FEMA Integrated Public Alert & Warning System (IPAWS) 101

10:00 AM, Thursday, September 21, 2023

e-Learning

Texas Association of Regional Councils

UPCOMING EVENTS

GLO's Historically Underutilized Business (HUB) Program

September 27 @ 2:00 pm

Grant Ethics

October 4 @ 2:00 pm

joep@txregionalcouncil.org

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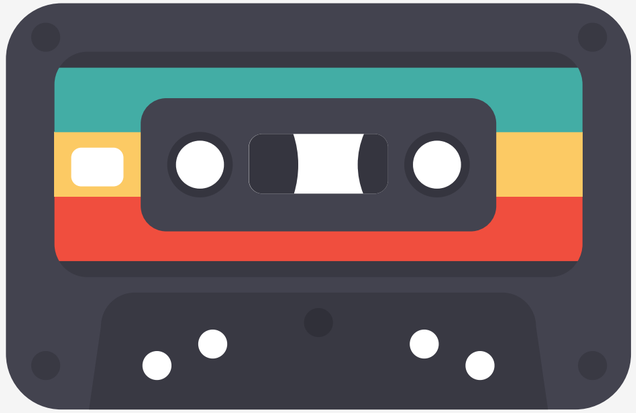
Texas Association of Regional Councils

HOUSEKEEPING

& REMINDERS



Recordings Available

Share Your Ideas

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LISTEN ONLY MODE

Share your thoughts and questions in the Chat!

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PRESENTER

ALFRED KENYON

Customer Support Branch Chief of the Integrated Public Alert & Warning System (IPAWS)
Federal Emergency Management Agency

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Texas Association of Regional Councils

IPAWS

Integrated Public Alert & Warning System

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IPAWS 101
An Overview

Al Kenyon, IPAWS Customer Support Branch Chief

What is IPAWS?

- Simply put -
  - IP-based enhancement to public alert and warning
  - An overlay for legacy Emergency Alert System (EAS) -- not replacement
  - Utilizes standardized, internationally-accepted language known as Common Alerting Protocol (CAP)
  - Goal: 1 alert to multiple communications pathways
- Components:
  - Emergency Alert System (EAS) = radio and television broadcast
  - Wireless Emergency Alerts (WEA) = cellular phone distribution
  - Non-Weather Emergency Messages (NWEM) = weather radio
  - Internet-based services – alert redistributors

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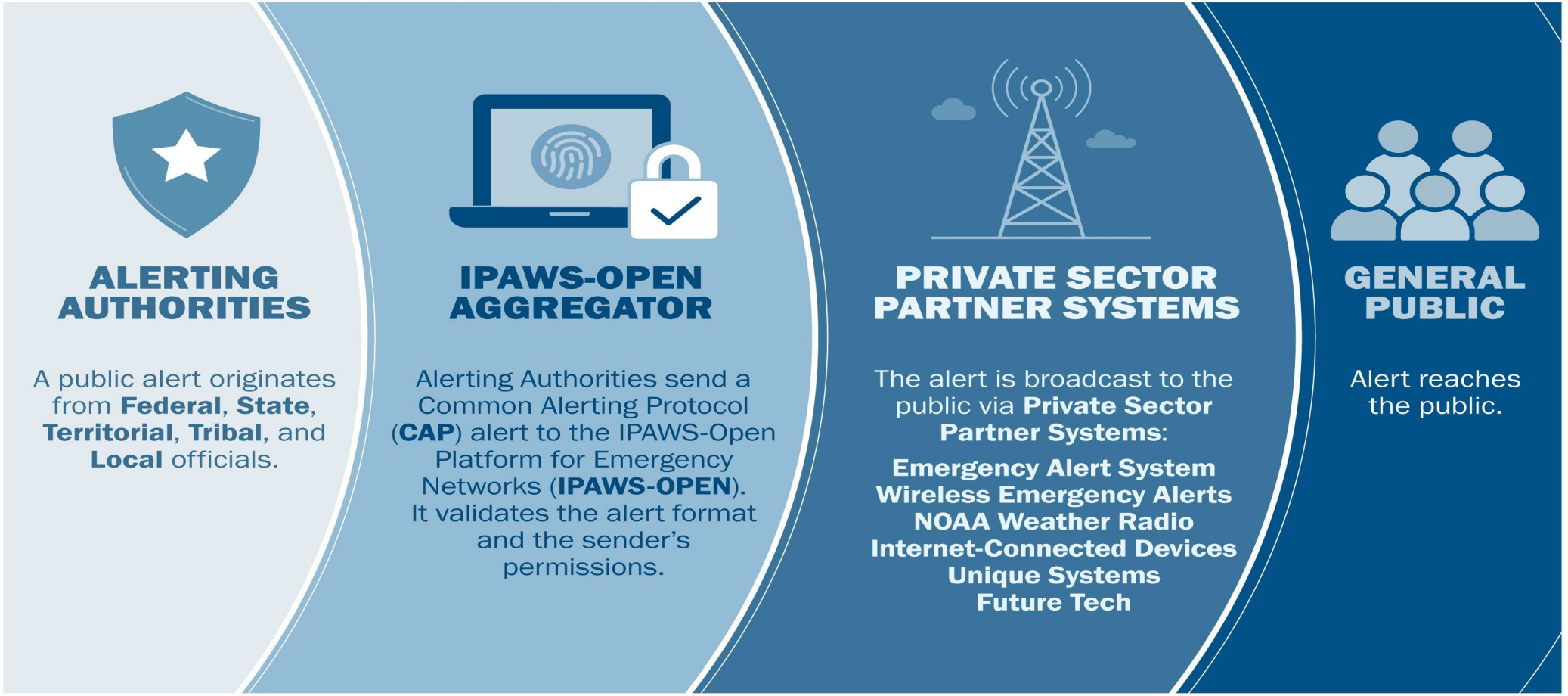
How IPAWS Connects Alerts to People



