Corporation for Public Broadcasting
Appropriation Request and Justification
FY 2023

Submitted to the Homeland Security Subcommittee of the House Appropriations Committee
and
the *Homeland Security Subcommittee of the Senate Appropriations Committee*

March 28, 2022

This document with links to relevant public broadcasting sites is available on our Website at:

www.cpb.org

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Overview of Public Media

Since the 1920s, people across the United States have launched public broadcasting services in their communities to champion the principles of diversity and excellence of programming, responsiveness to local communities, and service to all.

Today's public media system reaches nearly 99 percent of the U.S. population over-the-air with free educational, news and public affairs programming and public safety services. Public media utilizes broadcast and digital platforms to provide essential public services to rural and urban communities.

The Corporation for Public Broadcasting (CPB) supports 396 grantees, representing 1,187 public radio stations and 158 grantees representing 356 public television stations. These independently operated noncommercial, non-profit local public television and radio stations are each licensed by the Federal Communications Commission and overseen by a local governing body. Public media's infrastructure provides the broadest, nationwide communications platform, delivering educational, informational, and public safety services to the American people.

Public media creates and distributes content that is by, for, and about Americans of all backgrounds, and its service fosters dialogue between and among the American people. In addition to the critical local journalism that provides information to help communities respond to and recover from natural and humanmade disasters, public media stations provide essential public safety and emergency alert services that help prepare and protect vulnerable communities. In a world where there are numerous outlets for information, public media continues to be America's most trusted and reliable institution for news and educational programming.

Public television and radio stations have long played an integral role in our nation's emergency alert system, and the partnership between PBS, NPR and local stations provides unsurpassed resilience for of our nation's public safety systems. With a national-local structure, public media entities can distribute national, state, and regional emergency alerts, and provide encrypted, geo-targeted alerts to local communities in times of need.

The COVID-19 crisis has demonstrated how the public media system provides universal access to indispensable education, information, and public safety services to all Americans, including in unserved and underserved areas. Simply put, the public broadcast telecommunications infrastructure provides an essential lifeline to news and public affairs, community resources, critical health and public safety information, and the education needs of our nation's children.

Section I- Department of Homeland Security Next Generation Warning System (NGWS) Funding Request

CPB Supports a $40 million request for the Next Generation Warning System (NGWS) in FY 2023

The Corporation for Public Broadcasting is grateful for Congress' FY 2022 support of $40 million for the Next Generation Warning System (NGWS). These funds are critical in helping public media stations replace and harden their communications infrastructure.

Today, we join the public broadcasting community in supporting a continued $40 million appropriation in FY 2023 for the Next Generation Warning System (NGWS) within the U.S. Department of Homeland Security's FEMA Federal Assistance Grants account. As part of the Integrated Public Alert and Warning System (IPAWS), this competitive grant program will utilize public broadcasting to enable the expansion of alert, warning and interoperable communications and the incorporation of emerging technology in those activities, consistent with the recommendations in the *Modernizing the Nation's Public Alert and Warning System* report from the FEMA National Advisory Council, February 15, 2019.

NGWS would allow for public telecommunications entities, as defined in 47 USC 397(11), to procure, construct and improve transmission and other public safety-related equipment, software, and services, including ATSC 3.0, datacasting and MetaPub. This will result in enhanced alerting and warning capabilities that serve all Americans.

Public Media's Role in Public Safety

Combined, public television and public radio stations reach nearly 99 percent of the American population. With its nearly ubiquitous reach, Congress and first responders recognize public media stations as a critical component of our nation's public safety network. Since September 11, 2001, CPB has invested in building local station capacity to assist emergency service providers. Currently, in many states and local communities, public media stations' digital and broadcast infrastructure provide a backbone for emergency alert, public safety, first responder and homeland security communications services.

In 2006, Congress passed the WARN Act, which established a voluntary system that allows cellular phone companies to notify their subscribers of imminent threats to life or property. Pursuant to the Act and subsequent FCC rules, the PBS WARN program was initiated to enable all public television stations to send every Wireless Emergency Alert ("WEA") out over every public television transmitter to provide a "hardened, redundant" alternate path for the cellular companies' connection to the alerts. Since 2013, public television has been an essential partner in the WEA system, helping to ensure that every alert reaches every person. Public television stations are established lifesaving forces in their communities, even for people who might never turn on a television.

PBS WARN recently completed a total system overhaul to ensure compliance with the FCC's WEA Report and Order 16-127, which mandated improvements to the WEA system. This update enabled PBS WARN to continue to provide a reliable backup to the WEA system at the FCC's current specifications and also provided new, supported equipment to each public television

licensee. These improvements will serve as a starting point for stations to expand their public safety footprint, and the NGWS grant program will leverage this existing infrastructure to enhance and expand public safety services.

In March 2016, the FCC's Communications, Security, Reliability and Interoperability Council's (CSRIC) Working Group 2: "Emergency Alerting Platforms" acknowledged the importance of public broadcasting to alert dissemination, stating "PBS WARN is a safeguard to ensure delivery of the WEA, even in the event that a cybersecurity or other event disrupts the primary WEA delivery path."[1]

In June 2018, the FCC's CSRIC Working Group 2 issued a final report on "Comprehensive Re-imaging of Emergency Alerting."[2] Section 6.4 of the Report identifies three ways NextGen (ATSC 3.0), and specifically public television, can support and improve emergency alerting. Section 6.4 of the Report states:

> "PBS and local public television stations play a crucial role in protecting communities by using datacasting to deliver essential information to individuals and first responders. These benefits are all made possible by public broadcasting stations' unique reach, reliability, and role across America, and are especially vital in rural and underserved areas."

The Report further states, "we believe that PBS stations and first responders can find even more ways to identify and utilize opportunities presented by ATSC 3.0."

The February 15, 2019 report, *Modernizing the Nation's Public Alert and Warning System* from the FEMA National Advisory Council, truly cements the importance of public broadcasting's role in public safety and identifies a need for continued partnerships, recommending that FEMA encourage "use of public broadcast capabilities to expand alert, warning, and interoperable communications capabilities to fill gaps in rural and underserved areas."[3]

The Public Radio Satellite System® (PRSS), managed by NPR, receives a national EAS feed directly from FEMA to send Presidential emergency alerts to local public radio stations, including NPR Member and non-member stations. NPR/PRSS is also named as a resource in at least 20 states' emergency plans, according to the FCC.[4] Many of the public radio stations in these twenty states serve as Primary Entry Point (PEP) stations. The PRSS network includes almost 400 interconnected stations, which serve 1,247 local public radio stations. This large

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[1] CSRIC VI, Working Group 2, Emergency Alerting Platforms: WEA Security Sub Final Report. March 2016. https://www.fcc.gov/about-fcc/advisory-committees/communications-security-reliability-and-interoperability#block-menu-block-4

[2] CSRIC Final Report on "Comprehensive Re-imaging of Emergency Alerting." June 2018. https://www.fcc.gov/files/csric6wg29junereportcomppdf

[3] Modernizing the Nation's Public Alert and Warning System Report from the FEMA National Advisory Council, February 15, 2019. https://www.fema.gov/media-library-data/1550587427456-30d4179ee4fa8b97ecf4ab6bee76ace6/NAC_IPAWS_Subcommittee_Final_Report.pdf

[4] https://www.fcc.gov/public-safety-and-homeland-security/policy-and-licensing-division/alerting/general/state-eas-plans

national network supports secure, reliable communications during emergencies without relying on the Internet, which may be offline or unreliable.

