

COUNCIL ACTION FORM

SUBJECT: AMESNET ADVANCED WIRELESS RESEARCH PROPOSAL

BACKGROUND:

Iowa State University is preparing a proposal entitled “AmesNet: Wireless Living Lab for Real-Time Cyber-Physical-Human Systems” for submittal to the national Platforms for Advanced Wireless Research (PAWR) program (<https://www.advancedwireless.org/>). It is believed this program is, globally, the first of its kind. A one-page overview of the proposal is enclosed. The envisioned network will enable trustworthy, ultra-high reliability, and ultra-low latency (TURL) wireless communication to provide transformative applications in various domains such as public safety, transportation, power grid, municipal services, agriculture, and manufacturing.

The PAWR program is intended for university-city-industry proposals and includes \$100,000,000 to award between four projects; two in 2018 and one each subsequent year. The program is sponsored by the National Science Foundation (NSF) and funded equally between NSF and a group of industry partners.

AmesNet would provide a wireless network platform across ISU, Ames, Nevada, and a portion of Des Moines. **It must be emphasized that this network is not intended as an internet service provider for individual customers, but rather to provide a platform for a “living lab” for wireless research related to municipal services.** Potential city-service related research could include projects such as:

- Communication for traffic adaptive signal corridors
- Snow and ice control monitoring and planning for routes and conditions
- Mobile data and communication for public safety
- Continuous data gathering by CyRide and police
- Electric service and usage monitoring
- At-home tele-medicine monitoring and treatment applications

The proposal does not require any financial commitment from the City for the development and deployment of the network. In fact, the proposal requirements prohibit providing any funds. However, the City is being asked to allow the network infrastructure in the right-of-way and cooperate in finding appropriate locations for transmission equipment on electric poles, street lights and traffic signals.

The first five years of installation, development, deployment, operation and management would be entirely funded by the NSF grant. Following that period, the City is being asked to provide representation on an AmesNet Consortium controlling board and on operational working groups. The City would also provide advice to the

Consortium on developing strategies for the long-term viability for the AmesNet system. Additionally, a portion of the bandwidth of the network would be dedicated to the City as a living lab for providing municipal services.

The proposal submission is due by July 31, 2017. As part of the submittal, a support letter from the City has been requested and is attached. A small group of proposals will be selected as finalists by October 2017. NSF will then conduct site visits of those locations by the end of 2017. The winning projects will be announced during the early part of 2018.

ALTERNATIVES:

1. The City Council can decide to authorize the Mayor to submit the attached letter of support and commit to the five points outlined in the letter.
2. The City Council can decide to decline City to support the proposal and not participate in any research associated with the “living lab.”

MANAGER’S RECOMMENDED ACTION:

The AmesNet proposal is an exciting opportunity for the City, ISU, and the region. It provides a platform for cutting edge research and applications in many different domains such as public safety, transportation, power grid, municipal services, agriculture, and manufacturing. Specifically, as a local government, it provides opportunities to test and refine innovative approaches to city services utilizing wireless applications. It also provides the potential to engage in on-going demonstration projects on this innovative platform.

Therefore, it is the recommendation of the City Manager that the City Council adopt Alternative No. 1, as noted above.

As pioneer Internet entrepreneur Steve Case argued in his 2016 New York Times bestselling book “The Third Wave”, we are entering the era of Internet of Everything, and the innovation ecosystem is expected to become distributed and embedded into centers of excellence in industries such as public safety, agriculture, transportation, power grid, and manufacturing. Being a leader in the aforementioned industries, with Iowa State University (ISU) leading cutting-edge research in Internet of Things (IoT), and with a strong in-state financial industry, the State of Iowa and the greater Des Moines and Ames region have a strong potential to become a leader in the third wave of Internet evolution, i.e., the era of Internet of Everything. In this context, one exciting opportunity is the *Platform for Advanced Wireless Research (PAWR) program*¹ of the National Science Foundation, which intends to invest \$100 million to four university-city-industry partnerships to create at-scale infrastructures of next-generation wireless networking technologies and applications.

Towards establishing Iowa as a leader in the third wave of Internet evolution and addressing grand technological and societal challenges, we propose to establish *AmesNet*, a large-scale wireless networking infrastructure spanning the greater Des Moines, Ames, and Nevada region as shown in Figure 1. In addition to supporting research and education in wireless networking, AmesNet is expected to enable transformative applications in domains such as mixed-reality (MR), public safety, agriculture, transportation, power grid, and manufacturing. Therefore, AmesNet is expected to contribute to the innovation ecosystem and economy of the greater Des Moines, Ames, and Nevada region and the State of Iowa.