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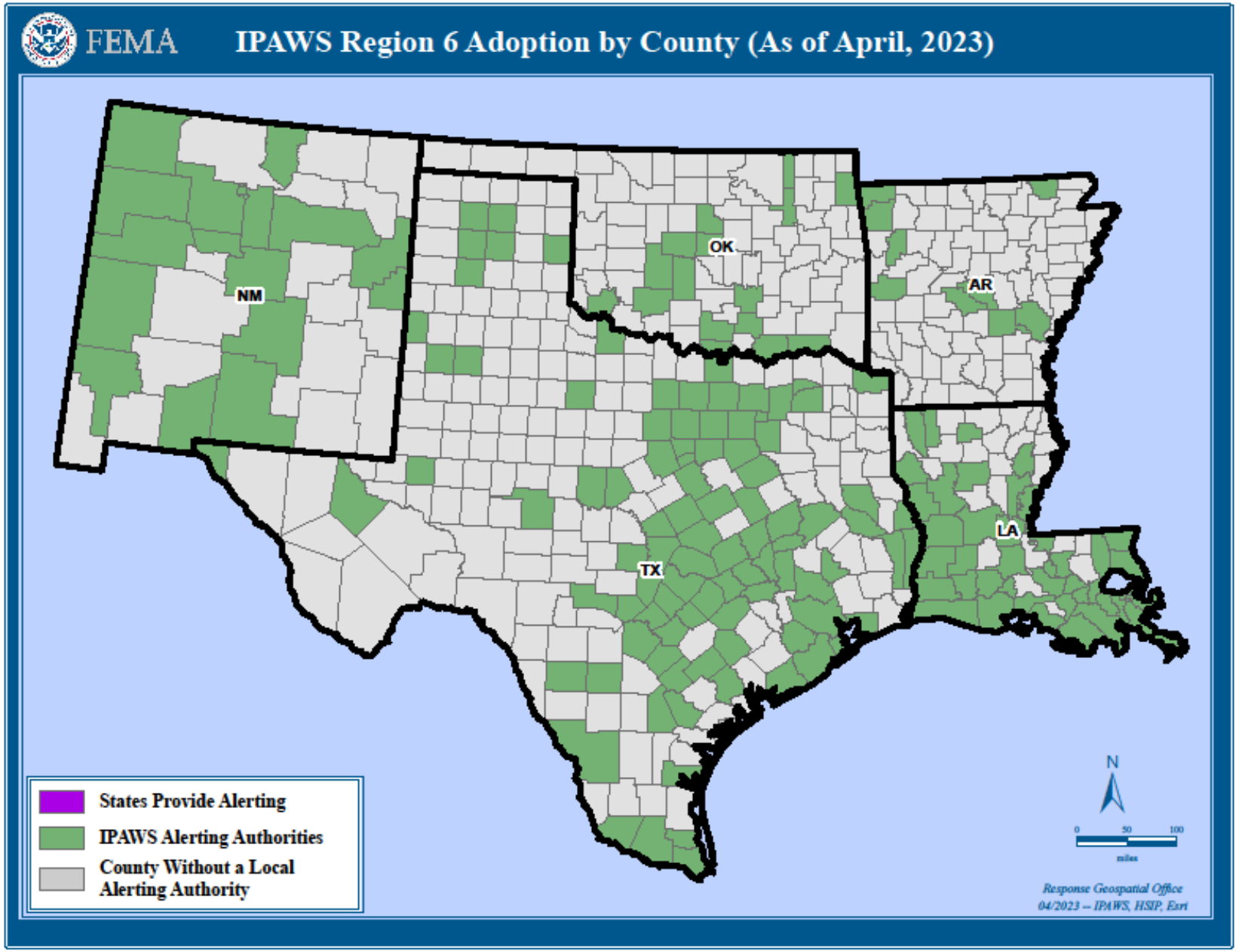
IPAWS Adoption Map

- County Coverage
- Multi-jurisdictional alerting privileges taken into account
- 82.9% of the US population is covered by a local Alerting Authority



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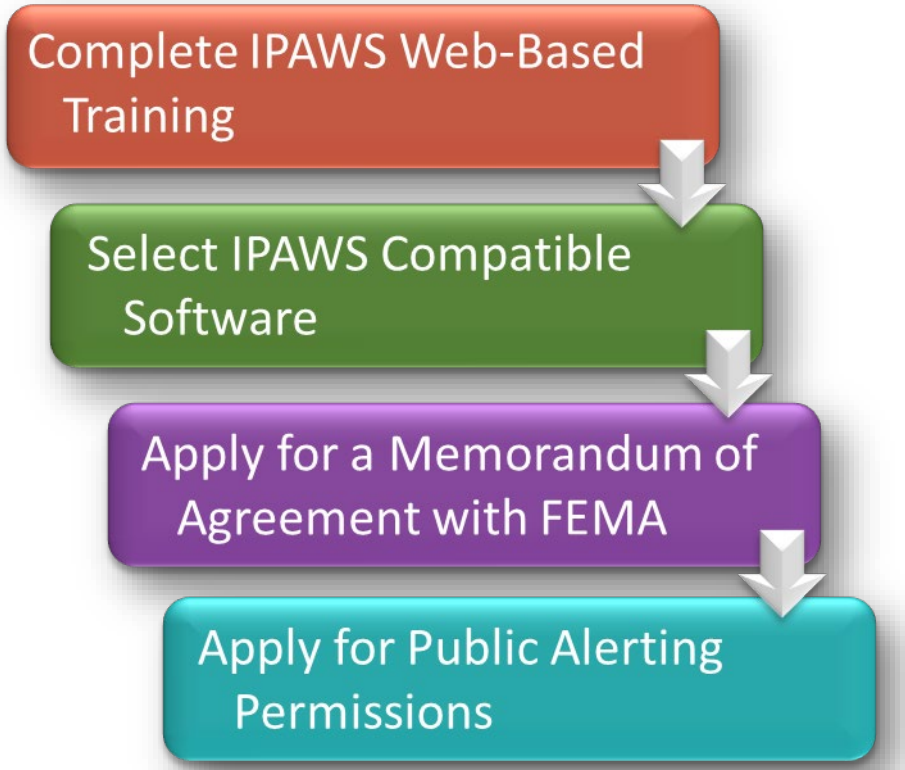
New Alerting Authorities



- *FIRST: Check with your State POC for alerting policy.*
- Check FEMA IPAWS Registration and Login webpage for application, instructions, and information.
  - Complete IPAWS Web-Based training
  - Select an IPAWS-compatible alerting tool
  - Register for an account on the IPAWS User Portal
  - Complete a Memorandum of Agreement
  - Complete the "Public Alerting Application"
    - Coordinate with the state and obtain signature
- After FEMA IPAWS office has the state coordinated "Public Alerting Application" and your completed training certificate, we will issue your digital certificates, public alerting will be enabled in your agencies profile in IPAWS and you can begin to send alerts.

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- Digital Certificates expire after 3 years. Your alerts will be rejected when certificate is expired. *Check your certificate expiration date!*
- Keep your IPAWS User Portal contact information up to date to ensure that the IPAWS can contact you!

Mass Notification System & IPAWS

	Method	Emergency Use Considerations
Mass Notification System	Social Media	- Who's following you? - How often do you post?
	Text Messages/Email	- Subscription-based - Congestion - How many people have registered?
	Reverse Dial Back	- How current is your database? - Congestion
	Local Media	- Procedures/protocols
	Siren System	- Do people know what it means? - Do you have transient population?
IPAWS	Wireless Emergency Alerts (WEA)	- Cellular broadcast to cell phones
	Emergency Alert System (EAS)	- Interrupts Radio, TV, and Cable
	NOAA Non-Weather Emergency Messages (NWEM)	- NOAA Weather Radios
	Internet-based Services	- Redistribution mechanisms

Alert Origination Tool

IPAWS ARCHITECTURE

MOA Process → *Alerting Authorities* → *CAP Software* → *IPAWS-OPEN Gateway* → *IPAWS Pathways* → *Public*

MOA process complete

Digital certificates received

- **Federal authorities**
- **State agencies**
- **Territorial agencies**
- **Tribal governments**
- **Local authorities**

Authorities originate a CAP message via CAP-compliant tool. The message is posted to IPAWS OPEN.

