The National Science Foundation is funding this work in part under Cooperative Agreement 2044448

PROJECT OVERCOME

$1.945M (NSF) and $450,000 (Schmidt Futures)

to accelerate delivery of broadband services to unserved/underserved

www.us-ignite.org/program/overcome

usignite

usignite

- Public-private partnership
- 501(c)(3)
- Launched at White House in 2012 (with strong NSF support)

Our Mission

Accelerate the creation of innovative apps and services that leverage advanced networking to build the foundation for smart communities

Observations

- Need for rural solutions where fiber investment is cost-prohibitive
- Need for investment in dense urban public housing
- Community-driven muni-wireless and wired gaining in popularity
- Youth workforce training efforts to support adoption and tech transfer
- Neutral Host or Open Access efforts reduce costs, but ecosystem management is new
- Municipally-enabled leverage existing infrastructure
- Federal lifeline services are not meeting needs
- Tradeoffs between urgent needs for solutions and longer-term benefits

Project Timeline:
Spring 2021 – Spring 2022

Deliver proofs-of-concept for network connectivity and use learning to help inform national broadband strategy for connectivity and adoption

Build professional community of practice across academic, municipal and infrastructure partners

Document and create playbooks

usignite

	Westchester County Association	Digital C	Libraries without Borders	Missouri University of Science & Technology	University of Buffalo	Allied Media	Onward Eugene
Location	Yonkers NY	Cleveland OH	Loiza Puerto Rico	Clinton County MO	Buffalo NY	Detroit MI	Blue River OR
Technology	CBRS	mmWave	Hot spots	RFoF links to fiber	CBRS	Fiber & fixed wireless	Fiber/CBRS/ hotspots
Setting	Urban	Urban	Urban	Rural	Urban	Urban	Rural
Impact	250 households	225 households	3 Community Centers	28 households	36 households	5 households	95 hotspots
Deployment Partners	Y-PIE Youth	Community partners	Promotoras	Volunteers	Digital Stewards	Digital Stewards	Community partners

Building Internet Resilience from the Ashes of the Holiday Farm Fire

Blue River, Oregon

- Principal Investigator: Onward Eugene
- Innovative use of microwave backhaul and Citizen Broadband Radio Service (CBRS) in post-forest fire tree-laden area.
- **95 hotspots | Rural**
- The pilot is a testing ground for P3 and **disaster mitigation strategies** with regards to internet connection could prove invaluable in future scenarios.
- Current Challenge: Cost escalations, acquiring unlocked CBRS Hotspots

usignite

CBRS Deployment in the Fruit Belt Neighborhood

Buffalo, NY

- Principal Investigator: University of Buffalo
- Testing the new idea of building out a indoor mounted, outdoor CPE, CBRS-based wireless broadband network led by **local Digital Stewards.**
- **100 households | Urban**
- The pilot aims to evaluate the achievable network performance, and co-create social impact and long-term sustainability with the community.
- Current Challenge: Propagation ≠ Adoption

usignite

Project Empower-Cleveland's Innovative Approach to Bridge the Digital Divide

Cleveland, Ohio

- Principal Investigator: DigitalC
- Deploying mm wave technology leveraging Siklu nodes installed on rooftops to facilitate a mesh network for the MDU.
- **225 households | Urban**
- Provides a good replicable framework for urban communities looking to bring **a low-cost service to market and ways to affordable housing** entities for broadband usage.
- Current Challenge: Power requires reconfig

usignite

A Systems Approach to Scaling Rural Co-op Efforts to Expand the Fiber Edge

Clinton County, Missouri

- Principal Investigator: Missouri University of Science & Technology
- Deploying a wireless network using RF-over-Fiber technology
- **30 households | Rural**
- Unique network architecture: a combination of 60 GHz and unlicensed
- Unique partnership with electric utility company (United Co-op) that seeks to extend their fiber footprint via wireless
- Current Challenge: COVID slowdown

usignite

Equitable Internet Initiative Detroit

Detroit, Michigan

- Principal Investigator: Allied Media
- Providing a hybrid network of fiber, fixed wireless, and community mesh connectivity at up to 25/3 Mbps speed
- **100 households | Urban**
- The proposed network is expected to provide reliable connectivity when infrastructure fails due to severe weather conditions through Community Power Stations, solar-powered device charging with public wifi hotspots and Portable Network Kit (PNK).
- Current Challenge: Pole Access

