



2024

US Ignite Annual Impact Report

MISSION

US Ignite collaborates with smart communities and research testbeds to drive high-impact solutions to their toughest challenges. Operating like a high-tech startup, our organization delivers timely results by applying technical expertise, stakeholder engagement, and targeted tools. US Ignite works tirelessly to ensure our programs are effective and reach the communities that need them the most.



LETTER FROM CEO NICK MAYNARD

As we stand at the crossroads of another transformative year, it is with great pride and excitement that I reflect on the remarkable journey of US Ignite throughout 2023. We encountered success across our program areas - delivering real solutions to real problems by capitalizing on the expertise provided by our partners, collaborators, and the entire US Ignite community.

2023 HIGHLIGHTS

The Smart Bases team delivered AI-driven heat and weather risk management solutions to Army partners

ARA, the 4th and final PAWR testbed was launched

Communities found new ways to leverage data and collaborate in the air quality work group

Strengthened partnership with National Spectrum Consortium (NSC) created increased support for wireless R&D

Our Smart Bases team earned the "Infrastructure App of the Year" award by Topio Networks for its Inclement Weather Decision Support Application, designed and developed for Fort Carson. Thanks to successful deployments of other infrastructure and public safety solutions at Fort Moore, the team also secured additional funding for the Smart Installation and Community Dashboard Program.

Our Platforms for Advanced Wireless Research (PAWR) Project Office launched ARA, the fourth and final research testbed. The new testbed in Central Iowa is now open for research on rural wireless systems and applications.

Our communities team deployed new broadband connectivity projects in Syracuse, NY and Greensboro, SC, and hosted events and activities to spur startup innovation in Salt Lake City, and Washington, DC. The team shared best practices through [new playbooks on challenges](#) and prize competitions and [innovation districts](#).

Our partnership with the National Spectrum Consortium (NSC) deepened to include programmatic support for the organization as it transitioned to a nonprofit facilitating high-value R&D and prototyping projects designed to solve spectrum challenges.

Two longtime US Ignite champions also reached notable achievements in 2023. Anna Gomez was confirmed as the new fifth FCC Commissioner. Her journey from our board to this influential position is a testament to our shared commitment to progress. Bob Metcalfe earned the prestigious A.M. Turing Award for his groundbreaking invention of Ethernet. We take pride in their outstanding accomplishments.

As we welcome 2024, I offer my deepest gratitude to you! Your unwavering support has been instrumental in our success. Together, let us continue pushing boundaries, fostering innovation, and making a lasting impact on the communities we serve.

Here's to another year of progress, innovation, and shared success.

The Faces of US Ignite

The US Ignite team strives for success in ambitious, smart, and connected community projects nationwide.



Hani Almasoud



Praveen Ashok



Lizzette Arias



Jonathan Beam



Kyle Compton



Aloizio Da Silva



Lee Davenport



Sayed Elham Zewari



Catherine Forrest



Ryan Guild



Erin Hill



Nancy Jemison



Daniel Kawah



Domenick Lasorsa



Arnold Liyai



Mojdeh Mahdavi, Ph.D.



Nick Maynard, Ph.D.



Glenn Ricart, Ph.D.



Ram Ramanathan



Mari Silbey



Jigyasa Sharma



Bill Wallace



Eric Werner

Our Programs

US IGNITE COMMUNITIES

We support communities by empowering leaders with resources to develop resilient strategies and engage different sectors to foster innovation for economic growth.

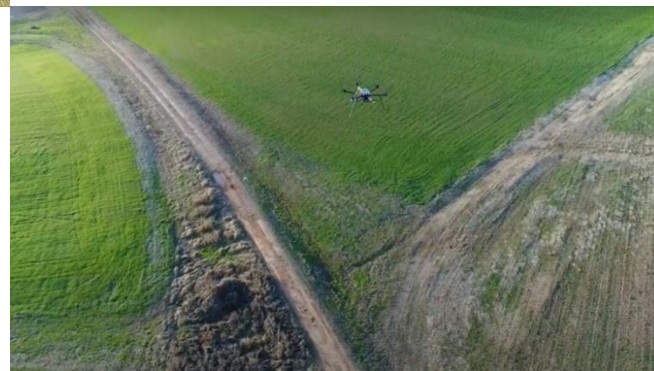


SMART BASES

We work with DoD bases and installations to develop, test, and implement smart technology solutions that meet operational research needs. These projects bring together government, academia, and private sector experts.