CAP

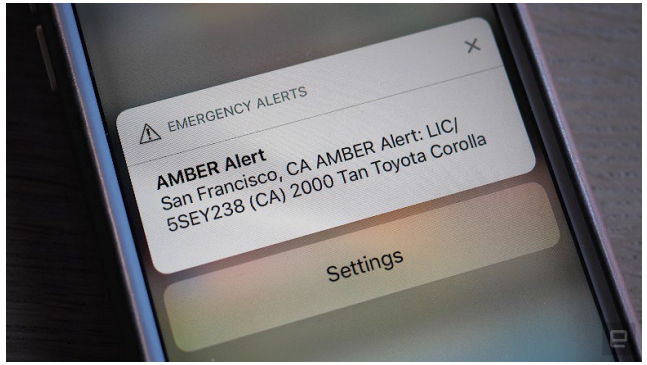
IPAWS OPEN i) validate proper CAP format; ii) verifies Sender and Sender permissions; iii) disseminates to pathways.

- **Emergency Alert System** → EAS
- **Wireless Emergency Alerts** → WIRELESS EMERGENCY ALERTS CAPABLE
- **NOAA Weather Radio**
- **Internet-based Services**
- **Future Technologies** → IoTs

Simultaneous dissemination pathways.

Benefits of Using IPAWS

- Emergency Alert System (EAS)
  - Broadcast
  - **Large footprint**
  - County-based
- Wireless Emergency Alerts (WEA)
  - Broadcast
  - **Medium footprint**
  - Geo-fence via polygon
- NOAA Non-Weather Emergency Messages (NWEM)
  - Broadcast
  - **Large footprint**
  - County-based
- Internet-based services
  - Redistribution via various technologies



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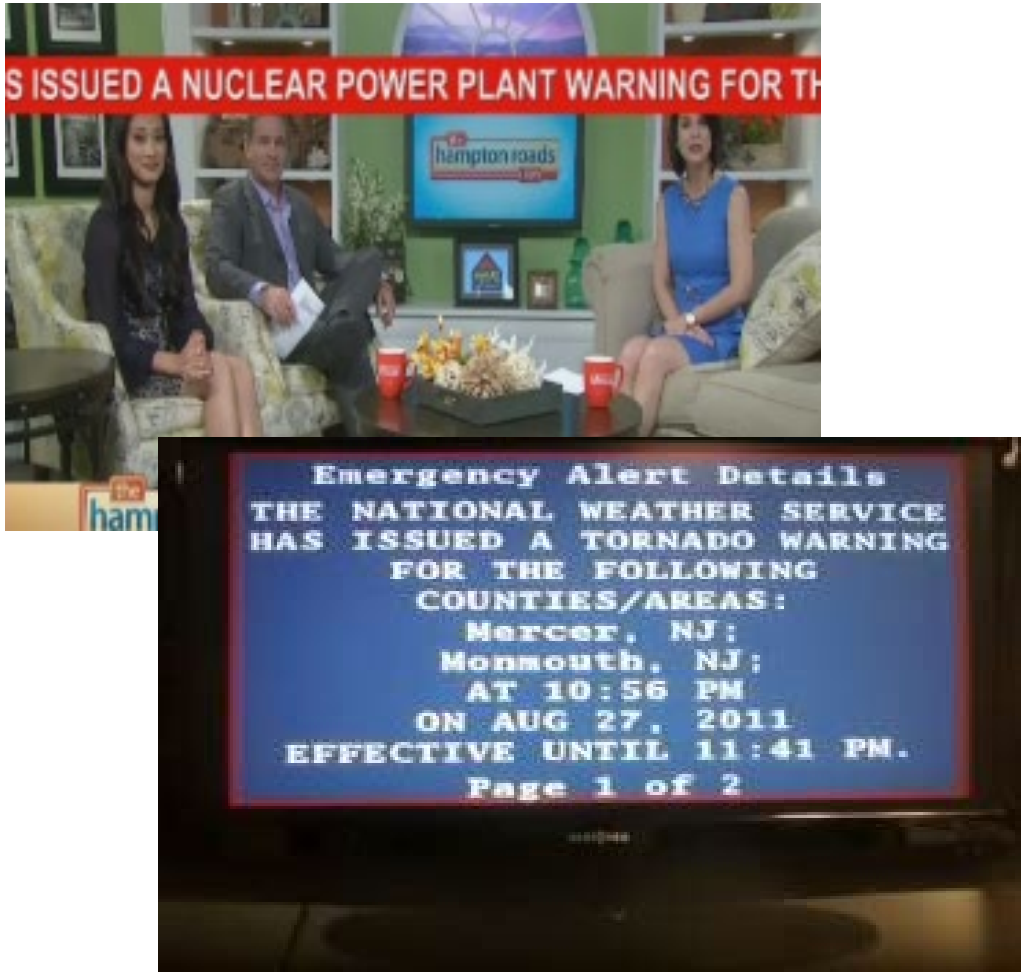
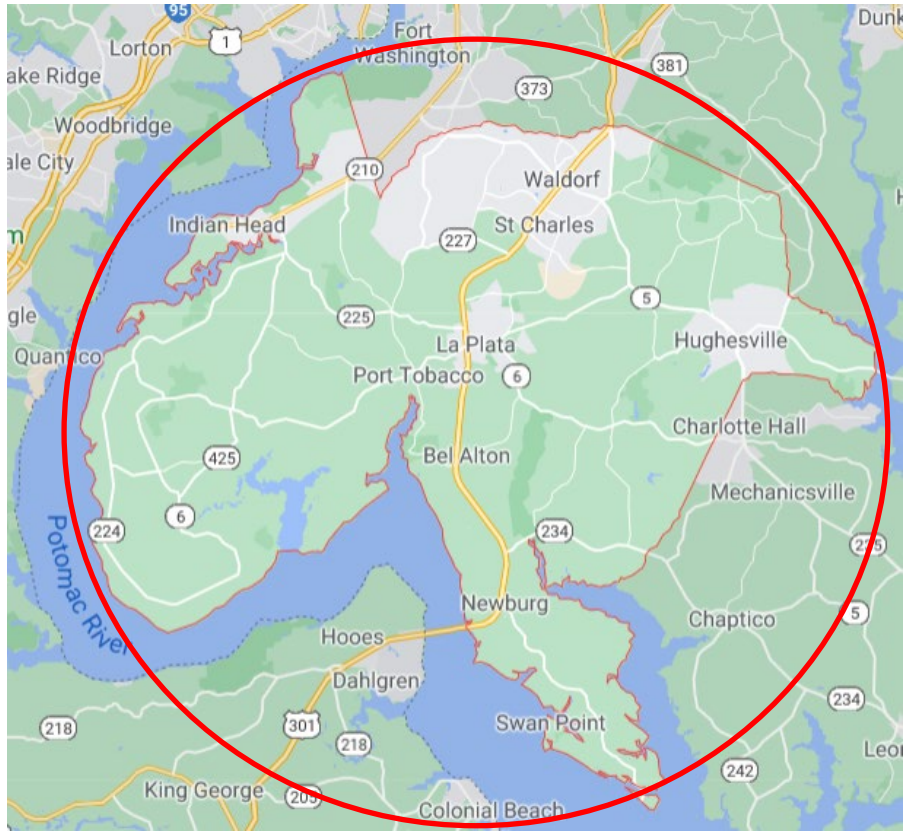
Emergency Alert System

