

# Understanding IPAWS



## Mission Critical Knowledge

[IPAWS](#) is “FEMA’s national system for local alerting. It gives federal, state, local, tribal, and territorial public safety agencies the ability to send WEAs, EAS alerts, weather and non-weather-related emergency messages simultaneously through NOAA weather radios, and alerts through systems like sirens and digital billboards.” It’s one of the most powerful tools to help government officials keep their communities informed and safe.

A thorough understanding of IPAWS is an essential element for making the right decision to send an alert.

Through IPAWS, local alerting authorities can send out their own targeted emergency alerts to make sure only impacted individuals receive the message.

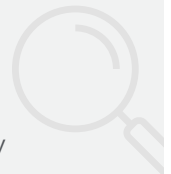
### Official Alerts Versus IPAWS Alerting

Official alerts exist in every state, and they’re becoming more and more common. The AMBER Alert, Silver Alert, Blue Alert, Gold Alert, Golden Alert, Purple Alert and Feather Alert are a few examples. There are dozens more.

Each of these alerts are designed to accomplish a specific task with a dedicated process and resources. One of the common misconceptions is that these alerts and IPAWS are the same. IPAWS is the keeper and developer of tools of alerting and although mentioned in each of the above examples of official alerts, it is not tied down or restricted to being used in only official alerting. Alerting authorities have the authority to send alerts, warnings and notifications outside of official alerting as they deem appropriate.

#### Real-world scenario

A missing 6-year-old girl with a cognitive impairment ran away from a park and has not been located. Nightfall and freezing temperatures are approaching and the exigency for her recovery is extremely high. The alerting authority may be restricted by legislative regulations to not call this an AMBER Alert because there is no sign of an abduction. However, the need to immediately find her still exists. There are no Federal restrictions limiting IPAWS alerting by the local jurisdiction in this situation, even if it is not an official alert.



## Opt-in Alerting

Opt-in alerting occurs when community members sign up for alerts through an application. This is an internal alerting function and does not interact with IPAWS. Opt-in alerting has potential additional capabilities to send pictures, maps and videos. IPAWS does not have those capabilities.

## Opt-out Alerting

IPAWS messaging is an opt-out system that presumes everyone in the activation area needs the information. If a person does not want the information, they can opt out. It has limited capabilities. It is text only and cannot send pictures, maps or videos.

## The 3 IPAWS Alert Pathways

### 1 Emergency Alert System (EAS)

- These messages are mostly for television and radio broadcast transmission.
- They can be delivered in two languages. English is required. Spanish is optional. A single message can include both English and Spanish at the same time, but only one language is delivered once depending upon the device settings.
- For both radio and TV, the message should contain no more than 1,600 characters per the Federal Communications Commission, although IPAWS does not currently validate or limit this character limit. However, a future release of IPAWS will likely enforce this restriction.
- There are four ways to include an audio “mimetype” in an EAS message. (*Note: See Continuing Education for specifics.*) If broadcast content exceeds two minutes playing time it may be truncated by exchange partners except for Presidential Messages.
- For TV, as the audio announcement plays, the written message will also crawl across the screen, typically twice. However, there may be some variation since broadcast stations are all voluntary and have different capabilities.
- During live IPAWS testing, use one of the following event codes: Required Weekly Test (RWT), Required Monthly Test (RMT) or Practice/Demo (DMO). It is very important to use the correct codes when testing because all sent messages are processed. So even test messages will be transmitted, but the receivers will know not to continue the distribution based on the test codes.

### 2 Wireless Emergency Alert (WEA)

- These messages are sent to cell phones and other WEA capable devices via push broadcast through cellular service towers. Push broadcasts will still be delivered even when regular text messages and phone calls over wireless devices are jammed.
- Per the FCC, [97 percent of households](#) in the U.S. have a WEA capable device.

- Messages in English are required. Spanish is optional. Alerting Officials (AOs) can and should send Common Alerting Protocol (CAP) messages in both languages. Only one language is delivered to the user depending on the hardware settings. AOs can include as many “info” blocks as they want, but only the first English and first Spanish block will be transmitted.
- Ninety characters is mandatory, while 360 characters is optional, included in a single message. Only one message is displayed depending on the user device capabilities (i.e., WEA 1.0, WEA 2.0 or WEA 3.). A message with more than 90 or 360 characters will be rejected.
- Certain special characters may count as more than one character. Embedded URLs and links also count toward the character count.
- The best practice is to use 360 characters to create an effective message, but it must include the required 90-character CMAM text. If you have the capabilities to also send a Spanish language message, you should do it too.
- If a message includes any of the following special characters, it will be rejected: “{”, “}”, “|”, “\”, “^”, “~”, “[”, “]”.
- Attachments are not allowed with a CAP message. However, AOs can embed links into the CMAM text. Hyperlinks are not vetted or verified for accuracy or uptime.
- Delivery is based on the recipient’s geographic location (proximity to a cell tower). The cellular providers determine when and where notifications are received, so make sure to contact those providers to determine range distribution and geographic overlap parameters. Each provider has different policies for WEA.
- Federal Information Processing Standards (FIPS) is always required. A polygon or circle is optional. A message without a FIPS (geocode) and Area Description will be rejected. FIPS code and polygon use must match the AO permissions. If a polygon is included, it must include less than 10 shapes or 100 total nodes.
- “Cancel” will stop an active push broadcast.
- “Update” will cancel an active alert and send a new one.