PLATFORMS FOR ADVANCED WIRELESS RESEARCH (PAWR)

Four platforms make up our PAWR program. The sites offer large-scale wireless testbeds in a public-private partnership that drives innovation and boosts US economic competitiveness.



CHALLENGE COMPETITIONS AND STARTUP SUPPORT

Via our challenge competitions we spark collaborations between communities and startups. We also connect startups to the larger smart city ecosystem in pursuit of new economic growth opportunities.

SMART CITIES DATA

We offer unbiased customizable support to municipal leaders so that they can leverage and capitalize on their datasets. Our data experts help communities accomplish everything from forming data policies to building custom dashboards.



US Ignite Communities



US IGNITE COMMUNITIES CONVENING @ SMART CITIES CONNECT CONFERENCE & EXPO

In May 2023, US Ignite hosted an invite-only US Ignite Communities Convening in tandem with the Smart Cities Connect Conference & Expo in Denver, CO. This special gathering allowed our diverse network of community leaders, representing municipalities of all sizes, the space to share best practices, key learnings, and relevant resources.

US Ignite team members facilitated conversations between participants through highly interactive and engaging exercises and activities. Moreover, a fireside chat with Dr. Sharon Storver, the Philip G. Warner Regents Professor in Communication and former Chair of the Radio-TV-Film Department at the University of Texas, sparked thoughtful conversations on the impact of generative AI in city governments on the management of resident data privacy, and key strategies for local broadband deployments.

After a full day of peer learning, US Ignite Communities entered the first official day of the Smart Cities Connect Conference with a more robust network of peers and energized to improve residents’ lives through technology.

“Walking around this room and hearing so many peer communities talk excitedly about digital equity and smart cities in the same breath - I feel like I am in the right place, at the right time, doing the right work. This is my community.”



Geoff Millener, The Enterprise Center (Chattanooga, TN)

AIR QUALITY GROUP OFFERS BREATH OF FRESH AIR

The Air Quality Workgroup was a notable success story for the US Ignite Communities program in 2023. Building on a partnership that began in 2021 with five communities, the peer-learning group expanded to more than 100 individuals over the past year, including representatives from cities, research institutions, federal partners, nonprofits, and environmental quality organizations. The founding five communities – **Salt Lake City, UT; Chattanooga, TN; Cleveland, OH; Kansas City, MO; and Springfield, MA** – originally shared their experiences developing low-cost air quality monitoring networks using TELLUS Networked Sensor Solutions. That effort attracted other community leaders, who began to meet regularly to discuss their own air quality challenges, observations, and ideas for solutions. US Ignite published a blog series with key learnings and insights from the workgroup over the summer:

- [How to Improve Air Quality Monitoring](#)
- [Strategies for Safer Air](#)
- [The Next Generation of Air Quality Sensors](#)
- [Funding Opportunities for Air Quality Monitoring Projects](#)

Moreover, the workgroup launched an ongoing [Air Quality ACTION Seminar Series](#). These sessions start with a short presentation from a field expert or practitioner, followed by a question and answer section, and closing with an engaging roundtable discussion and share-out.

CONGRATULATIONS TO RED WING IGNITE FOR TEN YEARS OF INNOVATION



US Ignite’s first rural and smallest community partner, Red Wing Ignite (RWI) celebrated its 10th anniversary in 2023. We first invited RWI to join the Smart Gigabit Communities cohort a decade ago when the community-driven organization was pioneering gigabit broadband access in a rural setting. As part of the cohort, RWI gained access to a peer network of 25 other communities spearheading regional economic growth through expanded broadband access.

Since 2013, RWI has evolved into a regional anchor institution and secured prestigious national grants like the Economic Development Administration (EDA) i6 Challenge grant and the U.S. Economic Development Agency’s “Build to Scale” grant. They plan to continue finding innovative ways to achieve rural economic development.