- The benefits of IPAWS for EAS
  - CAP description provided
  - Audio attachments (mp3)
  - Additional languages
- Caveat: Broadcasters **voluntarily carry EAS messages** except national codes
  - What does this mean? Your alert may not air
  - Get to know your broadcasters
  - Agree on what they will carry



EAS Distribution

- EAS distribution is station broadcast coverage wide. EAS does not utilize polygons or circles
- EAS relies upon a county code known as Federal Information Processing Standard (FIPS) code
- What does this mean?
  - Coverage will be based on selected counties
  - Broadcasters select which counties they air alerts for according to their coverage
  - Cable operators may monitor several jurisdictions



Charles County, Maryland coverage

EAS Template

EAS Guidance

- Work with local broadcasters to understand what message type(s) they will carry
- Attach audio if possible (2 min limit); text-to-speech can be garbled
- Avoid symbols such as #, &, *, $, etc.
- Include in message:
  - Describe what is happening
  - Location
  - Action to take
  - Source

Note: the FCC Preamble is an automatic function of broadcast equipment. Highlighted text represents an example of the FCC Preamble. It will precede your EAS message.

IPAWS Template – EAS Description

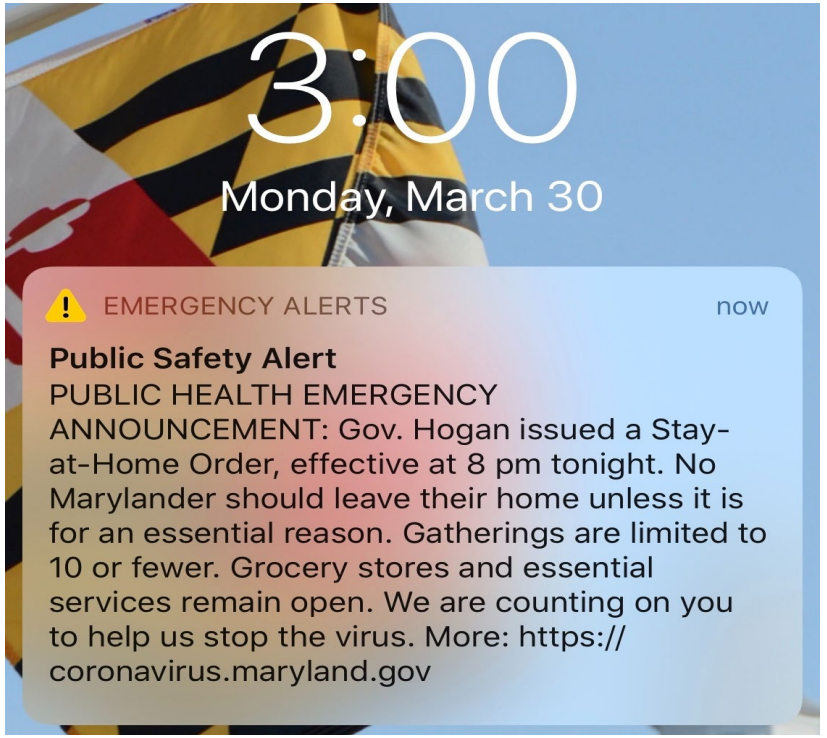
[FCC Preamble]. [description of threat/event] in [location of threat and consequences]. [Protective Action]. [Local, familiar, authoritative message source].

EAS Example

A Civil Authority has issued a Local Area Emergency for Fairfax County, VA until 8:00 pm. Missing elderly male, white, 6 ft tall, silver hair, blue checked shirt, and blue jeans. Disoriented and confused. May be in danger. Last seen near Mount Vernon, Rte 1. If seen please call 9 1 1. FFX Cty Sherriff Office.

Wireless Emergency Alert

- Benefits of IPAWS for WEA
  - Not subscription-based service
    - Your community does not “opt-in” to receive notifications
    - Reach visitors/tourists in your local area
  - Not SMS text message
  - No network congestion
  - All major carriers participate. Well, not so much OCONUS
  - Fast delivery
  - Attention grabbing tone
  - Polygons and circles may assist in distribution constraint

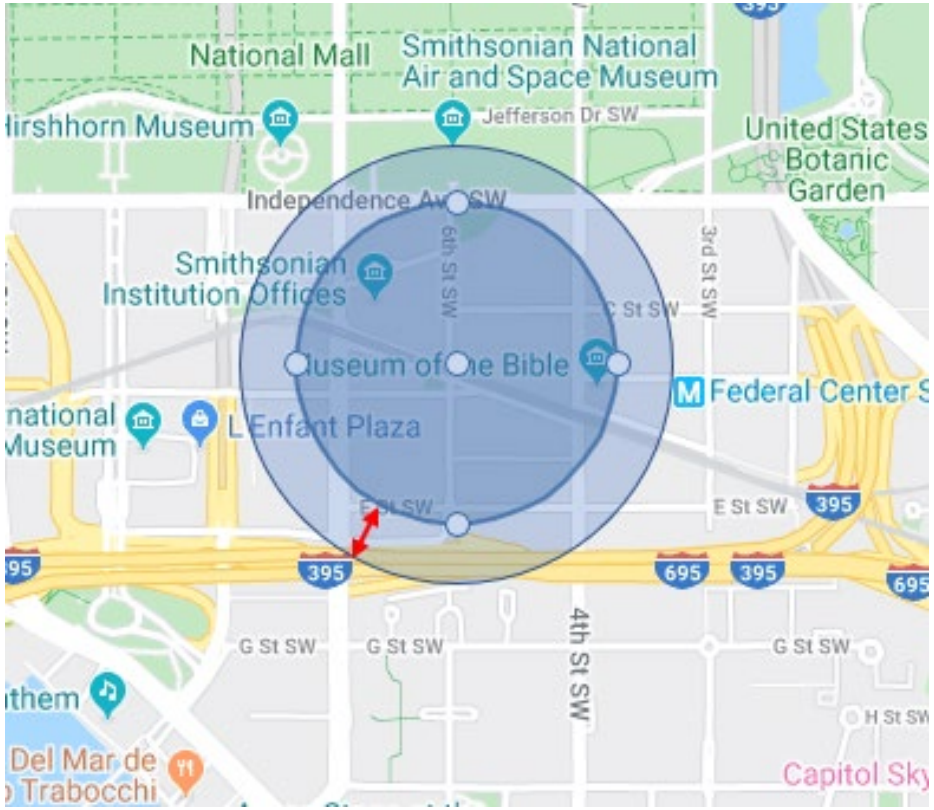


WEA Features

- 360 characters
  - 90 required; 360 optional
- English and Spanish
  - English required; Spanish optional
- WEA Test Code
- Enhanced WEA geo-fencing, a work in progress
  - Alerts available to all connected phones in targeted area
  - No more than 0.1 mile overshoot
  - Only available on newer devices – currently about 83% of cell phones in use can do this

