for mutual benefit. Examples of community engagement are provided in the S&CC Solicitation.

Now, I'm going to turn it over to David Mendonca to walk you through the details of S&CC Proposal Categories.

DAVID MENDONCA:

Slide 9: S&CC Proposal Category: Integrative Research Grants Track 1 & Track 2

Thank you, David.

This solicitation will support research projects in four categories: Integrative Research Grants (IRG) Track 1, and Track 2, Research Coordination Networks, and Planning Grants.

The ultimate goal of Integrative Research Grants is to develop integrative research understanding in aspects of S&CC meaningful to communities, and by example point the broader research community toward S&CC research frontiers. All proposals in this category require a preliminary proposal.

While projects may focus on advances across multiple application domains, all proposals should take a holistic and integrative approach to addressing research problems central to understanding, adapting to, and developing S&CC systems, both from social and technological perspectives. IRG projects must also describe activities directed at building research capacity, namely activities to develop or attract research talent to address S&CC integrative research challenges. IRG projects are expected to involve and demonstrate substantive community engagement

It is anticipated that IRG Tracks 1 awards will provide three to five years of support for projects at a level not to exceed \$5,000,000 for the total budget; and IRG Tracks 2 awards will provide three or four years of support for projects at a level not to exceed \$1,000,000 for the total budget.

Slide 10: S&CC Proposal Category: Research Coordination Networks

The ultimate goal of Research Coordination Networks (RCN) awards is to nurture and grow the S&CC research and education ecosystem, including cultivating new research directions in this area and/or otherwise advancing the field through communication and sharing of ideas. Proposals in this category do NOT require a preliminary proposal.

RCN awards are intended to significantly advance the S&CC field or create new directions in research by supporting groups of investigators in communicating and coordinating their research, training, and educational activities across disciplinary, organizational, and geographical boundaries.

The activities supported by S&CC RCN awards are the means by which investigators foster synthesis and new collaborations, and communicate and share information and ideas, including advances in science, engineering, and education.

S&CC RCN awards are not meant to support existing activities of established collaborations. Areas of interest may include but are not limited to novel participant networking strategies, collaborative technologies for interdisciplinary or distributed work, and research community standards for data and meta-data.

Each of these awards will provide four to five years of support for projects at a level not to exceed \$500,000 for the total budget.

More information about the RCN concept and mechanism can be found in NSF publicaiton [NSF 15-527](#).

Slide 11: S&CC Proposal Category: Planning Grants

The ultimate goal of S&CC Planning Grants is to stimulate and enable a future high-impact project that can contribute to the S&CC vision. Proposals in this category do NOT require a preliminary proposal.

S&CC Planning Grants are intended to build multidisciplinary research teams that will engage community stakeholders to develop a holistically integrated, fundamental S&CC research concept. Planning grants must address how local community engagement will inform the planning activities. They are not meant to support research on the proposed concepts.

Proposals must present a description of the fundamental, integrative research concept along with a strategy for developing this concept. Examples of these strategies include but is not limited to identifying academic collaborators, building partnerships with appropriate community stakeholders, planning regular interactions with the team or cross-training of students, and exploring the unique needs of the community.

Each of these awards will be at a level not to exceed \$100,000 for the total budget and a duration of 1 year.

Research concepts must align with the definition of Integrative Research outlined in the Program Description for the S&CC Solicitation, NSF 16-610.

Now, I'm going to turn it over to Sunil Narumalani to walk you through the details of S&CC Award and Eligibility Information and Preparation Instructions.

SUNIL NARUMALANI:

Slide 12: S&CC Award Information

The number of awards in each category will be dependent on the overall mix of proposals and the degree to which they meet the solicitation goals, Merit Review Criteria and Solicitation Specific Review Criteria.

NSF anticipates investments up to \$18.5 million to support approximately one to three Integrative Research Grants Track 1 awards, five to eight Integrative Research Grants Track 2 awards, two to three Research Coordination Networks (RCN) awards, and 10 to 15 Planning Grants.

Note that awards and future commitments are dependent on the availability of funds.

Slide 13: S&CC Eligibility Information

As specified in the solicitation, an individual may appear as a PI, Co-PI, or other Senior Personnel on only one proposal submitted to either S&CC Integrative Research Grants Track 1 or Track 2 (BUT not both), only two proposals submitted to the S&CC Research Coordination Networks category, and only one proposal submitted to S&CC Planning Grant category.

There are no restrictions or limits to who may serve as PI or to the number of proposals per organization.