During the past eight years, NPR/PRSS, with financial support from CPB, has been helping public radio stations implement MetaPub technology so they are capable of sending text and image metadata simultaneously with their live radio broadcasts.[5] For example, the emergency alert information from state, regional and local emergency officials, such as tornado and hurricane warnings, evacuation routes, and COVID-19 information, can be heard and seen on mobile phones, HD radios, "connected car" smart dashboards, smart home speakers and other radio data system displays, and via online audio streaming. Today, approximately 10 percent of interconnected public radio stations have the capability to issue live text alerts using the MetaPub system in the event of a natural or humanmade disaster.

The first MetaPub alert for a non-weather event was issued by WVIK-FM, in Rock Island, Illinois. The station, which serves the Quad Cities area and is a licensee of Augustana College, alerted listeners and viewers to COVID-19 information.

In cooperation with the Rock Island County, Illinois, Emergency Management Agency ("EMA"), WVIK (pictured above) is the primary relay station for emergency information concerning the Exelon Quad Cities nuclear power generating station. In the event of an emergency at the nuclear plant, the county agency will contact station personnel, and the station will broadcast the EMA message.

Initial grants from CPB enabled MetaPub equipment to be installed at stations in California, in parts of the Midwest, including "Tornado Alley," and in stations serving the Gulf Coast and southeastern United States. Funding for the Next Generation Warning System would provide all

[5] Metadata is descriptive information about programming (it could be station identification, logo, program, air date, topic, host or reporter names, photos, graphics, maps and the format could be text, images or links).

public radio stations with access to funds to install MetaPub, enabling them to issue and disseminate enhanced local and regional alerts specific to their communities. The installation for the remaining stations across the country would cost between $8.5 million and $10 million, or about $15,000 per station.

Hurricane test alert by Miami-based WLRN on car dashboard screen.

From a programming perspective, public radio stations keep their audiences informed continuously during disasters across broadcast and digital platforms. For example, when natural disasters fall short of triggering an EAS alert, public radio stations still provide local weather alerts, announcements from local officials, and information on where residents can access emergency services.[6]

In rural and remote areas, public media is often the only source of local news and public safety information, and native-owned public media stations serve some of the most remote and least connected areas in the nation. These stations partner with the tribal governments, local public safety officials, local health agencies, and Regional Bureau of Indian Affairs offices to distribute essential health and safety information. For example, KBRW-AM in Barrow, Alaska is the only broadcast service available in an area of more than 90,000 square miles. The station airs programming and announcements, in English and Inupiat, from the Borough School District, health department and local hospital and police departments. Without stations' broadcast infrastructure, many Americans, especially those in rural areas, would lack access to lifesaving information and public safety alerts.

Public radio also requires funding to support the refurbishment and maintenance of state and regional public radio networks. These networks enable local stations to expand their reach statewide or regionally by connecting multiple transmitters by satellite. Similar to the national

[6] NPR's comments to the Federal Communications Commission on "Amendments to Part 4 of the Commission's Rules Concerning Disruptions to Communications." December 6, 2021. https://ecfsapi.fcc.gov/file/1206157775505/NPR%20Resilient%20Networks%20NPRM%20Comments.pdf

interconnection system, each regional network is a critical communications link to rural, underserved communities across America – especially during emergencies.

Public Safety Station Examples

Between March 12, 2020 and January 18, 2022, more than 13,091 WEAs have been issued by state and local authorities and transmitted over the PBS WARN system in different parts of the country. Approximately 654 of those alerts were for COVID-19, harnessing for the first time the reach and ubiquity of mobile device communications to address a pandemic.

The University of North Carolina Center for Public Television ("UNC-TV") uses its statewide broadcast network, livestreaming capabilities, and digital platforms to provide vital information to the public. UNC-TV is a crucial link between public officials and the more than 10 million North Carolina citizens before, during and after emergencies. This essential service includes:

- UNC-TV Transmission Sites: Over 40 Federal, State, and Local agencies, including law enforcement and emergency management organizations, depend on 20 UNC-TV towers for their communication systems.

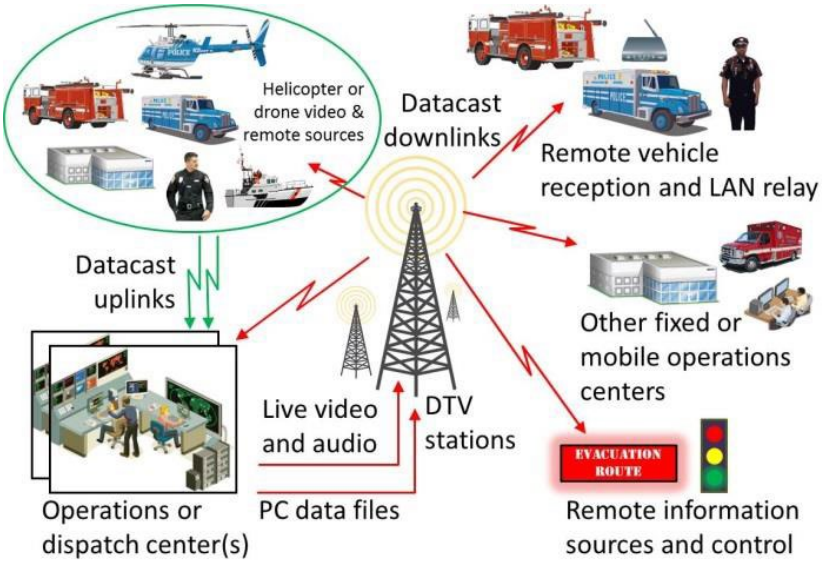
- UNC-TV Distribution Networks: The UNC-TV microwave radio infrastructure serves as the critical backbone for the State Highway Patrol and North Carolina Emergency Management communication networks.

- UNC-TV Emergency Broadcasts: UNC-TV broadcasts, streams, and distributes vital emergency information accessible via various media and digital platforms. This information includes North Carolina Emergency Operations Center briefings from the Governor and other National, State and Local authorities.

Nearly 10 years ago, WUFT-FM (Gainesville, FL) and the collaboration of public media stations throughout Florida created the Florida Public Radio Emergency Network or "FPREN," which provides public media with the tools to deliver comprehensive public safety and emergency communications across broadcast and digital platforms to support listeners, emergency management officials, and first responders. FPREN has provided real-time multimedia content to public media in Florida for various severe weather events, including Hurricanes Irma, Michael, and Matthew. Two years ago, FPREN expanded its service to include the South Carolina Emergency Information Network.