usignite

ConnectED2Health: Expanding Broadband Access to Loíza, Puerto Rico

Loiza, Puerto Rico

- Principal Investigator: Libraries Without Borders
- This project would connect community centers with WiFi using 4G cellular hotspots.
- **90 residents| Urban**
- This project is designed to support a community that struggles with high broadband service costs, the lack of computing devices, and low digital literacy.
- Current Challenge: Power consumption

usignite

Y-Zone Project

Yonkers, New York

- Principal Investigator: The Westchester County Association, Inc.
- Offering connectivity using CBRS spectrum
- **250 households | Urban**
- Potential of creating a replicable and scalable digital ecosystem model, high-cost effectiveness, and high community outreach and engagement.
- Current Challenge: None

usignite

What Can Your Agency (and You) Do?

- Offer your expertise
  - State Broadband Office
  - Local Government in your community
  - Community Noncommercial Projects
  - Underserved anchor institutions (libraries, schools, healthcare, public safety)
  - Work as a team with all the above

usignite

Does your community have a Local Internet Exchange Point?

- Support your community network exchange point
  - Digital Town Square
  - Support it! Volunteer
  - Donate equipment and expertise
- Create one if your area doesn't already have one
  - Keeps the local community traffic local (and low latency)
  - Keeps local resources online during emergencies (upstream disrupted)
  - Reduces costs of upstream bandwidth
  - Attracts caches and edge computing
  - Reduces latency and improves bandwidth to cloud services

usignite

Do you have access to a Tall Building?

- Allow the roof to be used for mmWave point-to-point feeds to neighborhoods (Cleveland model)
- Allow the roof to be used for mesh networking feeds (e.g., NYC Mesh model)
- Provide services to nearby residential facilities (Buffalo model)

usignite

Do you own Fiber or IRUs?

- Trade lambdas for access to other delivery assets (other fiber, towers, etc.) (Utah and many other states model)

- Help expand the fiber edge – install cubes opportunistically (Urban example: Detroit; Rural example: Clinton County)
- Work with departments of transportation to bury fiber whenever roads are repaved

usignite

Do you have expertise in Wireless?

- Attn: Amateur radio enthusiasts
- Set up wireless feeds to nearby unserved or underserved homes, anchor institutions, or small businesses (Yonkers Y-Zone Project)
- CBRS GAA works fine in less populated areas; PAL licenses needed in urban areas (Arlington, Yonkers, Buffalo)
- Use 2.4 MHz WiFi for best penetration; 5 GHz Wifi and CBRS have limited penetration especially with brick buildings
- Use outdoor CPE – but power can be an issue (Cleveland)
- Permitting issues (Detroit and others)

usignite

Connectivity is not enough: Equipment

- Channel surplus computers/tablets/printers/WiFi base stations to unserved / underserved populations newly receiving connectivity
  - Universities
  - Local industry
  - Local government
  - National labs
- Ongoing issue (not just one-time)

Train the unserved in how to use the Internet

- Working from home
- Searching for new jobs
- Educating (kids, continuing education)
- Searching for health information online; telehealth
- Connecting to community (Loiza, Puerto Rico)

usignite

Build Community Internet Resilience

- Preparing emergency Internet communications capabilities for quick deployment

usignite

Publications

- **Report (Benton Institute of Broadband and Society)**
  - Project OVERCOME: Innovative Connectivity Solutions in Seven Communities
- **Playbooks**
  - Public Private Partnerships: A Case Study from Yonkers, NY
  - Community CBRS Networks What you Need To Know

usignite

"Any opinions, findings, conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the Networking and Information Technology Research and Development Program."

The Networking and Information Technology Research and Development (NITRD) Program

Mailing Address: NCO/NITRD, 2415 Eisenhower Avenue, Alexandria, VA 22314

Physical Address: 490 L'Enfant Plaza SW, Suite 8001, Washington, DC 20024, USA Tel: 202-459-9674, Fax: 202-459-9673, Email: nco@nitrd.gov, Website: https://www.nitrd.gov