WEA Geo-Fencing

- **Enhanced geo-fencing** – the HOT topic
  - Overshoot no more than 0.10 mile outside of polygon
  - How does it work?
    - It's called = Device-Based Geo-Fencing (DBGF)
    - Cell carriers activate towers that serve the polygon/circle
    - Service (DBGF) running on the cell phone is "smart" enough to know if it should present alert to user
  - Wow! Cool! Does my phone do this?
    - Currently about 83% of phones are capable
    - Cell carriers will continue to approve tower activation
    - Be patient - technology is catching up



Older phones – about 1/6th of phones in service

WEA 1.0 & 2.0 Geotargeting

WEA 1.0 & 2.0 devices do not know where the alert is targeted

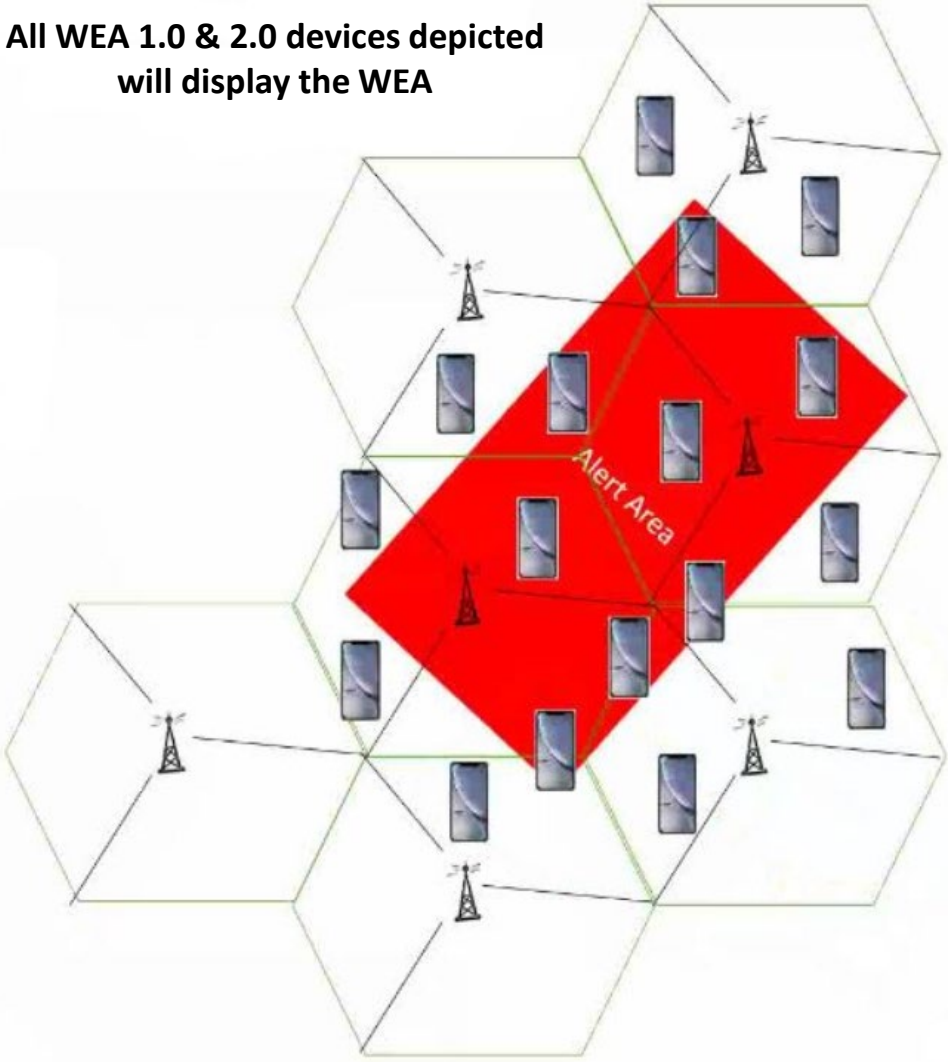
- Geo-coordinates (polygon, circle, geocode) are not delivered to the device.
- Thus, the device will present the WEA upon receipt, independent of location

Cell towers whose RF signal “touch” the alert area will broadcast the WEA.

Consequences:

- Dependent on RF coverage
- RF does not obey “boundaries”
- Overshoot & Undershoot