WWNO-FM in New Orleans is MetaPub enabled and links to the NOAA/NWS forecast stream so that local station weather can appear across screens. In September 2021, when Hurricane Ida took down the power grid and knocked many commercial radio stations off the air, WWNO remained one of the few stations left to broadcast vital information in New Orleans.

During weather emergencies, the Houston Fire Department and Houston Police Department can use Houston Public Media's datacasting technology to stream live video of weather conditions and fire hazards to the Emergency Operations Center. Datacasting also provides first responders with the ability to securely communicate during the crisis to help them assess conditions and make informed decisions. When needed, Houston Public Media can use its radio multicast channels to broadcast multiple programs at once to provide comprehensive storm coverage to listeners.



In Ohio, OEAS Public Alertnet covers the entire state with a joint datacast project that supports emergency alerting bound for the public. A companion to the existing EAS system, Alertnet does not rely on the Internet and provides a common infrastructure tying all eight Ohio public TV licensees and their 12 public television stations together for future public safety needs.[7] Nationwide deployment of the Alertnet concept could help meet one of the recommendations from the FEMA National Advisory Council to use "public media broadcasts as one such technology to supplement the national 'Primary Entry Point' (PEP) strategy,"[8] ensuring that all-hazard alerts reach the intended recipients every time.

In October 2020, due to a violent storm, KOSU in Stillwater, Oklahoma, and Oklahoma City provided continuous live information about power restoration, debris clean up, and information about alternate voting sites and accommodations made on an emergency basis.

Twin Cities Public Television (TPT) provides real-time healthy and public safety warnings and alerting for multi-lingual audiences. This service fills a communication gap for police, fire, emergency management and other "initiators of warning and alerts" by working with public safety and cultural communities to pre-load or customize messages so broadcast viewers can see and hear warnings and alerts in English, Spanish, Hmong, and Somali.[9] Additional funding resources would allow TPT to collaborate with technology and software developers and PBS Warn to build and test a new multilingual alerting support system based in the cloud. This new emergency alert solution is adaptable and can be scaled to support any alert originator nationwide.

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[7] https://www.radioworld.com/news-and-business/ohio-digital-alerting-system-is-active

[8] Modernizing the Nation's Public Alert and Warning System Report from the FEMA National Advisory Council, February 15, 2019. https://www.fema.gov/media-library-data/1550587427456-30d4179ee4fa8b97ecf4ab6bee76ace6/NAC_IPAWS_Subcommittee_Final_Report.pdf

[9] https://www.twincities.com/2019/07/07/local-station-wants-to-be-source-for-limited-english-speaking-communities-before-and-after-a-crisis/

Maine Public Broadcasting Network makes its statewide spectrum available to federal and state authorities to communicate with first responders and the media in the event of an emergency. The one-way closed communication system is designed to work even when Internet connections and electricity are not working.

Vegas Public Television works with Clark County Emergency Management to provide an immediate alternate phone bank, using existing pledge banks, to take non-emergency calls during an incident that taxes primary emergency operations centers. Vegas PBS also has a partnership with emergency officials that includes a database of floor plans and student contact information for more than 400 school buildings, all of it available instantly to first responders via the station's datacasting system. It was unexpectedly used during a recent forest fire near one school.

New Hampshire PBS (NHPBS) is part of a microwave network across the state that services Homeland Security, the Departments of Safety, Transportation, Economic Development, and the National Guard. Funds from a newly created Next Generation Resilient Warning System account could be used to maintain equipment for this important network. Further, NHPBS is located within 30 miles of a nuclear power plant and 90 minutes north of Boston. Should there be a major event along the New Hampshire seacoast or Boston south, the New Hampshire Department of Safety's Interoperability Office projects many people from the south heading to the north and west to evacuate. To provide emergency support services in this scenario, NHPBS would need to: 1) upgrade the studio generator to power the entire building including the studio; 2) upgrade the uninterruptable power system (UPS) to handle the entire building; 3) procure a new LED lighting system to reduce power loads; and 4) upgrade the phone system to handle emergency communications for the region.

Jefferson Public Radio in Ashland, Oregon, created an online tool called the "JPR Wildfire Tracker," to track the status of every active wildfire during the summer 2021 wildfire season.

WHRO Public Media in Hampton Roads, Virginia, interconnects the public safety agencies in the area with multiple emergency operation centers (EOCs) and other critical public safety locations via their optical fiber network. Through cooperative efforts, WHRO connects to this network and receives video content from any connected EOC. The use of standard video conferencing equipment turns every EOC into a broadcast-ready location for press briefings and on-air news conferences.

Georgia Public Broadcasting (GPB) partners with the Georgia Emergency Management Agency (GEMA) to distribute critical information in times of emergency. Along with standard EAS alerts for radio and television, GPB serves as the official distributor of evacuation route information during State-ordered evacuations. Evacuation route signs are marked with corresponding radio station frequencies. In an emergency, GPB interrupts regular programing to provide lifesaving information. GPB also works directly with the Governor's office to deliver critical updates from the Governor and GEMA officials over radio and over GPB's digital services including web, and mobile apps.

Tennessee public television stations (WKNO, Memphis; WLJT, Lexington; WNPT, Nashville; WCTE, Cookeville; East Tennessee PBS, Knoxville; and WTCI, Chattanooga) use part of their broadcast spectrum to deliver encrypted videos, files, alerts, and other data to officials statewide, as needed, during emergencies and natural disasters.

South Carolina Educational Television (SCETV) is responsible for the ownership and management of all state transmitter sites and interconnecting networks. This includes infrastructure used by and implemented for state public safety and government operational radio systems. This is one of several examples where public media entities host or share site costs, emergency power and technical staff resources.

In August 2019, Alabama's Department of Homeland Security Science and Technology Directorate (DHS S&T) hosted an earthquake preparedness drill in Birmingham, utilizing public television datacasting from Alabama Public Television as a critical component of the exercise. The training event involved an earthquake taking place during a football game. The drill planned for thousands of spectators to evacuate, with hundreds being hurt or killed, and responders dealing with compromised communications. Several technologies were deployed and tested to see how the response could be improved. It was assumed that cell towers would be compromised during the earthquake, so mesh networks that do not rely on cellular were deployed. Drone and body camera video used the mesh network to feed into the public television datacasting system, which then broadcast to responders on the scene, as well as operations centers around the state.

KVIE public television in Sacramento has worked with the California Office of Emergency Services (Cal OES) to figure out how to deliver early earthquake warnings faster. In a field test using public television's datacasting ability, an early earthquake warning was delivered in under three seconds. The previous warning standard was 30 seconds. Four other California public television stations, KPBS in San Diego, KQED in San Francisco, PBS SoCal in Los Angeles, and Valley PBS in Fresno participated in subsequent testing of public television's datacasting system for earthquake early warnings.

System Infrastructure Needs

In 2017, CPB commissioned a comprehensive System Technology Assessment to better understand public television and radio stations' technology challenges and needs. The station response rate was unprecedented (73 percent of radio and 92 percent of television licensees), cataloging more than 60,000 pieces of equipment throughout the system that need to be updated or replaced. This Assessment projected that the system's financial capacity to address its equipment repair and replacement issues would total more than $300 million by 2020.[10] While CPB does not have an updated system assessment, there is every reason to believe that the financial challenges that stations face in meeting their equipment needs have only grown. Total revenue for public broadcasting stations decreased by 4.9 percent between FY2019 and FY 2020, while CPB's funding increased for the first time in a decade in FY 2022. Over the past several years, stations have experienced equipment failure causing them to be off the air from several days to several weeks. During this time, critical public safety services are compromised.