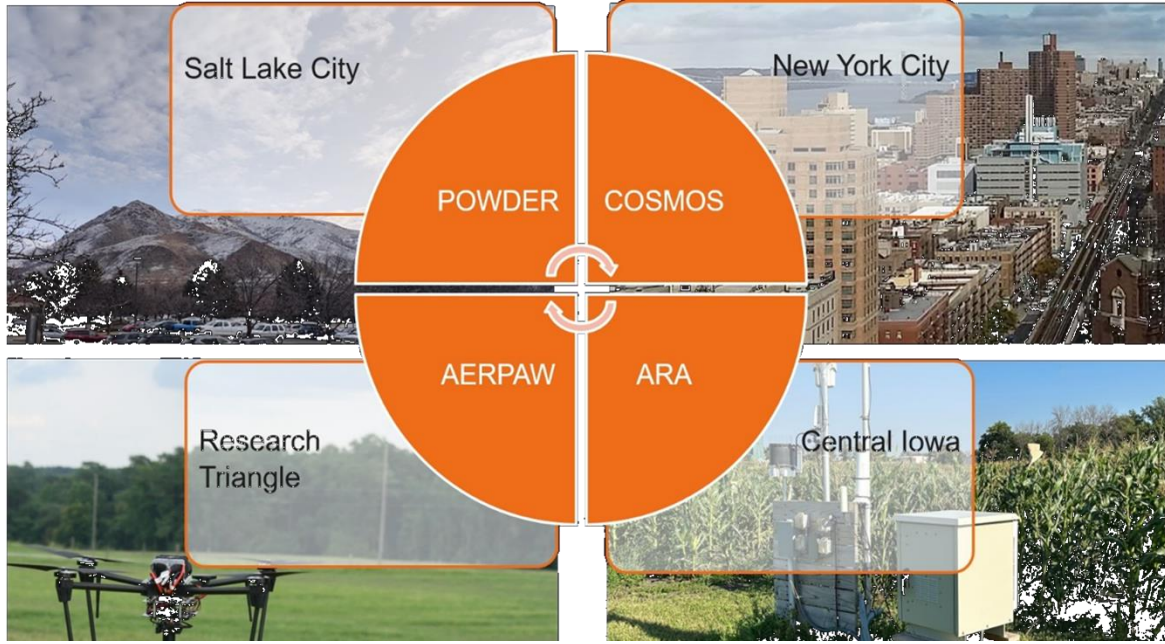


SPOTLIGHT: BROADBAND DEPLOYMENTS

Launch of Surge Link™ (Syracuse, NY) - The City of Syracuse, Community Broadband Network, and US Ignite launched a high-speed Internet connectivity program, Surge Link. Intending to connect 2,500 underserved families to affordable high-speed Internet, Surge Link leveraged existing city-owned assets and local partnerships to fast-track deployment. US Ignite advised the city on the overall technology, deployment models, and funding strategy.

Broadband Partner Selected for Borderless Classroom Pilot (Greensboro, NC) - This program will provide free broadband Internet and vital educational resources for students in three High Point, NC schools. US Ignite assisted Guilford County Schools (GCS) and the Technology and Data Institute (TDI) in developing the program. In the fall of 2023, the program managers selected Lumos as the broadband partner. The program aims to connect around 2,000 households in 2024.

Platforms for Advanced Wireless Research



The Platforms for Advanced Wireless Research (PAWR) program was created by the National Science Foundation and is managed by a team from US Ignite and Northeastern University. Its four large-scale testbeds enable advanced network research through 5G, 6G, and beyond.

ARA LAUNCHES AS TESTBED FOR RURAL WIRELESS RESEARCH



The PAWR program unveiled its fourth and final wireless testbed in 2023 with the launch of ARA. Designed for research into rural wireless connectivity and precision agriculture technologies, the platform is a multi-modal testbed combining both commercial and programmable network systems. At the platform's launch event, ARA showed how researchers could control sensor-equipped agricultural machines and collect and stream data on plant phenotypes over ARA's 5G standalone network. The testbed is based at Iowa State University, with coverage extending to local crop and livestock farms and parts of the city of Ames.