### 3 NOAA Weather Radio (NWR — Formerly known as NWEM)

- These messages run on radio frequencies outside the normal AM or FM broadcast bands.
- Agencies should not include supplementary audio clips.
- Messages are required in English. Spanish is optional, but it is ignored.
- Your WFO will review and edit each message to conform to the National Oceanic and Atmospheric Administration (NOAA) text-to-speech standards. Therefore, these alerts will be delayed until that process is completed by human interaction.

- To enable NWR broadcast, the National Weather Service (NWS) must first generate a World Meteorological Organization (WMO) teletype style formatted version of the alert and transmit it to NWS offices via the NOAAPORT. NOAAPORT is also monitored by many third parties who may also redistribute the alert.
- Correct population of the “senderName” element is important because NWS populates the alert text broadcast over NWR and other NWS dissemination systems with information from the “senderName” element. This is done to ensure proper attribution and clarity in the alert message. NWS makes a clear distinction between the alerting authority generating the alert and the alerting authority requesting the alert, which are not always the same.
- NWR does not accept circles and limits polygons to 20 nodes.
- Updates are not handled as emergencies. The best practice is to update the original message to stop the retransmission of the original.

The owner of the program should regularly check FEMA's site for [monthly information tips](#) for changes to the pathways, update documentation and educate all users accordingly.

## Your State Emergency Alert System (EAS) Plan

The Emergency Alert System (EAS) is a national public warning system that requires TV and radio broadcasters to offer the President the communications capability to address the American public during a national emergency. The system also may be used by state and local authorities to deliver important emergency information such as AMBER (missing children) alerts and emergency weather information targeted to a specific area.

The EAS plan allows authorized authorities to promptly distribute important local emergency information. Being an emergency manager overseeing the initiation of alerts in your local, county, tribal, territory or state is crucial for ensuring that the EAS plan aligns with the community's requirements.



## Understanding Your State EAS Backbone and Front End

Emergency officials need to understand how the systems within their state are connected. Technology changes quickly, so officials also need to remain aware of updates. All documentation should reflect changes, and the information pertaining to changes should be distributed to all individuals involved in the alert process.

Everyone involved in launching alerts also needs to be familiar with the front end of the system, including the required codes and protections in place. One example of a front end that's used by more than half of IPAWS alerting authorities is OnSolve CodeRED. It gives government agencies the ability to quickly and easily deploy IPAWS alerts during emergency situations.

Comfort and familiarity with the front end and how all systems are connected in your region is essential for building confidence during a crisis.

### Mindset Shift Reminder!

Every second counts during an emergency. A solid understanding of IPAWS removes the guesswork and builds confidence. The incidents below are just a few examples of “It Didn’t Have to Be This Way” moments. Let these serve as lessons in the importance of sending rapid, accurate and targeted alerts.

#### Ask yourself: What can we learn from past mistakes?

**Maui Wildfire:** By the time the county sent an emergency cellphone alert at 4:16 p.m., the fire had already been spreading through town. The alert did not cover all areas to which the wildfire soon spread. Death toll of at least 100 people.

**2021 Winter Storm Uri in Texas:** 246 people died. Reports of a “lack of coordination in disseminating messages to the public.”



# Continuing Education

## Advanced Tips: The 3 IPAWS Alert Pathways

### 1 Emergency Alert System (EAS)

- The four ways to include an audio “mimetype” in an EAS message are:
  - “audio/x-ipaws-audio-mp3”
  - “audio/x-ipaws-streaming-audio”
  - video/x-ipaws-video”
  - “video/x-ipaws-streaming-video”
- An error code is returned if the <url> element includes:
  - A missing http:// or https://
  - A missing period
  - A space
  - A “?”
  - A length exceeding 2,083 characters
- Only use FIPS codes. EAS does not recognize polygons.
- FIPS codes and Event codes are monitored by your Local Primary 1 (LPI) broadcasters. These are the lead stations in the alerting system.
- Your launch to IPAWS is not complete until you go back to your broadcasters and verify they’re monitoring for your FIPS codes and Event codes. Do NOT assume the LPI will automatically do so.