The Assessment further found that 86 percent of TV stations and 75 percent of radio stations tend to postpone replacing their technology equipment when faced with a lack of funds. By postponing replacements, stations are at a greater risk of going off the air, not being able to fulfill their missions, and being forced to make purchases without having the lead time to negotiate better equipment deals. Almost half of TV stations and a quarter of radio stations stated that they

[10] CPB System Technology Assessment Final Report. Eagle Hill Consulting. May 21, 2017. http://www.cpb.org/files/reports/Final_Report-CPB_System_Technology_Assessment_2017.pdf

scaled back their equipment replacement plans with less optimal specifications due to a lack of funding. As the public media system postpones replacing aging equipment beyond its end-of-life, local stations face increased risk of technological failure, lost production and broadcast time that ultimately affects the educational, informational, and public safety services to their communities.

Without adequate resources to maintain and replace broadcast transmission infrastructure on schedule, TV and radio licensees of all sizes and types could face operating challenges nationwide, disrupting the essential public safety service these stations provide. The elimination of critical federal funding resources more than a decade ago has contributed to the growing financial needs for licensees nationwide as aging infrastructure and natural disasters challenge the nation's public media networks. The $40 million appropriated for the NGWS in FY 2022 is a meaningful first step in maintaining and replacing public media's transmission infrastructure.

Eyes on IPAWS: Leveraging stations' existing PBS WARN infrastructure to provide situational awareness tools to emergency management.

At the request of the California Governor's Office of Emergency Services (Cal OES), PBS and Sacramento member station KVIE developed tools that would provide the state's emergency managers a live feed of WEAs from their local public television station and access to expired and cancelled alerts. The alerts are in the Common Alerting Protocol format, which allow emergency managers to use the information for situational awareness, training, and data analytics. The Eyes on IPAWS tool, comprised of an antenna, a receiver, and a window-based app, allows the user to access the output from their local public television station's PBS WARN feed. Knowing that there were potential use cases that would benefit the easy access of an Internet-based feed of the WEA alerts, PBS developed warn.pbs.org, a website that displays active alerts across the country with the ability to filter alerts based on alert type, location, and keyword searches and a look-back feature for expired and cancelled alerts. This site has proved very helpful to emergency managers across the country, and has been lauded on social media and recommended by FEMA to all alert originators. Expanding and supporting these situational awareness tools would provide valuable resources to emergency managers nationwide for the incremental costs of software development, testing, installation, and support.

Public Safety & ATSC 3.0 ("NextGen TV")

The broadcast industry is undertaking a major transition, moving from the current broadcast standard Advanced Television Systems Committee (ATSC) 1.0 to a new Internet Protocol-based ATSC 3.0, or the Next Generation (NextGen TV) television standard. In February 2018, the Federal Communications Commission (FCC) published the standard for voluntary adoption by both public and commercial television broadcasters. The new standard is currently being deployed, and it is expected that ATSC 3.0 be widely adopted by the industry and by viewers over the next five to ten years.

In addition to enhanced accessibility and audio-visual enhancements, one of the principal benefits of NextGen TV is enhanced public safety alerting. The features and functionality of the new standard are particularly well-suited to advance the public safety work of public television stations. For example, the NextGen TV standard will enable enhanced geo-targeting of alerts and could provide comprehensive auxiliary data, such as evacuation routes and weather maps. The standard also allows broadcasters to "wake up" receiver devices when an emergency alert is

transmitted, facilitating the dissemination of critical information, particularly at night, when severe weather or other emergencies may occur.

The FCC's Communications, Security, Reliability and Interoperability Council's (CSRIC) Working Group 2 June 2018 final report on "Comprehensive Re-imaging of Emergency Alerting" identifies three ways NextGen TV, and specifically public television, can support and improve emergency alerting. Section 6.4 of the Report provides an example of how a public television station can use the new broadcast standard to improve emergency alerting:

> "NextGen TV: Saving Lives One Alert at a Time, UNC-TV (North Carolina) won first place in the National Association of Broadcasters (NAB) Pilot Innovation Challenge for a proposal that uses datacasting technology in broadcast television to update outdated first responder emergency pagers. Initial tests show the potential to decrease a fire station's time to respond to a given alert by nearly one minute for each notification. The project currently uses ATSC 1.0 to reach fire stations across the state. Once ATSC 3.0 broadcasting is implemented, updated receivers connected to mobile devices will allow mobile paging for first responders, even in areas where LTE service does not reliably reach."

In August 2021, PBS North Carolina, the North Carolina Department of Information Technology (NCDIT)'s FirstTech program, and Device Solutions Inc. were awarded a Small Business Innovation Research grant by DHS to continue the development of a new emergency digital paging system over public television. The emergency digital paging system utilizes digital ATSC 3.0 TV technology to deliver an affordable paging structure to improve situational awareness and response time for first responders across the state of North Carolina. The system will help first responders with increased coverage area and penetration, reduce delay, and provide a secure and reliable means for transmitting emergency alerts. Chief Technology Officer at PBS North Carolina, Fred Engel, notes, "This award allows us to continue to explore the many other capabilities of this technology that will serve the public, starting with emergency communications."

NextGen TV technology could also allow public broadcasters to better serve those who are hearing and visually impaired. For the first time, stations could transmit closed caption sign language alongside their broadcasts to provide a more complete experience for hearing impaired viewers. Further, the system would be able to provide greater dialogue intelligibility by allowing users to independently adjust the non-dialogue elements of a program's audio track. In addition, closed captions and subtitles could be offered in multiple languages and could transmit through either broadcast or broadband.

For public television to provide these enhanced alerting services, stations must make a costly technology transition. A January 2018 report prepared for CPB by Meintel, Sgrignoli and Wallace, states, "As with any new technology migration, there will be a need to acquire new equipment and integrate that new equipment into an existing operational TV broadcast plan." A variety of new technologies are being adopted in ATSC 3.0 that are not "backward-compatible" with existing infrastructure at a "typical" TV station. Advanced Television Systems Committee Inc. reports that it will cost a station between $300,000 and $4 million to transition to the new broadcast standard, depending on the station's current infrastructure. This broad range of potential costs depends on how new various station equipment is and if it can be easily updated

for ATSC 3.0. Unfortunately, many public television stations have been forced to push their infrastructure and equipment beyond its optimal end of life due to financial uncertainties. As a result, the upgrade to ATSC 3.0 may be on the higher end of this range.

The Next Generation Warning System (NGWS) will enable the expansion and enhance the reliability of the alert, warning, and interoperable communications activities that public broadcasting stations are committed to, while providing first responders and public safety officials with critical new communication resources.