PAWR HOSTS SPECTRUM SHARING EXPERIMENTS AND OPEN RAN TESTING

As one of the most mature PAWR platforms, the POWDER testbed has become instrumental in the exploration of dynamic spectrum sharing technologies. In 2023, POWDER began hosting experiments to determine how spectrum used for weather radars could be safely shared with commercial wireless systems. Meanwhile, as momentum continued to grow behind the creation of open radio access networks (O-RAN), multiple PAWR platforms joined COSMOS in their designation as Open Test and Integration Centers (OTICs) by the O-RAN Alliance.

AERPAW DRONE CHALLENGE LIFTS OFF

In fall 2023, AERPAW launched its first contest in a series of new student drone competitions. The AFAR challenge asked participants to use a radio-equipped unmanned aerial vehicle to localize the radio signal from an unmanned ground vehicle nearby. Three teams took home top honors including prize money from commercial sponsors.



Smart Bases

BIG WIN AT FORT CARSON– APPLICATION OF THE YEAR!

After its deployment at Fort Carson, US Ignite’s Inclement Weather Decision Support (IWDS) App won major recognition in 2023 with an award for Intelligent Infrastructure Application of the Year by Topio Networks. The judges selected the IWDS App from 10 semi-finalists because of its utility, readiness to be delivered on various infrastructure platforms, and contribution to public health and safety.

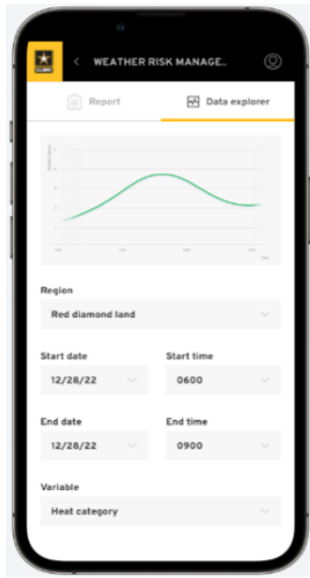
The IWDS App is an AI-powered application that provides operational recommendations to Fort Carson leaders based on the predicted impact of weather on traffic safety for commuters. When Fort Carson faces bad weather, leaders must make critical operational decisions, such as whether to keep the base open, reduce operating hours, or close it. The IWDS App provides officials with an easy-to-understand view of the anticipated weather impact on roadway safety across the broader region and actionable recommendations that optimize safety and productivity.

US Ignite developed the IWDS App as part of an effort under the U.S. Army Corps of Engineers Engineer Research and Development Center (ERDC). The app was also created under the “Artificial Intelligence for Traffic and Weather” program, which is funded to advance the Army Installation Modernization Pilot Program (AIMP2, formerly known as Installations of the Future) initiatives under the Assistant Secretary of the Army (Installations, Energy and Environment) (ASA IE&E).



Kyle Compton delivers three-minute pitch at Intelligent Infrastructure Conference in Austin, TX

MEET THE SMART INSTALLATIONS AND COMMUNITY DASHBOARD



In the ongoing effort to support Army modernization goals, US Ignite worked with Fort Moore leaders in 2023 to develop and launch new software applications under the Smart Installations and Community Dashboard (SICD) program. The successful development and deployment of the tools garnered an additional \$6.794 Million investment from the U.S. Army Corps of Engineers Engineer Research and Development Center (ERDC). That funding will be used to extend application operation and expand to new use cases. It will also facilitate the development of an Installation Operation Tool, unifying the systems and tools used by the Installation into a comprehensive command and control tool.

Fort Moore Deployments:

Application/Solution	Challenge	Function	Benefits
Heat Risk Management	Fort Moore recorded the largest share (16.7%) of all heat injuries among 250+ U.S. Military Installations between 2018 and 2022. Safety officers traditionally monitor for heat risk using manual and time-consuming processes prone to human error.	The HRM application employs IoT sensors and data analytics to automate the monitoring process for heat-related risk and proactively send updates and recommendations to safety officers.	Reduces the risk of heat-related injuries while training by removing the need for redundant, analog heat monitors in each training company
Remote Surveillance System	With a large and porous perimeter, Fort Moore faces a unique challenge in protecting assets and securing the installation.	The intelligent video solution uses LiveView Technologies (LVT) remote surveillance equipment and a user interface that has been integrated with an algorithm capable of distinguishing between soldiers and civilians.	Enhances and maintains physical security with reduced manpower requirements
Building Fault Detection and Energy Waste Savings Tool	Building faults in the heating, ventilation, and other electrical systems that can often go unnoticed can lead to energy waste and increased costs.	The tool leverages AI and ML-based algorithms to identify issues and send alerts about building-level system faults.	Helps pre-emptively detect building faults, reduce energy waste, and enhances energy efficiency