### 2 Wireless Emergency Alert (WEA)

- Polygons and Geographic Information System (GIS) overlays are restricted to 100 nodes.
- For live IPAWS testing, use Demonstration Message (DMO) handling code only.

### 3 NOAA Weather Radio (NWEM)

- You can identify a Requesting Agency for NWEM.
- Use FIPS codes only. NWEM does not integrate with maps at this time.
- For testing codes, check with your local WFO.



## Test Codes

FEMA's [IPAWS Best Practices Guide](#) provides important details about the three test codes available for the various IPAWS Alert Pathways. Some of the most important details are included below, but it is recommended to refer to the IPAWS guide for additional information.



### RMT — Required Monthly Test for EAS & WEA

- Typically prescheduled and coordinated state- or region-wide on an annual basis.
- Generally originate from a pre-designated local or state primary station or a state emergency management agency.
- Broadcast stations and cable channels must relay RMTs.
- They must be conducted between 8:30 a.m. and local sunset during odd numbered months, and between local sunset and 8:30 a.m. during even numbered months.
- Received monthly, tests must be retransmitted within 60 minutes of receipt.
- An RMT should not be scheduled or conducted during an event of great importance.
- Although RMT is available for WEA, it is not recommended for live testing. Rather, using RWT for WEA testing is the best option to avoid having to obtain an FCC Waiver.



### RWT — Required Weekly Test for EAS & WEA

- A test message that consists, at a minimum, of the header and end of message tones.
- RWTs are scheduled by the station on random days and times during weeks when there is no Required Monthly Test scheduled.
- Broadcast and cable operators generally do not relay incoming RWTs.
- EAS RWTs may originate from state and local alerting authorities to confirm the operational status of their IPAWS live alerting software configuration without interrupting broadcast or cable programming.
- Use RWT instead of RMT if the agency does not plan to interrupt the public.
- An FCC waiver is not needed when using test event codes for WEA. A waiver IS required to send live tests — using Event Codes other than RWT — to the public.
- Do NOT test WEA on a weekly basis. RWT is an Event Code type, not a mandate.
- Do not use Required Monthly Test (RMT) to conduct WEA tests because an RMT message will activate broadcast equipment and disrupt broadcasters' monthly test schedules if EAS distribution is accidentally selected.
- WEA tests will only be received on cellular devices that have opted to receive WEA test alerts.



## DMO — Practice/Demonstration Warning for EAS, WEA, & NWEM

- A DMO is a demonstration or test message used for purposes established in state, including local, tribal, or territorial EAS plans.
- NWEM does not support event codes RWT and RMT. Use DMO for testing NWEM.
- DMO can be used by authorized officials to test their NWEM capabilities or siren systems.
- Use RWT instead of DMO to test EAS/WEA and avoid disrupting the public.

## Deep Dive: Your State Emergency Alert System (EAS) Plan

The EAS plan provides guidelines for broadcasters, cable operators and all other EAS participants to determine:

- Mandated and optional monitoring assignments
- EAS codes to be used
- Guidance for message originators
- Other additional elements of the EAS which are unique to the state

A designated emergency manager can use the EAS to broadcast a warning from one or more major radio stations in a particular state. EAS equipment in other radio and television stations, as well as in cable television systems in that state, can automatically monitor and rebroadcast the warning.

Emphasizing the significance of these plans is essential to guaranteeing the proper transmission of emergency messages through EAS alerts to all intended recipients. This ensures that pertinent information reaches the public members who need to be informed about the triggering emergency situation.







## National Public Warning System (NPWS)

The National Public Warning System (NPWS) are radio broadcast stations located throughout the country with a direct connection to FEMA and strong transmission capabilities. Also known as Primary Entry Point (PEP) stations, they send emergency alert and warning information before, during and after an emergency or disaster.

The FEMA NPWS is the main source of initial broadcast for a national alert, and the NPWS can reach more than 90 percent of the U.S. population thanks to an increased number of PEP facilities.

While many officials may be unfamiliar with PEP stations, they're an important resource for continuity of government. Recent modernization began with the adoption of a new digital standard for distributing alert messages to broadcasters.

### Pro Tip

NPWS stations are equipped with back-up communications equipment and power generators designed to enable them to continue broadcasting information to the public during and after an event. If you haven't visited a PEP site listed in your State EAS Plan you should make a point to do so immediately to better understand its full capabilities.



### Recommended Reading

[FEMA — IPAWS Best Practices: Integrated Public Alerting & Warning System \(IPAWS\) Guidance and Techniques for Sending Successful Alerts, Warnings, and Notifications](#)