For collaborative proposals involving multiple institutions, the proposal must be submitted by one lead institution with funding for all other participating institutions made through subawards.

For U.S. universities and two- and four-year colleges with overseas campuses, this solicitation restricts eligibility to research activities using the facilities, equipment, and other resources of the campus(es) located in the U.S. only.

Please see the NSF *Proposal & Award Policies & Procedures Guide* (PAPPG; [NSF 16-1](#)) for additional information and to make sure you meet all eligibility requirements.

Slide 14: S&CC Proposal Preparation Instructions: Preliminary Proposals

As mentioned previously, submission of a Preliminary Proposal is required in order to be eligible to submit a Full S&CC Integrative Research Grant Proposal, Track 1 or 2. Preliminary proposals must be submitted via the NSF FastLane system, even if full proposals will be submitted via Grants.gov and page limitations will be strictly enforced. Proposers should review the most current NSF PAPPG (NSF 16-1) for specific information on signatures and format requirements for the required sections.

Preliminary proposals should consist of four elements as follows and no other sections are permitted:

- First, The Cover Sheet must contain The Project Title, and begin with "S&CC-IRG Preliminary Proposal Track (1 or 2)", followed by a colon, and followed by the project title.
- Second, The Project Summary may not exceed one page in length and must consist of the following three clearly labeled sections: Overview, Intellectual Merit, and Broader Impacts.
- Third, The Project Description of the preliminary proposal is limited to four pages and must consist of the following six clearly labeled sections: Vision and Goals, Integrative Research Approach, Research Capacity-Building, Integration and Multi-Disciplinary Context, Management, and Budget and Subawardees.
- Fourth, the Project Personnel and Partner Institutions is limited to one page and must provide current, accurate information for all personnel and institutions involved in the project.

Slide 15: S&CC Proposal Preparation Instructions: Full Proposal

Proposers must follow the most current version of *NSF PAPPG* for guidance on the required sections of a full research proposal submitted to NSF.

It is important to note that the 2017 PAPPG has not yet been released. NSF anticipates release of the revised PAPPG in the Fall of 2016, which will be effective for proposals submitted, or due, on or after January 30, 2017. The Full Proposal deadline is February 16th and therefore ALL Full Proposals will fall under the revised PAPPG.

Proposers of Full Proposals have the option to submit in response to the S&CC Program Solicitation via Grants.gov or via the NSF FastLane system.

Slide 16: S&CC Proposal Preparation Instruction – Full Proposal

The Full Proposal has requirements that are specific to the program category you are applying for. It is the responsibility of the proposer to assure submitted proposals meet all requirements detailed within the Smart & Connected Communities solicitation (NSF 16-610). Full proposals require a Cover Page, Project Description, Collaborators and Other Affiliations Information, and Supplemental Documents.

The Cover Sheet must contain the Project Title with a prefix that is specific to the program category you are applying for. The prefix for each program area is provided in the S&CC solicitation.

The Project Description for S&CC Integrative Research Grants Tracks 1 and 2 and S&CC Research Coordination Networks is limited to 15 pages, whereas the S&CC Planning Grants are limited to 5 pages.

A Collaborators and Other Affiliations Information template can be found at <https://www.nsf.gov/cise/collab/>.

Supplementary Documents include a Project Personnel and Partner Institutions document for all award categories, an Integration and Management Plan for Integrative Research Grants Tracks 1 and 2 ONLY, and Letters of Collaboration and Human Subjects Protection document based on the specifications of the solicitation.

Now, I'm going to turn it over to David Corman to walk you through the S&CC due dates, Program Director contact information, and to provide a review of the key solicitation requirements.

DAVID CORMAN:

Slide 17: S&CC Due Dates

Once again, here are important reminders about the S&CC solicitation

The Preliminary Proposal Due Date is November 30, 2016, and

The Full Proposal Deadline is February 16, 2017.

As with all solicitations, proposals are due by 5:00 pm submitter's local time.

Slide 18: S&CC Program Contacts

Here, we have provided a list of the program directors that represent each of the NSF Directorates participating in the S&CC Solicitation. You may use this list to target the appropriate point of contact within each Directorate. Please note that the following information is current at the time of publishing. See the program website for any updates to the points of contact.

Slide 19: S&CC at a Glance

Thank you for joining us today for the Smart & Connected Communities Webinar. Please check the NSF S&CC webpage at nsf.gov/scc for more information about NSF's S&CC activities. Please consider serving on a S&CC review panel and/or recommending individuals to serve on S&CC panels. Your participation in the review process is critical to NSF.