All WEA 1.0 & 2.0 devices depicted will display the WEA



Boomer Cells – the reach

IPAWS

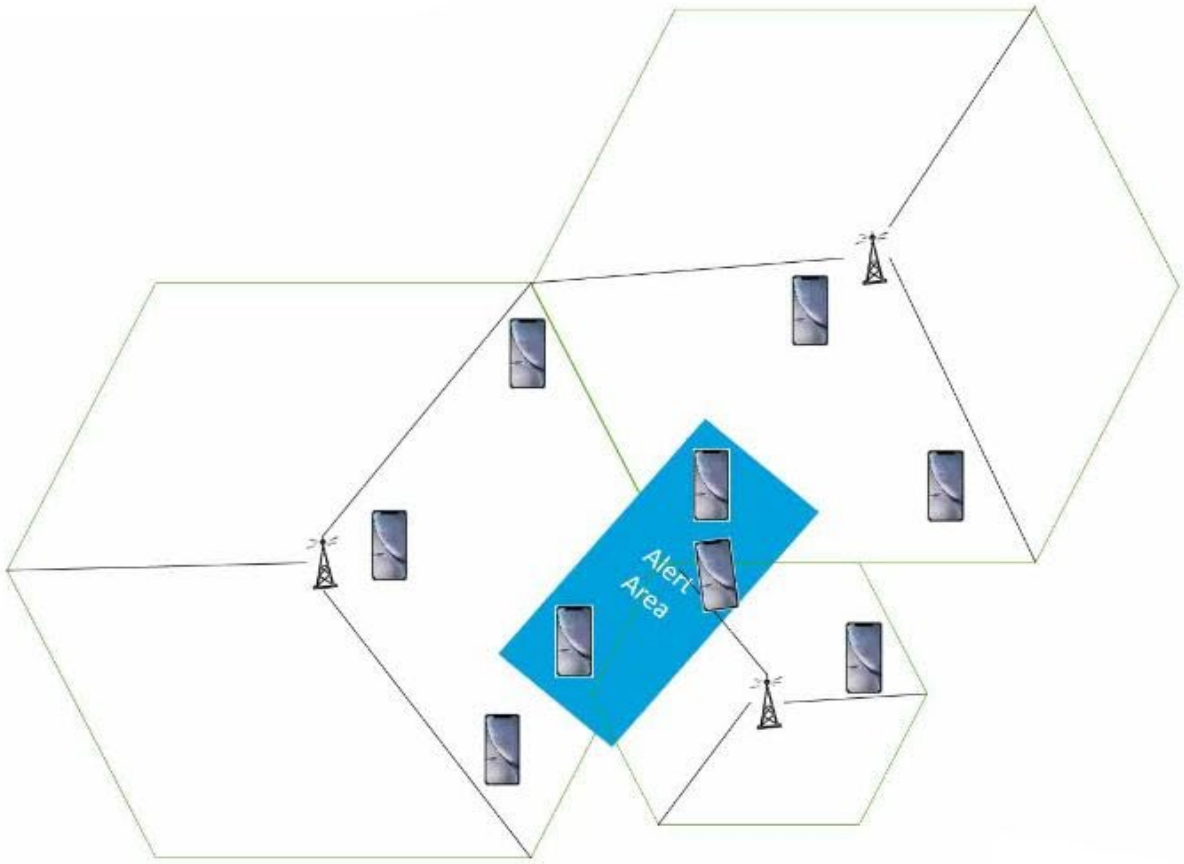
WEA 1.0/2.0 Geotargeting in Rural Areas

Rural challenges:

- Large cell sites – “boomer cells”
- Fewer cells
- Precise geo-targeting difficult with broadcast alone

Result?

- Potential overshoot ~ many miles
- Potential undershoot



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The Future – Device Based Geo-Fencing

WEA 3.0 Geotargeting

As of WEA 3.0, the polygon/circle coordinates are broadcast alone with the WEA Alert

- Geocodes are not delivered to the device

WEA 3.0 devices will determine their location in relation to the polygon/circle

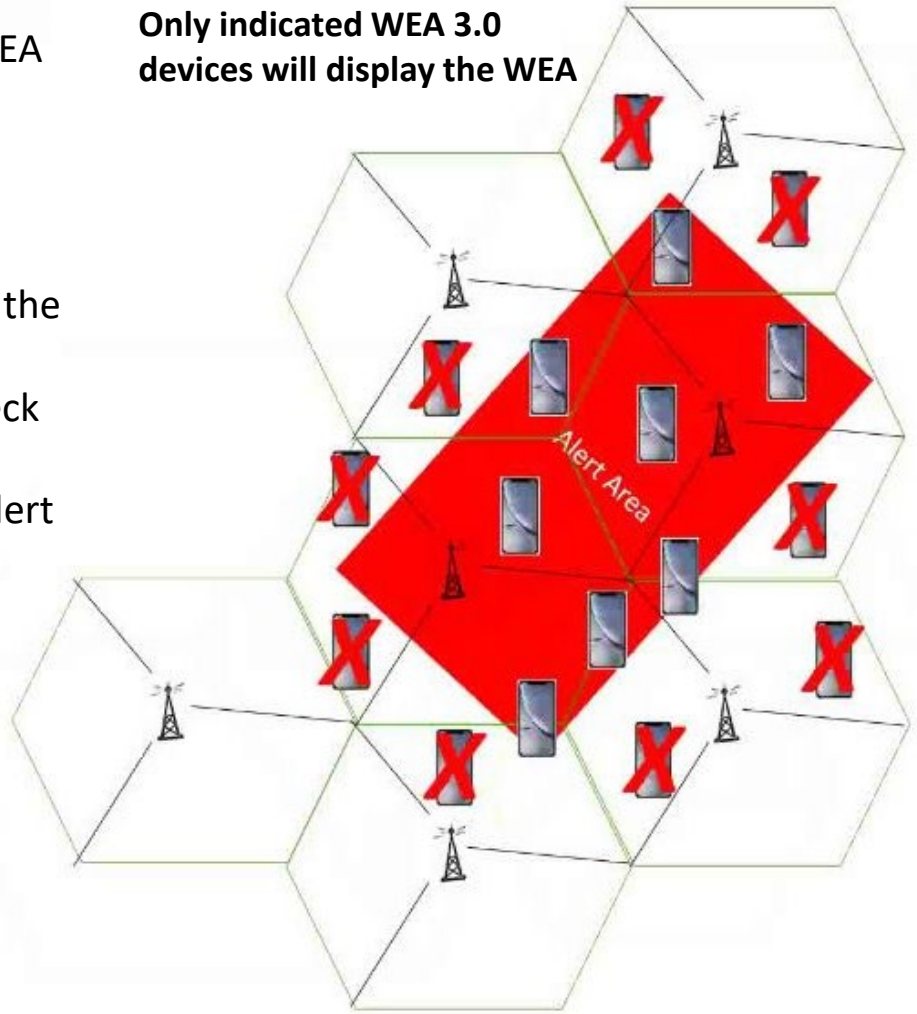
- If inside or within 0.1 mile from the boundary, the device will display the alert
- If >0.1 mile outside, the mobile will not display the alert, and will check periodically to see if it enters the polygon
- If it enters the polygon and the alert is still active, it will display the alert

Device uses it internal location capabilities (GPS, etc.)

- If used has their location disabled, then the device cannot obtain its location for WEA
- If the device cannot determine its location, then by default it will display the alert per WEA 1.0/2.0

Still dependent on RF coverage

Only indicated WEA 3.0 devices will display the WEA



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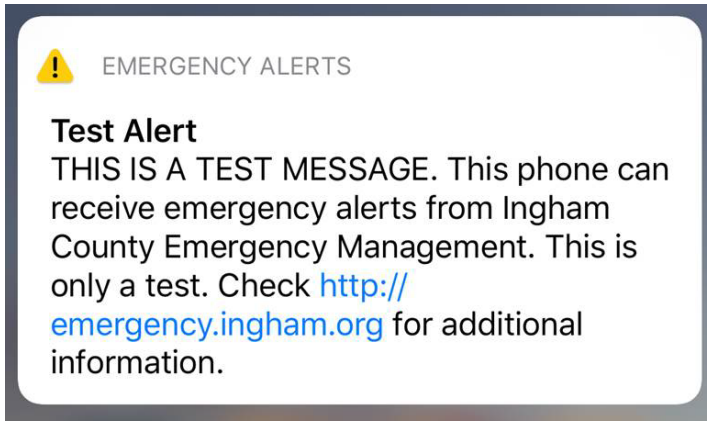
WEA Testing

- **WEA Test Code**
  - Why?
    - You asked for it, you got it!
    - So many requests by Alerting Authorities to test
    - Required an FCC Waiver
  - Results
    - FCC Rulemaking allowed use of event code Required Weekly Test (RWT) for WEA
    - No Waiver requirements
  - How does it work?
    - Alerting authorities verify RWT is enabled for them (via the lab)
    - Plan date of test
    - Monitors must opt-in to receive the RWT
    - Non-invasive to the public
    - Plan for feedback for assessment