Challenge Competitions and Startup Support

INNOVATESLC – ACCELERATOR



2023 was a big year for US Ignite's startup and support program. Through our partnership with Kinect Capital (formerly VentureCapital.Org) we offered a smart city accelerator program to Salt Lake City startups. Seven startups completed the intensive 8-week course and gained the tools, resources, and support they need to continue growing their high-tech business:

- **LoChi Market** - LoChi Market is a digital marketplace designed to help micro and small consumer product businesses connect with local shoppers in a comprehensive virtual solution.
- **Blendyd Studios** - Blendyd Studios brings high-tech, mobile-first, automated solutions to low-tech recruitment in the trucking industry.
- **ARX** - ARX enables individuals and businesses to take control of their digital identities, building tools that improve trust, securely exchange data, and protect privacy.
- **Rechast** - The Airbnb of EV chargers. Rechast provides electric vehicle (EV) drivers an effective and fast way to recharge by matching them up with homeowners, who get an easy way to earn extra cash.
- **RefloDx, Inc.** - Non-invasive, low-cost device for detecting reflux. This low-risk ultrasound technology can help the 65 million Americans who suffer from it.
- **Right Angle Engineering** - Bringing the solar industry into the modern era by revolutionizing the solar permitting process to be simple and efficient.
- **TowPro** - Modernizing the towing and roadside assistance industry through a tech-driven approach.

SBIR GRANT WINNERS

Two exceptional startups from our InnovateSLC accelerator program secured Small Business Innovation Research (SBIR) Grants from the U.S Small Business Administration in 2023!

 **RefloDx** - \$1,000,000 (Phase II)

An estimated 80 million Americans suffer from gastroesophageal reflux, but RefloDx's noninvasive diagnostic solution will help speed up and lower the cost of detecting the condition. The innovation could save the healthcare system \$10 billion annually.

 **POWDER WATTS** - \$274,922 (Phase I)

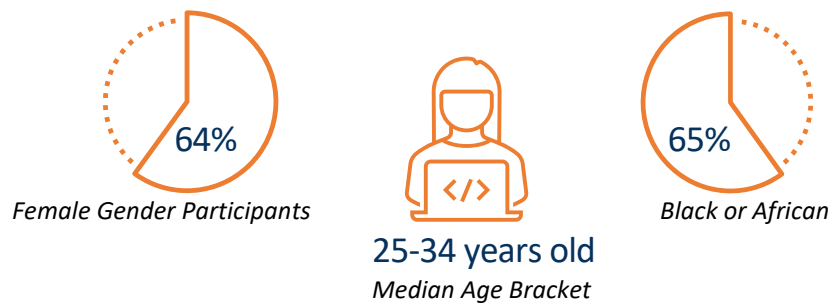
Heat cables, traditionally installed on millions of roofs in North America to prevent ice dams and roof damage, currently suffer from flawed controls and excessive energy consumption. Powder Watts is advancing the energy efficiency of heat cable systems with smart control systems powered by smart sensors and data analytics.



INNOVATEDMV - A HACKATHON TO TACKLE THE DIGITAL DIVIDE

US Ignite brought its startup services to the nation's capital in 2023, including a flagship 14-hour hackathon event hosted in Washington DC's historic Anacostia neighborhood. A unique component of DC's Startup Week, the Connect Anacostia Business Model Hackathon challenged participating hackers to develop ideas to tackle the digital and technical skills gap among Anacostia residents. As the hackers brainstormed and ideated throughout the day, they also learned about business models, business logic, and pitching from expert panels and keynote presentations.

Participant stats:



The winning team advocated for a municipal-owned node network - called AnaMesh - to deliver no-cost Wi-Fi access. The team won \$2,000 in prize money plus 10,000 Amazon Web Services credits per team member. All participants walked out with more access to resources, a bigger network, and a newfound understanding of cultivating a sustainable business.