FY 2023 PROPOSED APPROPRIATIONS LANGUAGE

Federal Funds
DEPARTMENT OF HOMELAND SECURITY- FEMA, OPERATIONS AND SUPPORT
Of the amounts made available to the Department of Homeland Security Operations and Support account for fiscal year 2023, $40,000,000 for the Next Generation Warning System as part of the Emergency Alert System.

Budget Language
Next Generation Warning System- This recommendation includes $40,000,000 for the Next Generation Warning System as part of the Integrated Public Alert and Warning System. The Committee expects FEMA to work with the Corporation for Public Broadcasting to implement this program for public broadcasting entities, as defined by 47 USC 397(11).

Appendix A

Highlights of Public Television and Public Radio Equipment Needs[11]

Alabama Public Television	
6 Antenna with V Pol and interim antennas	$4,000,000
Whole House UPS for 5 Transmitter sites	$700,000
Datacasting equipment for each transmitter site	$450,000
	TOTAL: $5,150,000
Alabama- WBHM-FM (Birmingham)	
Standby EAS unit-SAGE	$4,000
Backup RDS Encoder	$1,100
External Antennas for Monitoring Stations	$400
Public Service Radio Monitors	$800
Auxiliary Transmitter	$70,000
	TOTAL: $76,300
Alaska- KCAW-FM (Sitka)	
3 Backup Generators	$21,000
Studio Transmission Lines (STL)	$62,000
HVAC for Cable House	$25,000
Codec Replacements	$10,000
Tower Facility Enclosure	$38,000
Antenna Replacement	$4,500
FM/AM Transmitter/Translator Replacement	$213,800
	TOTAL: $374,300
Alaska- KUAC-TV/FM (Fairbanks)	
TV Transmitter	$250,000
Uninterruptable Power Supply (UPS)	$150,000
IP Network Site Transmission Line (STL)	$100,000
Back-up STL & Network for Transmitter Remote Control for TV & FM	$6,000
	TOTAL: $506,000
Alaska- KOTZ-AM, KINU-FM (Kotzebue)	
1 FM Transmitter	$20,000
HVAC Replacement	$20,000
Power over Ethernet (PoE) Switchers	$7,500
Computer Replacement	$5,000
	TOTAL: $52,500
Alaska- KUCB-FM (Unalaska)	
Network rewire and router replacement	$15,000
Alaska- KNBA-FM (Anchorage)	
Streaming encoder replacements	$15,000

[11] This is just a sample of critical local public broadcast station needs as of 2021. It is not intended to be an exhaustive list.

Alaska- KHNS-FM (Haines and Skagway)

Transmitter	$15,000
Remote Pickup Unit (RPU)	$10,000
UPS replacement	$1,000
2 Codecs	$4,000
Firewall switcher	$1,500
	TOTAL: $21,500

Arizona- KJZZ and KBAQ Public Radio (Tempe)

Transmission Site Generators and UPS	$18,000
STL and TX Distribution Networks	$160,000
Translators/Single Frequency Network	$50,000
Other RF Broadcast (replace BPF)	$160,000
Cybersecurity Software	$30,000
Station Generator and Uninterruptible Power Supply	$20,000
Other Common Infrastructure	$120,000
	TOTAL: $558,000

Arizona PBS (Phoenix)

Routing Switcher	$1,248,000
Production switchers	$678,000
Transmitter	$350,000
8 Translators	$280,000
	TOTAL: $2,556,000

California- Public Media Group of Southern California

2 TV Back Up Transmitters - Mt. Wilson	$850,000
2 TV Back Up Antennas - Mt. Wilson	$350,000
HVAC System Replacement Mt. Wilson	$650,000
Fire Suppression System Mt Wilson	$550,000
UV/HEPA/Ion Virus Filtering HVAC Upgrades (Studio/Offices)	$750,000
2 TV Receiver/Antenna/Synchronization Equipment	$90,000
4 TV Translator Transmitters	$450,000
4 TV Translator Antennas	$385,000
4 TV Translator Encoders	$200,000
5 TV Receiver/IRD	$20,000
5 IP Microwave Links (Mt Wilson and Translator Network)	$350,000
2 Routing Remote Access	$140,000
Satellite Receive/Uplink Antennas	$350,000
CAL Office of Emergency Services	$50,000
NextGen TV Test and Monitoring Equipment	$200,000
NextGen TV DA and Modular Equipment	$100,000
2 NextGen TV EAS Encoders	$25,000
Network Interfaces (Network, Routers, etc.)	$250,000
2 TV Encoding Systems KOCE and KCET	$600,000
Cabling, Racks, Mounting Hardware	$60,000
GPU-Accelerated Enterprise Transcoding Server	$40,000
UX Testing / QA / Demo Hardware	$12,000

2 Streaming encoders	$100,000
	TOTAL: $6,572,000
Colorado- Rocky Mountain Public Media	
10 Translators	$60,000
CAT DV Archiving System	$102,000
KTSC Raydom Replacement	$37,000
The Drop Replacement Transmitter	$9,000
2 IT Switch Catalyst 9300 48-port UPOE	$16,000
Portable HD/SDI Test Generator & Monitor	$5,000
KUVO DROP & JAZZ Phone System	$12,000
Rooftop Network Infrastructure Buildout	$7,000
KRMA/KTSC/KRMJ/KRMU MPEG and RF Analyzer Replacements	$62,000
Vidcheck Module for Vantage	$16,000
Masterpiece Teleconference	$30,000
	TOTAL: $356,000
Connecticut Public Media	
7 Uninterruptible Power Sources (UPS)	$35,000
WEDN-TV Transmitter	$365,000
WPKT-FM Radio Transmitter and Antenna	$80,000
WRLI-FM Radio Transmitter and Transmission Line Replacement	$80,000
WRLI Backup Generator	$100,000
WEDW Backup Generator	$100,000
Microwave Transmission System	$250,000
	TOTAL: $1,010,000
Florida- WEFS-TV (Cocoa)	
Cocoa Tower Anchor and Guide Cable Reinforcement	$132,000
Tower, Satellite Downlinks, Broadcast Equipment Grounding & Lightning Protection	$50,000
Transmission Chain Update	$375,000
Studio to Transmitter Link (STL)	$100,000
Station UPS	$70,000
Router (Multi-viewer)	$45,000
	TOTAL: $772,000
Florida- WUFT-TV, WUFT-FM, WJUF-FM (Gainesville)	
WUFT-TV Transmitter, line, and antenna	$1,500,000
WUFT-TV/FM STL Equipment (transmitter/receiver)	$200,000
WUFT-TV House Sync Generator	$18,000
House UPS	$233,300
WUFT-FM Transmitter	$80,000
HD Modulation Monitor	$9,000
WJUF-FM Transmitter	$80,000
	TOTAL: $2,120,000
Florida- WJCT-TV (Jacksonville)	
Studio Building Backup Generator	$160,000
Studio Building UPS	$120,000

