



SUBMISSION FORM

All submission forms must include the following information. Separate submission forms must be turned in for each eligible program. **Deadline: July 1, 2024.** Please include this submission form with the electronic entry. If you do not receive an email confirming receipt of your entry within 3 days of submission, please contact [Gage Harter](#).

PROGRAM INFORMATION

County: Franklin
Program Title: Off-Grid Solar Backup Radio Site
Program Category: (1) Communications, (3) Public Safety

CONTACT INFORMATION

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SIGNATURE OF COUNTY ADMINISTRATOR OR DEPUTY/ASSISTANT COUNTY ADMINISTRATOR

Name: Steve Sandy
Title: Deputy County Administrator
Signature: *Steven Sandy*

Off-Grid Solar Backup Radio Site

Executive Summary

The County of Franklin proudly submits the innovative Boones Mill Radio/Solar Site Project for the 2024 VACO Awards. This project not only addresses a critical emergency services communication gap through a novel use of solar power and analog repeaters but also exemplifies unparalleled intergovernmental and public-private cooperation.

The Town of Boones Mill, and immediately surrounding areas of Franklin County present a unique geographic challenge in radio coverage. Terrain challenges and a deep valley has presented coverage challenges for emergency services radio utilization. Prior attempts to correct this issue fell short, and a long-term definitive solution (an additional radio tower/site) is two or more years away, due in part to historic preservation requirements near the town of Boones Mill.

A team comprised of County Staff, volunteer Firefighters, Sheriff's Office Deputies, a local electric contractor, and the Town of Boones Mill staff formed to discuss an innovative solution. Together, this team identified funding sources, repurposed town property, and together, erected an off-grid solar repeater site at a town water tank, positioned ideally, on a hill above the town.

The project implemented an analog repeater that serves the town and immediate surrounding area. The site utilizes a different radio channel to patch responders, including fire, EMS, Sheriff, and police into dispatch. While not perfect, this gives responders the option to switch to the Boones Mill channel and communicate critical information when they lose reception on primary channels.

The total project expenditure was kept to under \$10,000, with a notable amount of donated or reused material and labor.

Problem Statement

Identifying a unique challenge in Boones Mill—an area with significantly poor radio coverage that compromised first responder communication—we sought a timely, innovative solution. The Boones Mill town, and immediately surrounding areas of Franklin County present a unique geographic challenge in radio coverage. Terrain challenges and a deep valley has presented coverage challenges for emergency services radio utilization. Prior attempts to correct this issue fell short, and a long-term definitive solution (an additional radio tower/site) is two or more years away, due in part to historic preservation requirements near the town of Boones Mill.

Radio tower construction and tower site development is not a simple task. It is estimated that a definitive solution for seamless radio coverage in this area will cost more than two million dollars. The county is committed to securing partnerships and resources to enact a long-term solution for this coverage issue; however, a stop-gap solution is essential for responder safety.

The Town of Boones Mill is positioned in a valley, surrounded by Murray's Knob, Cahas Mountain, Little Mountain, and Bunker Hill. This unique terrain presents several challenges for effective radio coverage within the town and its many small streets and main roads. In addition to topography, Boones Mill has several historic structures, including the train depot and retail area in its downtown area. The town is near the "Cahas Mountain Rural Historic District". Tower construction must be precisely located to address this topography, and the adjacent historic sites require clearance from historic preservation groups prior to any groundbreaking.

Innovative Solution, Inter-Governmental Collaboration

Where traditional fixes fell short, and a definitive solution (Tower construction) was not only costly, but would take years to bring to completion, the county sought out an interim solution. Our goals for the interim solution included being sustainable, timeliness, and cost effective. This prompted a collaborative effort between Franklin County Public Safety Communications, Franklin County Sheriff's Office, the Town of Boones Mill, and the Boones Mill Volunteer Fire Department, alongside invaluable support from local businesses like Pittman Electrical Contractors. Together, we devised a plan to utilize a vacant water tank as a base for a solar-powered analog repeater system, creatively overcoming the area's geographical and infrastructural constraints. We acknowledged that this interim solution would not be seamless for our public safety radio users, but with proper training, we planned for education with our users on this solution.

Model for Localities

This project stands as a testament to what can be achieved with ingenuity and collaboration. By repurposing existing infrastructure (an unused water tank) and integrating sustainable power sources (solar energy), we crafted a solution that is not only effective but environmentally conscious. The cooperative effort between local government, volunteers, and businesses underscored the power of community and the potential of public-private partnerships to solve complex problems.

Importantly, the Boones Mill Radio/Solar Site Project serves as a scalable and adaptable model for other local governments facing similar communication challenges. The integration of

Off-Grid Solar Backup Radio Site

off-grid solar power with analog repeaters provides a blueprint for rapid, cost-effective enhancements to emergency communication systems. This initiative's success, marked by improved coverage and enhanced first responder safety, is quantifiable and can inspire similar endeavors throughout Virginia.

Execution and Financing

The total project expenditure was kept as low as possible, with a notable amount of donated or reused material and labor. A high-level list of items used in this project is outlined below:

- 700/800 Mhz Conventional Repeater
- Antenna Structure and Coax
- Solar System with Battery and Charge Controller
- Simulcast Radio
- Weatherproof outdoor cabinet

Additionally, to develop the site and implement the solution, we required the following:

- Road Repairs and Brush Clearing (donated)
- Concrete Pad (donated)
- Existing Land/Site (Water Tank Owned by Boones Mill Town)
- Bucket Truck / Electrical Contractor Labor (donated)
- Analog 700mhz Frequency (Previously Licensed)
- Public Safety Staff Training
- Radio Updates/Reprogramming of subscriber radios

The project came together seamlessly with the support of those involved.

Off-Grid Solar Backup Radio Site

As we continue to refine and improve upon this temporary solution, the project's sustainability and adaptability remain central to our planning. Looking ahead, we are committed to not only maintaining but also evolving this system in alignment with technological advancements and the specific needs of our community and first responders.

Conclusion

The Boones Mill Radio/Solar Site Project exemplifies innovation in public service, fostering intergovernmental cooperation, and offering a replicable model for enhancing emergency communication infrastructures. It is a clear demonstration of Franklin County's commitment to leveraging technology, collaboration, and sustainability to address critical community needs. We are honored to present this project for consideration at the VACO Awards and eagerly anticipate the opportunity to share our learnings and successes with other municipalities.

We thank VACO for recognizing such initiatives that highlight innovation, collaboration, and public service excellence.