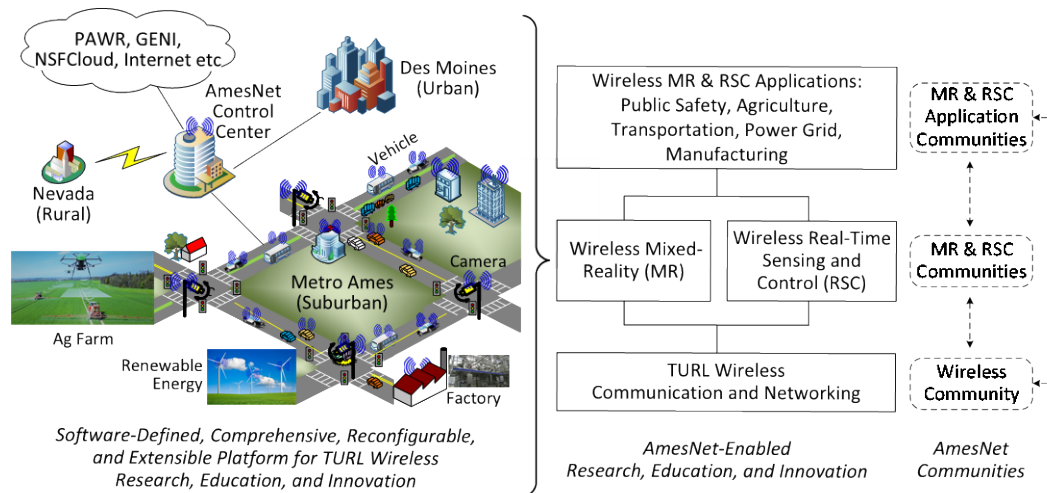


Figure 1: AmesNet Vision

(note: TURL Wireless stands for “trustworthy, ultra-high reliability, and ultra-low latency wireless”)

Example benefits of the AmesNet project include but are not limited to the following:

- IP and first-to-market advantages for companies pioneering mixed-reality (MR) and real-time-sensing-and-control (RSC) systems in public safety, agriculture, transportation, power grid, and manufacturing
- Millions of dollars of direct investment in the economy of the Des Moines, Ames, and Nevada region
- Recurring economic benefits from attached industry- and government-funded IoT research on AmesNet
- Potential for new job creation as AmesNet attracts “impact investment” funding for IoT startups and as AmesNet attracts wireless companies to locate or maintain a base of operations around the Des Moines, Ames, and Nevada region
- Opportunity to test and refine innovative approaches to city and community services utilizing wireless applications
- National visibility as a leader in wireless innovation and in the third wave of Internet evolution in general

AmesNet Contact:

Hongwei Zhang, Associate Professor of Electrical and Computer Engineering, Iowa State University
 hongwei@iastate.edu, (614)286-3246, <http://www.cs.wayne.edu/~hzhang/>

¹ NSF PAWR program: <https://www.advancedwireless.org/>



July 26, 2017

PAWR Project Office (PPO)
NSF Platforms for Advanced Wireless Research Program

RE: AmesNet: Wireless Living Lab for Real-Time Cyber-Physical-Human Systems

Dear Colleagues of the PPO and Proposal Review Panel:

The City of Ames is pleased to support the enclosed proposal to establish the advanced wireless network living lab, AmesNet. The City of Ames, Iowa, located in Story County, is a progressive, urban community situated between denser urban/suburban populations (e.g., Des Moines, Iowa, metro area) and rural communities and small towns (e.g., Nevada, Iowa).

Ames is the home of the Iowa State University of Science and Technology; a regional office of the Federal Highway Administration; the National Animal Disease Center of the USDA; the Department of Energy's Ames National Lab and Critical Materials Institute; the State of Iowa's Department of Transportation; a large, regional, city-owned hospital; and a regional, physician-owned, multi-specialty clinic. Furthermore, we have a rich history of successful partnerships among these various governmental entities within our community which will assure the ongoing success of the AmesNet.

What is particularly exciting to the City of Ames is the opportunity to apply the findings from the research developed in the living lab to ongoing demonstration projects related to our city services. In this way, the City of Ames can show to the world how the research findings can be practically implemented by governmental organizations to improve services to their citizens.

If the AmesNet proposal is selected for funding, the City of Ames is committed to:

- Cooperate with ISU and the other governmental agencies involved to form an administrative board (Consortium) and to develop a framework for the deployment, operation, and management of the AmesNet network. This includes providing active representation to the AmesNet Consortium and working groups;
- Make various city departments (e.g., Police, Public Works, Electric Services, Finance/IT) available to advise the AmesNet team regarding the design and execution of applied research derived from AmesNet that is consistent with City Council goals (i.e., innovative applications in public safety, transportation, and non-critical power services);

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- Make available city right-of-way and infrastructure, such as power supply, poles, street lights, and traffic signals to deploy and operate the AmesNet infrastructure;
- Expedite any city permitting processes necessary for the AmesNet infrastructure;
- Work with the AmesNet to facilitate community stakeholder involvement in projects: for instance, public safety, smart agriculture, smart transportation, smart grid, and advanced manufacturing; and,
- Assist the AmesNet Consortium in its attempt to develop strategies for the long-term viability of the AmesNet living lab after the five-year NSF funding period.

Good luck with your selection process, and thank you very much for considering the AmesNet proposal.

Sincerely,

A handwritten signature in cursive script that reads "Ann H. Campbell". The signature is written in dark ink and is positioned above the typed name.

Ann H. Campbell, Mayor
City of Ames, Iowa