Transmitter Site Backup Generator	$80,000
Transmitter Site UPS	$60,000
Transmission Chain Update (Encoding, EAS, WARN)	$485,000
IP Studio-Transmitter Link (STL)	$15,000
Importer/Exporter	$20,000
FM Axia Nodes	$25,000
ENCO Radio Automation	$30,000
	TOTAL: $995,000
Florida- WFSU Public Media (Tallahassee)	
Transmitter and Antenna Replacement for WFSU-TV	$1,700,000
Broadcast Operations Equipment Update (Encoding, EAS, WARN)	$470,000
Replacement of Fuel Tank for Back-up Generator	$50,000
	TOTAL: $2,200,000
Florida- WEDU Public Media (Tampa)	
Transmission Chain Update (Encoding, EAS)	$495,000
Transmitter	$300,000
Dialectric Antenna	$300,000
Monitoring System	$20,000
UPS	$100,000
Updated Generator	$700,000
Tower Repairs	$200,000
	TOTAL: $2,115,000
Georgia- Public Broadcasting Atlanta	
Backup Audio processing for FM/HD	$75,000
Automation System Hardening – Backup and Servers	$150,000
GHZ Microwave transmission line replacement	$400,000
Microwave replacement	$300,000
Solid State FM/HD transmitter	$250,000
TV and audio control room	$1,000,000
UPS System	$200,000
Transmitter Site Coax Switch	$150,000
IT infrastructure upgrade/hardening/security	$165,000
Azure storage for TV/Digital	$200,000
News automation software/hardware	$125,000
	TOTAL: $3,015,00
Hawaii PBS	
KHET Transmitter	$170,000
KMEB Transmitter	$170,000
KHET Antenna System	$470,000
KMEB Antenna System	$570,000
Station Networking Infrastructure	$300,000
	TOTAL: $1,680,000
Hawaii- KKCR-FM (Kauaʻi)	
Backup emergency Generator, Transfer Switch, Electrical	$20,000
FM transmitter	$20,000

FM broadcast Antenna	$20,000
Digital Audio consoles	$25,000
UPS Backup Power	$12,000
Inter-Island Microwave System	$20,000
	TOTAL: $137,000

Idaho Public Television

4 Transmitters (Dual Exciter)	$1,400,000
4 Antennas	$1,000,000
4 Installations	$200,000
4 Transmission lines	$154,000
4 Duplex Studio Transmission Lines	$360,000
Delivery & Signaling Server	$15,000
5 IP Gateway Devices	$59,500
Virtualized Modulator/IP Switches	$25,000
Encoding Plant Upgrade	$30,000
File Server Upgrades	$250,000
5 Test Monitoring Sets	$250,000
46 Transcoder Front Ends for Translators	$825,000
	TOTAL: $4,318,500

Idaho- Boise State Public Radio (KBSU-FM, KBSW, KBSX)

<u>Generators, Backup power</u>

YFRP Generator, Transfer Switch, Electrical	$95,000
UPS for SMASH Downlink	$2,500
240v UPS for KBSK, KBSQ, KBSM, battery bank	$7,500
KBSW Generator	$25,000
2 Generators, UPS, Transfer switches	$45,000
Salmon, Challis UPS & Battery runtime improvements	$6,000
Stanley School UPS, Generator	$15,000
2 Uninterruptable Power Sources (UPS)	$5,000
Ketchum School UPS	$2,000

<u>Emergency messaging and availability</u>

EAS Endecs, receivers, route to air for KBSK, KBSQ, KBSM	$15,000
Enhanced RDS and HD Alert messaging on KBSK, KBSQ, KBSM	$32,200
EAS audio from Elko to KBSJ	$5,300
Salmon coverage update, HD enabled, full messaging and alerting	$91,650
Challis coverage update, HD enabled, full messaging and alerting	$91,650
Cambridge transmitter, antenna, receiver replacement	$19,000
Cascade School - transmitter, receiver	$19,000
Stanley Coverage & alert messaging improvements, HD Alerts, MetaPub	$131,200
Ketchum School program feed	$5,500
KBSS Main Transmitter, Antennas, Filter, HD Alerts, MetaPub	$96,300
KBSW HD Alerting	$13,000
KBSJ Transmitter, Coverage upgrade, HD Alerts, MetaPub	$133,500
KBSW Coverage improvement	$166,000

KBSU, KBSX aux site w/ coverage improvement on KBSX	$566,300
3 Studio Transmission Lines (STL)	$96,000
2 coverage replacement boosters	$120,000
Other common infrastructure	$80,158
TOTAL	$1,879,758
Illinois Public Media WILL-FM and WILL-TV (Urbana)	
FM Transmitter	$90,000
FM Studio Transmission Line (STL)	$35,000
FM Transmission Antenna	$350,000
TV Transmitter	$181,000
TV STL	$45,500
TV Transmission Antenna	$900,000
Transmission Chain Update	$450,000
TOTAL:	$2,051,500
Indiana- WFYI-TV and WFYI-FM (Indianapolis)	
15Kw Transmitter and 2 Exciters	$600,000
FM Antenna	$35,000
FM Backup Transmission Antenna	$12,000
FM Backup Transmission 200’ Tower Renovation	$20,000
Transmitter Roof	$82,000
800’ Tower Painting	$70,000
Refurbish Radio Control Rooms	$60,000
FM Automation	$30,000
Power Generator and Transfer Switch	$200,000
Building Modifications to support new generator	$15,000
Terminal Equipment	$15,000
TV Router	$80,000
Network Refresh	$125,000
TOTAL:	$1,344,000
Iowa Public Radio	
1 Transmitter, Transmission Line and Antenna, WOI-FM	$875,000
1 Transmission Line and Studio to Transmitter Link, KSUI-FM	$325,000
TOTAL:	$1,200,000
Kansas – PBS Kansas (Wichita)	
Transmitter, Park City	$2,025,000
Transmitter, Hutchinson	$2,025,000
Router	$69,000
Encoder	$25,000
Encoder/Decoder	$4,000
Microwave	$35,000
Exalt PS & Surge Suppressors	$1,500
Gateway/Firewall	$2,500
Network Storage Solution	$12,500
TOTAL:	$4,199,500

Kentucky Educational Television (KET)

Localized EAS system on 16-station statewide network	$1,500,000
FirstNet Air-to-Ground video over datacast on statewide network	$4,345,000
Transmitter site (16 stations) emergency power, HVAC, tower lighting	$4,063,000
Network Operations Center emergency power, HVAC, security	$1,963,080
Statewide network transmission site expansion to increase rural access	$12,000,000
Studio to transmitter link/broadcast chain (16 stations)	$11,500,000
TOTAL:	$35,371,080

Kentucky- Louisville Public Media

New generator at Station	$75,000
New generator at Tower	$75,000
Uninterruptible Power Source at Tower	$60,000
Replace Studio Transmission Line (STL)	$20,000
Music Station Collaboration Hardware	$20,000
TOTAL:	$250,000

Kentucky- WKMS-FM (Murray)

Back Up Transmitter	$75,000
Studio Transmission Link (STL)	$10,000
4 Number EAS Units	$10,780
2 RDS Units	$4,780
Mobile Backup Studio	$100,000
1 Generator	$40,000
TOTAL:	$240,560

Louisiana- WYES-TV (New Orleans)

