

## Califa Group

### **SecondNets: Libraries Using TV Whitespace to Develop Disaster Communications Kits for Second Responders**

**Proposal Overview:** “2017 [was] the most costly U.S. disaster year on record”, reports the Washington Post. Climate change predicts extreme weather-related disaster events will increase both in severity and frequency. “[T]he provision of access to computers and the Internet was a wholly unique and immeasurably important role for public libraries. This infrastructure can be a tremendous asset in times of emergencies, and should be incorporated into community plans.” University of Maryland / Florida State University findings

Califa Group’s SecondNet project seeks \$247,000 to provide sub awards for existing and new projects to develop resilience capabilities by prototyping **SecondNet Kits** that 1) establish direct links, via TV Whitespace (TVWS), between libraries and other anchors as second responders; 2) include portable remote access stations with library WiFi, backup power, charging and other features important to disaster response; 3) work with equipment vendors to develop an off-the-grid capability to run as autonomous communications networks even without the Internet; and 4) create a national standard of systems requirements to optimize disaster response capability. These kits will integrate off-the-shelf technologies, including but not limited to: TVWS/WiFi networks, backup power sources like solar, remote kiosk access points with charging capability and embedded interface (e.g. tablet) and optimized for portability and extended operation in lights out/Internet out scenarios.

TVWS is extremely valuable license-exempt radio spectrum, located in TV bands, which the Federal Communications Commission (FCC) recently made available for open, shared public use like traditional WiFi. TVWS is unique in that it does not require line-of-sight to support signals. Frequencies associated with TVWS reside in the lower radio frequency bands. Signals can travel for several miles and oftentimes pass through geographic and community obstructions such as trees or buildings.

Current library whitespace projects in ME, GA, NE, SD & WA were funded by a prior IMLS grant to use TVWS equipment with WiFi to expand access to library digital services in new public spaces: **Libraries Leading in Digital Inclusion and Disaster Response via TV WhiteSpace Wireless Connections**. Added support from state library agencies in MI & PA and a Microsoft contribution enabled an additional 4 local library projects, making a total of 9 library TVWS/WiFi projects in 7 states. Each project is encouraged to collaborate with other anchor institutions and to incorporate disaster planning into their proposals. These projects will serve as a valuable distributed, standardized testbed for development of SecondNet Kits.

**Background and Need:** When disaster strikes, the commercial communications infrastructure is typically impacted for days or even weeks. “The reality is that after a catastrophic event, the public communications infrastructure WILL be down for 2 – 10 days on average, and the community will need temporary connectivity until the public utilities are restored. Libraries and other anchor institutions can help bridge that information and communications gap by using TVWS and traditional WiFi together,” says Joe Hillis of the Information Technology Disaster Resource Center.

Every community needs a simple, inexpensive, redundant and reliable wide area wireless communications system for libraries and other local anchor institutions, as second responders, to increase resilience and to increase participation in wider community disaster planning. We call these wireless networks **SecondNets**. SecondNets references a new nationwide federal initiative, **FirstNet** for first responders. However, the FirstNet infrastructure will be prioritized for fire, police and ambulance services while critical second responders like libraries, schools and clinics must cope using general infrastructure which will be overloaded or unavailable in disasters. Community scale SecondNets are intended to supplement the FirstNet as a redundant local resource to support wider community ICT needs in response to large scale events.

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This project aligns with new ALA guidelines for pending IMLS/LSTA appropriations including a priority for “explicit allowance for grant funds to be used to help libraries prepare for and provide services after a disaster or emergency”. The project will also conduct preliminary research on library experiences in the recent and costly hurricane, fire and other disasters. This information will guide development and prioritize use needs. A new self-guided crisis response course will be created, building on a “TVWS basics” course created under the prior grant. The project will facilitate formation of a new Consortium of national organizations to advise on functionality and system requirements for SecondNets as robust dual-use wireless communications “kits” for libraries to use for their own needs and in partnership with other community anchors.

**Team:** The SecondNet Consortium includes: Gigabit Libraries Network (GLN), the School, Health, & Libraries Broadband Coalition (SHLB), Chief Officers of State Libraries Association (COSLA), the Quilt (association of R&E Networks), Information Technology Disaster Resource Center and others. Additional roles are being played by Professor Sharon Strover of University of Texas in updating research and Kristen Rebmann of San Jose State University in development of new self-guided course specific to disaster response. Merit Networks leading kiosk prototyping. Library of Michigan creating and publishing “how-to cookbook” of best practices. Don Means, Director, GLN serving as co-Director and PI. Paula McKinnon, Interim Director, Califa acting as grant administrator and co-PI.

**National and Professional Impact - Project Goals:** 1) Elevate libraries as critical team members in comprehensive community disaster planning; 2) create a national Consortium to define and develop system specifications to develop standardized, lower-cost SecondNet Kits; 3) demonstrate library capability to participate, on a national scale, in development of advanced technologies; 4) acceptance of SecondNet Consortium standards for incorporation by equipment vendors.

**Proposed Work Plan:** This two-year project proposes libraries leading local development of a new redundant distributed local wireless resource to increase community resilience to disaster while also expanding daily access to library digital services in new public locations. **Phase I:** Compile existing research on library disaster roles adding recent library experiences and disaster responses to inform “Kit” system design process and to support development of a new self-guided course “Libraries using TV Whitespace in Disaster Response” led by SJSU. **Phase II:** Development. The Project envisions new sub awards to support new and existing **Whitespace Libraries** to act as a distributed development team in prototyping SecondNet Kits. Libraries, using TVWS, will partner with leading equipment vendors to create new more resilient systems that can operate autonomously during emergencies, even without Internet, as ad hoc IP networks capable of running standard IP applications like maps, VOIP, messaging as resident apps. **Phase III:** Findings and Courseware. All sub-award funded projects will be assessed and rated for creativity, resilience, daily use benefits and cost effectiveness with results published in the “how-to cookbook”. The Consortium will use these findings to update and renew SecondNet Kits capabilities.

### Budget:

Director, Co-PI, wages, consulting and salaries:	\$ 95,000
Technology Sub-awards: 4-6	\$105,000
Grant Admin Indirect, Califa	\$ 9,000
Course Development	\$ 20,000
Site visits -Travel	\$ 8,000
Research Update	<u>\$ 10,000</u>
Total request:	<u>\$ 247,000</u>