The Connect Anacostia Business Model Hackathon succeeded thanks to the valuable input and support from local organizations: Anacostia Business Improvement District, DC Startup Week, Enlightened, and CivStart.

"I'm so grateful to have been a part of the Anacostia Hackathon, and I can't thank you enough for your unwavering hard work and dedication."



-Quentin Milner, Connect Anacostia Participant



AI FOR IOT INFORMATION (AI3) PRIZE COMPETITION

The "Smart Communities, Smart Responders: Artificial Intelligence for Internet of Things Prize Competition" (AI3 Prize Competition) came to an exciting end in 2023. Launched in 2021 by US Ignite, Texas A&M University, and Texas Engineering Extension Services (TEEX), the AI3 Prize Competition asked participants to develop solutions for collecting and creating real-time visualizations of IoT sensor data to aid public safety leaders and first responders in a crisis. Four teams made it to the final phase in the fall of 2023, where they had to demonstrate their AI system solution live at Disaster City® in College Station, Texas. Two teams secured \$90,000 first-place wins:



CNA-rirs developed an application called First Responder Awareness Monitoring during Emergencies (FRAME). FRAME can collect and organize data from building sensors or video feeds and provide a real-time picture of what is happening during an emergency for first responders using smart technologies like AI.



Engineering Dynamics used AI algorithms and synthetic IoT data generation to make accurate predictions about unknown IoT devices. Their solution prioritized efficient algorithms whenever possible, deploying information to standard mobile devices carried by first responders.

The AI3 Prize Competition displayed the remarkable skills and ingenuity of the teams involved and underscored the significance of collaborative efforts among academia, industry, and government entities. The showcased AI systems possess the capacity to revolutionize the utilization of public safety data, ultimately playing a crucial role in improving the safety and well-being of communities nationwide.



Smart Cities Data

AUTONOMOUS VEHICLE (AV) DIGITAL TWIN

Digital twins, virtual replicas of physical entities, offer endless possibilities for enhancing efficiency, sustainability, and resilience in cities, communities, and bases. In 2023, US Ignite's data scientists worked diligently on a proof of concept for an AV Digital Twin, primarily using data obtained during the AV Shuttle Pilot at MCAS Miramar.

The AV shuttles piloted at MCAS Miramar collected massive amounts of sensor data, including lidar and camera feeds, GPS & IMU data, and vehicle state information. The proof of concept uses this data, Google Maps satellite data, plus open source Autoware Autonomy Stack to show the feasibility and uses of a virtual AV testbed. Such a tool could fulfill multiple use cases involving Autonomous Vehicles (AV), Energy Infrastructure, Distributed Energy Resources (DER), and Range Control.

US Ignite continues to refine the proof of concept to achieve a minimum viable product (MVP) in 2024. Some key features planned for the MVP include a vehicle model running in a simulation engine, a better road map and generally improved visuals, and the ability for deeper testing and demonstration of auto autonomy.

NATIONAL ECONOMIC IMPACT BROADBAND TOOL

US Ignite continued progress on building the National Economic Impact Broadband Tool to help community decision-makers address core issues of equity, inclusion, and access to quality broadband Internet. The end-to-end solution highlights the areas where broadband investments can deliver the greatest benefit or have the most impact in closing the enduring digital divide.

One of the tool's innovative attributes uses Chat-GPT to allow users to upload a snapshot of census tract data (easily obtained via the tool) to get a customized draft of an effective grant proposal using the specific location's data.

US Ignite will launch the National Economic Impact Broadband Tool in 2024.