Transmitter	$1,573,145
Antenna with V polarization	$566,000
Antenna Installation	$280,000
Transmitter Remote Control	$32,700
Redundant Encoder	$350,000
Hot Stand-by Studio to Transmitter Link	$69,615
Tower Strengthening	$100,000
TOTAL:	$2,971,460

Louisiana- WWNO-FM and WRKF-FM (New Orleans and Baton Rouge)

<u>WWNO</u>

Backup generator	$125,000
Studio Transmission Line (STL)	$30,000
Uninterruptable Power Supply (UPS)	$12,000
Backup Climate Control Studio	$60,000
EAS Encoder for Transmitter Site	$5,000
Portable Satellite Downlink System (Shared with WRKF-FM)	$40,000
Satellite Receivers	$15,000
KTLN Backup Generator	$30,000
Codecs (two pairs)	$30,000
Backup Internet Equipment	$10,000

Metapub improvements	$10,000
Digital Online Infrastructure	$10,000
Weather Equipment (FPREN)	$50,000
Backup Studio at Office of Emergency Management- shared	$250,000
	TOTAL: $677,000

WRKF

Backup generator	$100,000
Studio Transmission Link (STL)	$30,000
Uninterruptable Power Supply (UPS)	$12,000
Backup climate control studio	$10,000
EAS Encoder for Transmitter Site	$5,000
Satellite Receivers	$15,000
Codecs (two pairs)	$20,000
Backup Internet Equipment	$10,000
MetaPub Improvements	$10,000
Digital Online Infrastructure	$10,000
Weather Equipment (FPREN)	$50,000
	TOTAL: $297,000

Maryland Public Television

12 Exciter upgrades to NextGen TV	$90,000
18 Microwave Distribution upgrades	$180,000
3 Fiber Modems	$30,000
4 A/V Encoding / Statmux	$160,000
1 Route Signaling / Announcement	$35,000
5 Integration, rack and cabling	$25,000
Integration, rack and cabling for MPT Studios	$20,000
	TOTAL: $540,000

Maryland- WYPR-FM (Baltimore)

Replacement Transmitter	$136,000
Studio Generator	$100,000
Transmitter and Generator	$75,000
New Microwave Links to WYPR	$20,000
3 Audio Over IP Encoders/Decoders	$13,617
10 KVA UPS	$10,000
Updated HD equipment for enhanced meta data and datacasting	$20,500
New routing system and consoles	$212,173
Telos Studio Phone VOIP System	$8,563
XTRM Site Air Conditioning	$5,900
	TOTAL: $601,753

Mississippi Public Broadcasting

6 Tower Maintenance and Repair to meet current standards	$3,420,000
5 DTV transmitters	$4,180,000
8 FM Transmitters	$1,600,000
18 Emergency Generators (8 Tower, 10 Microwave)	$970,000
5 (sets) high intensity LED tower lights (Tower Site)	$1,200,000
11 (sets) medium intensity LED tower light systems (Microwave)	$880,000

7 HDFM antennas	$997,000
8 LAN switches	$32,000
1 Digital Television Analyzer	$80,000
8 Elevator inspection and repair at tower sites	$400,000
3 Monitor DTV/Radio transport signal	$15,000
19 Microwave Link Equipment	$2,000,000
2 Waveguide Transmission Lines	$20,000
1 UPS	$120,000
1 Monitoring and Media On Air Equipment	$50,000
1 DTV/FM Audio Compliance Monitoring	$15,000
	TOTAL: $15,979,000

Missouri- KCPT Public Television (Kansas City)

NextGen TV Transmitter	$2,200,000
Antenna with 30% Vertical Polarization	$750,000
Studio Transmitter Link (STL)	$100,000
Testing and Monitoring Equipment	$50,000
	TOTAL: $3,100,000

Missouri- St. Louis Public Radio

3 HD Transmitters	$413,800
FM antenna and transmission line	$280,000
HVAC units for transmitter sites	$150,000
	TOTAL: $843,800

Montana PBS

Routing and distribution, additional services within Network Operations Center	$75,000
HEVC encoders and licensing	$250,000
ATSC 3.0 Broadcast Gateway	$75,000
ATSC 3.0 System Manager	$50,000
ATSC 3.0 Emergency Alerting	$25,000
Mask Filters	$40,000
Replacement of all non-IP microwave links	$240,000
Replacement of KUFM-TV Missoula transmitter and antenna	$250,000
Replacement of KBGS-TV Billings transmitter and antenna	$250,000
Replacement of KUHM-TV Helena antenna	$100,000
Replacement of KUGF-TV Great Falls transmitter	$150,000
Replacement of KUKL-TV transmitter	$120,000
Network Operations Center equipment replacements	$100,000
Test and Monitoring equipment	$75,000
KUSM-TV NOC Emergency Generator and UPS	$250,000
Microwave site emergency generators	$150,000
Systems Integration	$100,000
	TOTAL: $2,400,000

<u>Enhanced Public Safety Infrastructure</u>

Montana Department of Emergency Services interconnection	$75,000
Facilities hardening	$150,000
Mobile communications from remote incidents	$50,000

Origination, routing, distribution, storage/encoding equipment for improvement of Montana Public Affairs (MPAN)	$200,000
Signal expansion in unserved communities (Lewistown, Miles City, Glendive, Dillon)	$400,000
	TOTAL: $875,000
New Hampshire Public Television	
Live captioning system for studio	$10,000
Master Clock system for broadcast	$33,000
Replacement UPS for studio	$60,000
Replace a/c for master control	$60,000
Transmitter Saddleback	$500,000
Transmitter Hanover	$162,000
Burke hardware/software to replace ILC system	$70,000
Replace Main Tower	$1,500,00
	TOTAL: $2,445,270
New Jersey- WBGO-FM (Newark)	
VoIP Phones System Conversion	$11,000
Update Studio Consoles	$280,000
Update of IT Infrastructure Servers & Security	$70,000
Update of IT Infrastructure Network Switches	$45,000
4 IP Codecs	$25,000
Automation System Replacement	$40,000
2 On Air Audio Processing Replacement	$25,000
HD Radio Exporter / Importer Replacement	$35,000
Replacement Backup HD Transmitter	$125,000
2 Backup STL for both Transmitter Sites	$10,000
Miscellaneous Hardware, Cables, Connectors	$25,000
	TOTAL: $691,000
New Mexico- KRWG TV and KRWG FM (Las Cruces)	
15 Uninterruptible Power Supplies (UPS)	$27,000
9 Uninterruptible Power Supplies (UPS)	$16,000
1 Generator, Transfer Switch	$400,000
1 Generator, Transfer Switch	$250,000
1 Generator, Transfer Switch	$150,000
1 Generator, Transfer Switch	$150,000
2 Compliance-Monitoring	$65,000
7 Compliance-Monitoring	$120,000
1 Main Transmitter \Change over switch	$150,000
1 Audio Board	$75,000
1 Audio processor	$10,000
1 Back-up EAS SAGE	$4,000
1 RDS Encoder	$3,000
1 FM Automation	$30,000
1 Tower LED Lighting	$15,000
1 HVAC unit	$250,000