S&CC: At a Glance

- Goal: To pursue research and research capacity-building activities that integrate multiple disciplinary perspectives and undertake meaningful community engagement
- Components: Integrative Research, Research Capacity-Building, Community Engagement (for all tracks; the level of each depends upon the track)
- Limit on PI Submissions: yes, see solicitation for details
- Total funding: \$18.5M across 18-29 awards, subject to the availability of funds
- Participating directorates: CISE, ENG, SBE, EHR, GEO
- Read the solicitation carefully ([NSF 16-610](#)) and visit www.nsf.gov/scc for more info about NSF's investments
- Contact SCCquestions@nsf.gov with additional questions

(Review Table)

Slide 20: Key Takeaways:

1. This solicitation supports use-inspired **fundamental research**.
2. A critical requirement and distinguishing feature of this solicitation is **community engagement** – see solicitation for details.
3. Who may **submit**:
 - Universities and Colleges, non-profits, for-profit organizations, state and local governments, etc. in compliance with NSF *PAPPG*;
 - U.S. institutions may propose collaborative work with partners in foreign countries;
 - The number of proposals per PI or Co-PI is limited.
4. Multi-institution proposals must be submitted by **one lead institution using subawards** for funding all other participating institutions.
5. **Read the solicitation carefully.**

I will now turn it back over to Sunil Narumalani to provide you with several frequently asked questions and answers.

SUNIL NARUMALANI:

Slide 21: S&CC FAQ

Formal FAQ will be posted on the S&CC solicitation website in late October, early November.

Questions answered today are informal and serve to clarify. The solicitation is the official word. The formal FAQ is an advisory document, and is not binding.

How is a “community” defined and how many communities are required for partnership?

For the purpose of this solicitation, communities are physical, geographically-defined entities, such as towns, cities, or incorporated rural areas, often consisting of various populations, with a governance structure and an ability to engage in meaningful ways with the proposed research.

Proposers must define the community and reflect how the community will engage in meaningful ways with the proposed activities.

Participation of at least one community is required. It is expected that this participation will be undertaken through collaboration with one or more community partners.

Slide 22: S&CC FAQ

What is a community partner, and who might be a community partner for my research?

Community partners are those collaborators who are directly linked to the community.

As described in the solicitation, examples of community partner organizations and anchor institutions include but are not limited to governments including government departments, schools, libraries, health and social service providers, non-profits, cultural organizations, and businesses.

Slide 23: S&CC FAQ

When must a letter of collaboration be included in the proposal?

Please see [PAPPG](#) Chapter II.C.2.d(iv) [NSF 16-1](#) for information regarding letters of collaboration from unfunded collaborators. A letter of collaboration, for example, may be used to demonstrate community engagement from unfunded partners. In addition, that engagement should be detailed in the proposal as outlined in the solicitation.

Slide 24: FAQ

How is the S&CC solicitation distinguished from other solicitations?

A central distinguishing feature of the S&CC solicitation is the requirement to incorporate community engagement and integrative research, whereas these elements are not required (although may be present) in several other programs [e.g., [Cyber-Physical Systems \(CPS\)](#), [Critical Resilient Interdependent Infrastructure Systems \(CRISP\)](#), [Secure and Trustworthy Cyberspace \(SaTC\)](#), [Innovations at the Nexus of Food, Energy, and Water Systems \(INFEWS\)](#), [Cyber-Human Systems \(CHS\)](#), and other NSF core programs].

Slide 25: FAQ

Is a preliminary proposal required?

| Award Category | Preliminary Proposal Required/Deadline | Proposal Deadline |
|--|--|-------------------|
| Integrative Research Grants Track 1: 3-5 yrs; up to \$5M | Yes; 11/30/2016 | 2/16/17 |
| Integrative Research Grants Track 2: 3-4 yrs; up to \$1M | Yes; 11/30/2016 | 2/16/17 |
| Research Coordination Network: up to 5 yrs; up to \$500k | No; n/a | 2/16/17 |
| Planning Grants: 1 year; up to \$100k | No; n/a | 2/16/17 |

Can an IRG full proposal be submitted if a preliminary proposal is not submitted?

No. A full proposal can only be submitted if a preliminary proposal is received by the deadline specified in the solicitation (November 30, 2016).

I will now turn it back to David Corman who will moderate Q&A from the audience.

DAVID CORMAN:

(Questions)