Refining WEA Message

Message Content	Influence
Source	Local, familiar, trusted sources are better. Careful of acronyms. May need multiple sources.
Hazard	Describe the threat in plain language. Convey certainty
Location	Use familiar landmarks and known physical boundaries
Protective Action	Explain the actions needed for health and safety
Protective Time	Create urgency, with "NOW", "URGENT" or "IMMEDIATELY"
Consequence Reduction	Supports response efficacy (belief it will make a difference)
Expiration Time	Less important than Protective Action Timing
Other	Literacy matters: Use terms with shared meaning, 6th grade level. Link to trusted information sources to make validation easy. Use maps that increase personalization (people can find themselves)

WEA 360 Character Template

WEA 360 Character Guidance

- Recommended
- Provides more information to public
- Keep in mind non-locals will receive WEA – do not abbreviate or use acronyms that locals only understand
- Include in message:
  - Source
  - Description of event
  - Location
  - Action to take
  - URL or phone number to direct people to more information
    - Tiny URL services save space and can link to social media sites for info, pictures, maps, etc.
    - Plan ahead – linked site must be capable of handling thousands of hits

Template

[local, familiar, authoritative message source]. [description of threat or event] in [location and consequences]. [Protective Action]. [URL, phone number, media for more information]

Example – 291 characters

DC Emergency Management notification. Suspicious package at Washington Monument. Police activity in surrounding area near 15th and 17th streets. Possible hazardous material. Avoid area, stay indoors and away from windows. Go to bit.ly/XXXX or tune to local media for more information.

WEA 90 Character Template

WEA 90 Character Guidance

- Required
- Limited characters are challenging
- Use smart abbreviations
- Keep in mind non-locals will receive WEA – do not abbreviate or use acronyms that locals only understand
- At minimum – include in message:
  - Brief description
  - Location
  - Action
  - URL or phone number for more information (if possible)
  - Source (if possible)

Template

[Hazard] in [Location] [Guidance/Action] go to [URL or phone number] for information [Source]

Example – 89 characters

Police activity at 301 & Rte 5 road closures avoid area Go to Bit.ly/xxxx for info CC-EMA

Message Design Dashboard

- The MDD is coming soon!
- A click-to-select tool to aid in WEA message creation
- Backed by Social Science with proven language

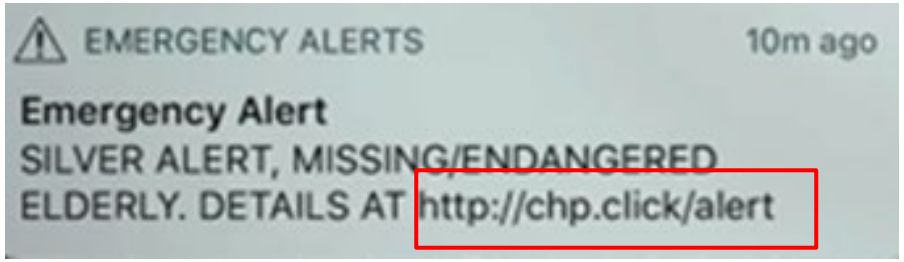
WEA Distribution

- WEA distribution can be constrained
- WEA does recognize polygons or circles
  - polygons and circles should be at least 2-3 city blocks in size
- Cell carriers will activate cell towers in best proximity to polygon or circle
- What does this mean?
  - Coverage footprint is medium <u>expect and plan for significant alert bleed-over</u> (at this time)
  - Important to **clarify** targeted area in WEA message

Charles County, Maryland coverage with circle included in message

Social Media

- California Highway Patrol (CHP)
  - **Tiny URLs**
  - **Twitter**



Twitter benefits:

- Can handle the traffic
- Serves as a means for additional information
- POC available to assist with account setup

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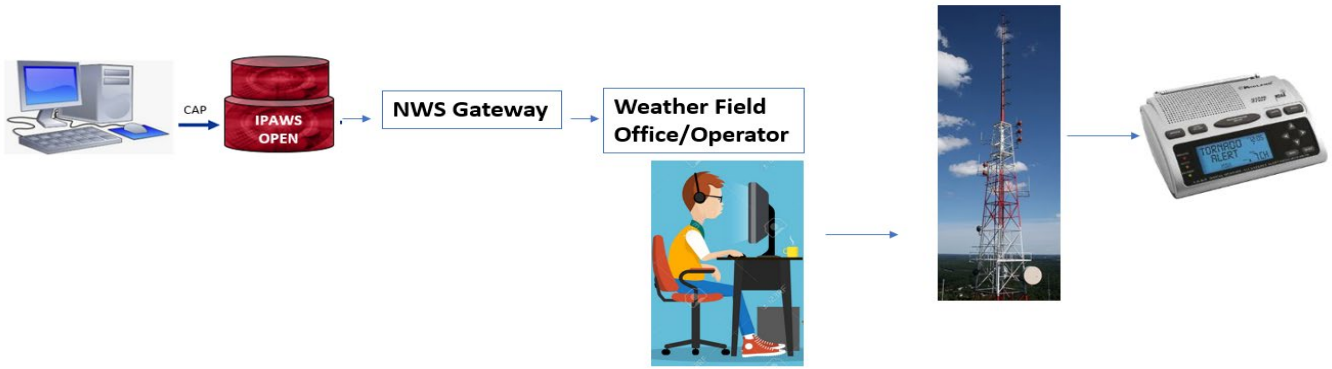
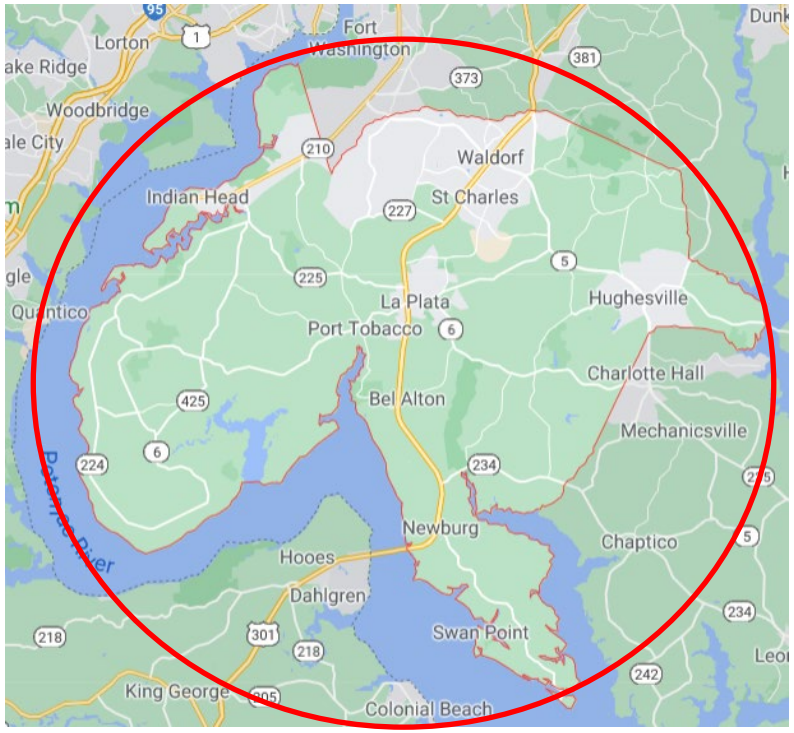
NWEM Distribution