1 Microwave STL	$45,000
1 New HVAC	$250,000
1 Partition room for new HVAC system	$10,000
1 Replace Electrical feedline to building	$20,000
1 Signal Analyzing Equipment	$60,000
3 Transmitters CrownFM30	$12,000
1 Transmitters CrownFM600	$9,000
1 Transmitters Crown FM250	$7,000
	TOTAL: $2,128,000

New York Public Radio

Upgrade and modernize on-air delivery system for remote use	$1,155,000
Upgrade Microwave STL to auxiliary transmitter site	$146,750
Replace failed, unlicensed microwave STL to main transmitter site	$181,160
Replace wireless intercom system	$67,000
Replace auxiliary transmitter site for WNYC-FM and WQXR	$262,000
1 new generator for WNJP-FM transmitter site	$50,000
Upgrade audio routing and mixing platform	$2,100,000
	TOTAL: $3,961,910

PBS North Carolina (UNC-TV)

14 Primary Uninterruptable Power Supply (UPS)	$8,076,173
14 Primary Emergency Power Generators	$3,822,967
13 Redundant Emergency Power Generators	$4,253,205
Microwave System Replacement (All 50+ Sites)	$2,839,568
Fiber to transmitters (Full power sites)	$662,131
	TOTAL: $19,654,044

North Dakota Public Media (Prairie Public)

Microwave Intercity System Pkg	$4,750,000
Studio Transmitter Line (STL)	$100,000
9 Television Transmitter Pkg	$3,150,000
10 Radio Transmitter Pkg	$3,000,000
Generator	$200,000
	TOTAL: $11,200,000

Oklahoma Public Television (OETA)

Transmitter Replacement (Eufaula, OK)	$950,000
Transmitter and Transmission Line Replacement (KOED - Tulsa, OK)	$1,750,000
LPTV Sites - transmitter replacement - Qty 13 (OK Statewide Locations)	$780,000
HVAC Replacement – Qty 5 (KETA - OKC, OK)	$250,000
Media Archive Server (KETA - OKC, OK)	$32,000
NOC Facility Upgrades (KETA – OKC, OK)	$150,000
Avid System Upgrade (KETA – OKC, OK)	$110,000
4.5M satellite downlink (KETA – OKC, OK)	$27,000
	TOTAL: $4,049,000

Oklahoma- KOSU-KOSR-KOSN-FM (Oklahoma City/Stillwater/Nowata)

2 Studio Transmitter Link (STL) KOSU	$45,000

FM Exciter for KOSU	$9,000
Audio Processor for KOSU	$9,000
Air Conditioner for KOSU transmitter building	$20,000
Generator replacement for KOSU	$30,000
Pre-cast concrete transmitter building for KOSN	$75,000
FM Transmitter for KOSN	$140,000
FM Transmitter for KOSU	$140,000
Tower Plumb and Re-tension KOSU and KOSN	$16,000
Double Conversion Backup Power Supplies KOSU Studio	$8,800
Comrex Access Multirack Studio Codec	$5,000
Tieline Gateway Studio Codec	$6,300
Portable Emergency Transmitter	$20,000
LED tower light upgrade KOSU	$187,000
LED tower light upgrade KOSN	$160,000
Natural Gas generator for KOSR (20kW)	$25,000
Air Conditioner for Stillwater tower site	$7,000
TOTAL:	$903,100

Oklahoma- KGOU-FM (Norman)

Studio and transmitter power generators (3)	$135,000
Exciters (2)	$18,000
Broadcast Microwave System	$6,500
Transmitter monitoring/remote control for Norman auxiliary transmitter	$1,200
Studio Consoles with Nodes (2)	$28,000
Backup broadcast and digital studio (remote/offsite)	$75,000
Backup A/C for main studio	$15,000
Portable Emergency Transmitter	$15,000
Upgrade and relocate Norman auxiliary transmitter (offsite)	$25,000
TOTAL:	$318,700

Utah- KRCL-FM (Salt Lake City)

Transmitter replacements	$80,000
Digital on-air console board	$100,000
Microwave link	$5,000
TOTAL:	$185,000

Vermont PBS

2 Transmitters	$300,000
4 Uninterrupted Power Supply (UPS)	$1,250,000
5 Microwaves	$351,000
1 Repeater Microwave	$40,000
4 Transfer Switches	$48,000
3 HVACs	$90,000
TOTAL:	$2,079,000

Vermont Public Radio

WVBA Transmission Equipment	$49,000
WVXR Transmission Equipment	$25,000
WBTN-FM Tower Lighting Replacement	$20,000

Rupurt and Newbury Translator Transmission Equipment	$15,000
WVPS, WOXR, WVTQ Studio to Transmitter Link Replacement	$65,000
WVTX Transmission Equipment	$7,500
	TOTAL: $181,500
Washington- KBTC Public Television (Tacoma)	
Transmitters – Full Power with redundant exciters and drivers	$1,625,000
Antennas – Circular Polarized	$535,000
Transmission Line	$273,000
Generators	$900,000
UPS Systems	$150,000
Test and Compliance Monitoring	$205,000
Encoding	$250,000
Studio Transmission Line (STL)	$375,000
Remote Control	$75,000
Tower Lighting	$55,000
	TOTAL: $4,443,000
West Virginia Public Media	
5 Antennas and 5 Translators	$2,200,000
	TOTAL: $2,200,000
Wisconsin- Milwaukee PBS	
Station Facility Backup Generator	$250,000
Station Facility UPS	$120,000
Station Facility Power Distribution	$55,000
Broadcast Transmission Chair Update	$495,000
	TOTAL: $920,000
Wisconsin Public Radio- WERN, WHAD, WHA and WLSU	
23 Transmitters	$1,995,000
8 Generators	$1,400,000
19 Uninterruptable Power Supplies (UPS)	$95,000
10 Antennas	$890,000
14 Studio Transmission Lines (STL)	$600,000
	TOTAL: $6,565,000
Wisconsin Public Television- WHLA, WPNE, WHA, WHRM, WLEF and WHWC	
1 Transmitter	$300,000
2 Generators	$600,000
1 UPS	$80,000
5 STL	$1,500,000
	TOTAL: $2,480,000
Wyoming PBS	
1 Transmitter (Dual Exciter)	$350,000
2 Transmitter Upgrades	$260,000
3 Antennas	$300,000
3 Duplex Studio Transmission Lines	$270,000
Encoding Plant Upgrade	$30,000

36 Translators	$508,000
	TOTAL: $1,718,000
Wyoming Public Radio	
8, 10 kw transmitters	$430,400
5, 3.5 kw transmitters	$156,000
6, 1 kw transmitters	$47,400
6, 500kw transmitters	$39,600
22 Digital STL Link	$123,200
9 Digital Processors	$103,500
5 Backup Generators	$42,000
8 Low Power FM Antennas	$88,000
3, Medium Power FM Antennas	$87,000
2 FM Diplexers	$37,600
3 High Power FM Antennas and Combiners	$327,000
4 Low Power FM Antennas	$64,000
	TOTAL: $1,115,300