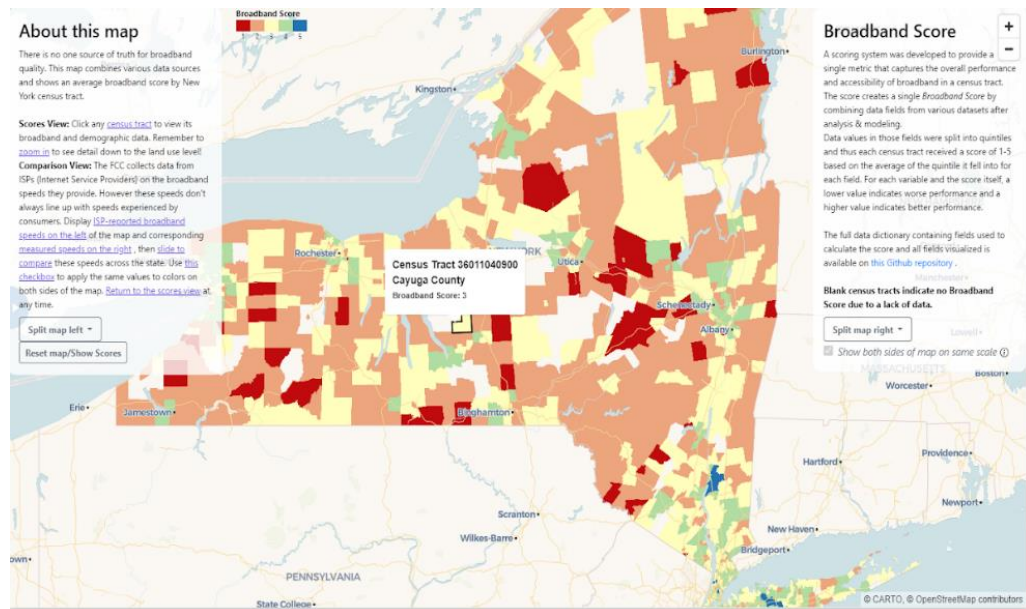
KEY FEATURES

Economic Growth Forecast -

Compares the economic growth of a community that hasn't received funding with one that has received funding in the past.

Broadband Score - A single score encompassing several broadband indicators to help predict the impact of expanded broadband.

Inequality Assessment - Highlights areas with significantly limited broadband access.



Looking Forward in 2024

HIGHLIGHTS FOR THE YEAR AHEAD



5G AND NEXTG NETWORKS

Through an expanded and fortified partnership with the National Spectrum Consortium, US Ignite will help advance research to support US spectrum strategy and innovations enabled by Open RAN, AI/ML, and wireless sensing technologies.



SMART BASES

The Smart Bases team will continue to advance the modernization of Army installations through the execution of advanced technology pilot projects. Our unwavering commitment to innovative smart city solutions will ensure the Department of Defense is prepared for future operations.



US IGNITE COMMUNITIES

US Ignite continues seeking communities to join its dynamic network. The team will continue to design and deploy more innovative projects, leveraging connectivity and cutting-edge technologies to catalyze sustainable growth in local economies.



PAWR

As open, neutral testbeds, the PAWR platforms are prepared to support studies in 2024 of spectrum bands targeted by the National Spectrum Strategy. The platforms are also enabling end-to-end Open RAN system testing and pursuing new commercial partnerships to further software-driven networking innovation.

Thank you to our Boards

We deeply appreciate the contributions of all our board members!

BOARD OF DIRECTORS:

- **Bill Wallace** – Co-Founder and Chairman of the Board, US Ignite
- **Lev Gonick** – CIO, Arizona State University
- **Joe Kochan** – Co-Founder, US Ignite and Executive Director, National Spectrum Consortium
- **John Leibovitz** – Venture Partner, Columbia Capital
- **Mike Marcellin** – Former CMO, Juniper Networks
- **Nick Maynard, Ph.D.** – Co-Founder and CEO, US Ignite
- **Celia Merzbacher, Ph.D.** – Executive Director, Quantum Economic Development Consortium SRI International
- **Renata Afi Rawlings-Goss, Ph.D.** – Executive Director, South Big Data Innovation Hub
- **Dorothy Robyn** – Former Deputy Undersecretary of Defense
- **Glenn Ricart, Ph.D.** – Co-Founder and CTO, US Ignite
- **Deb Socia** – CEO, Enterprise Center

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- **Monisha Ghosh, Ph.D.** – Professor of Electrical Engineering, University of Notre Dame
- **Bob Metcalf** – Emeritus Professor of Electrical and Computer Engineering, University of Texas at Austin
- **Sue Spradley** – Partner, Tap Growth Group

CONGRATULATIONS TO FCC COMMISSIONER ANNA GOMEZ

US Ignite is very proud of former advisory board member, Anna Gomez, for rising to the challenge of filling the long-time vacant FCC Commissioner position.