- Non-Weather Emergency Messages (NWEM) are county coverage size via NOAA Weather Radio transmitters
- Reaches NOAA Weather Radios
- Human involvement at the field office





- Note: Field officer reviews message content and may make minimal edits

This capability is now available through all Weather Forecast Offices

Operational Challenges with A&W

- **High Turnover**
- Coordination of **training**
- Lack of education
- Minimal IPAWS experts
- Lack of **exercises**
- Lack of internal plans & processes
- Lengthy approval process
- **SOPs** to include corrective action
- **Technical** challenges
- Spanish translation

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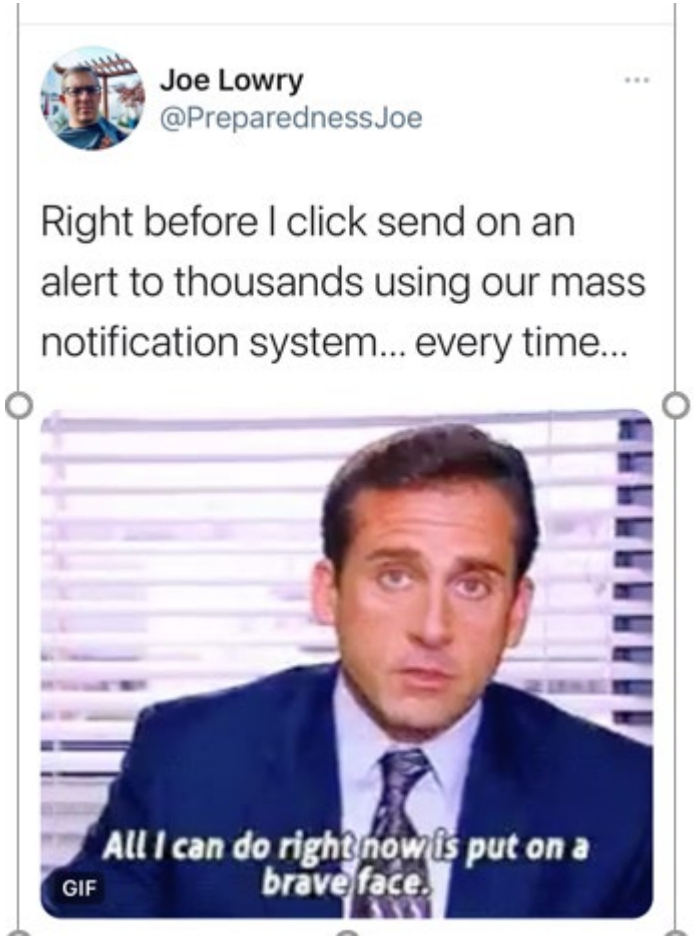
IPAWS



I get that way even if it's just a few hundred. Add the WEA checkbox and I turn into this...

2

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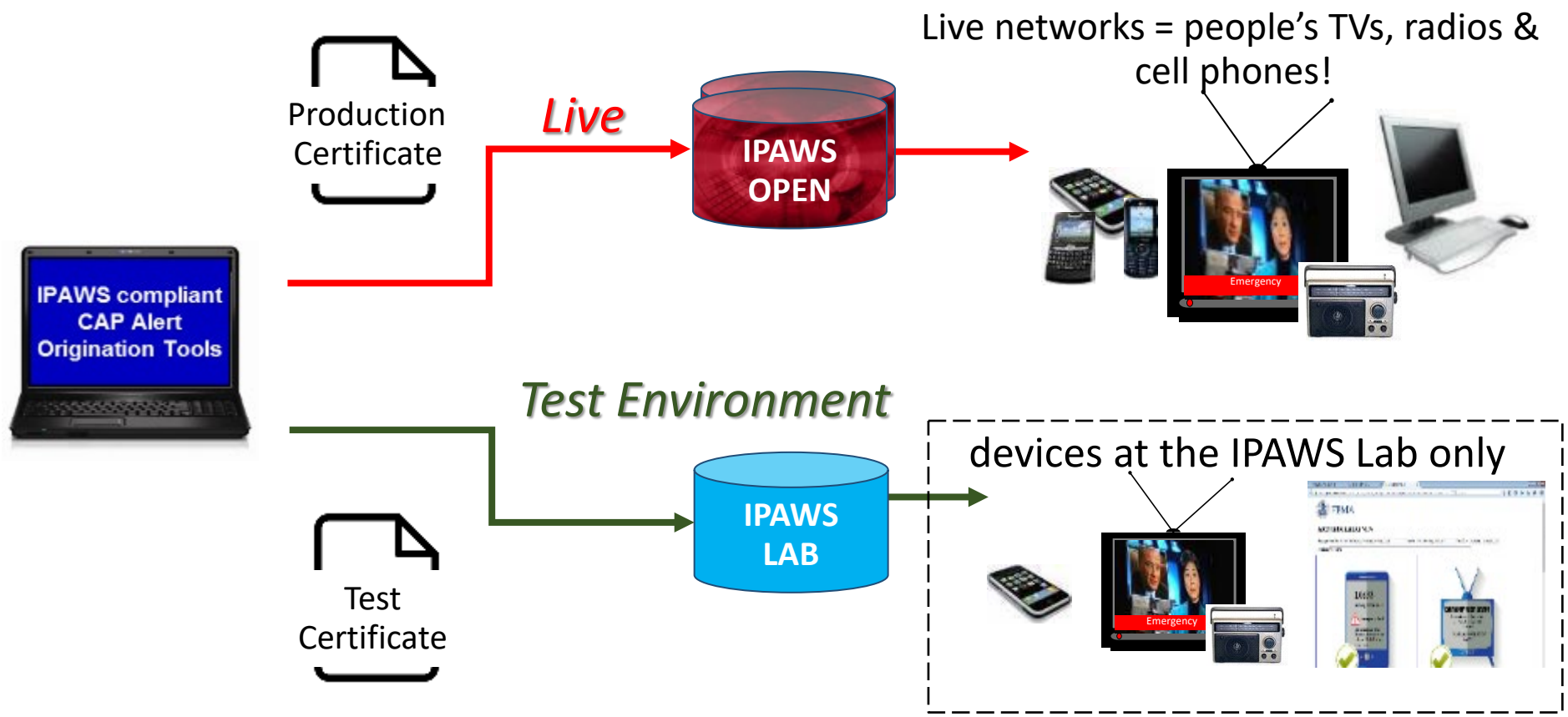
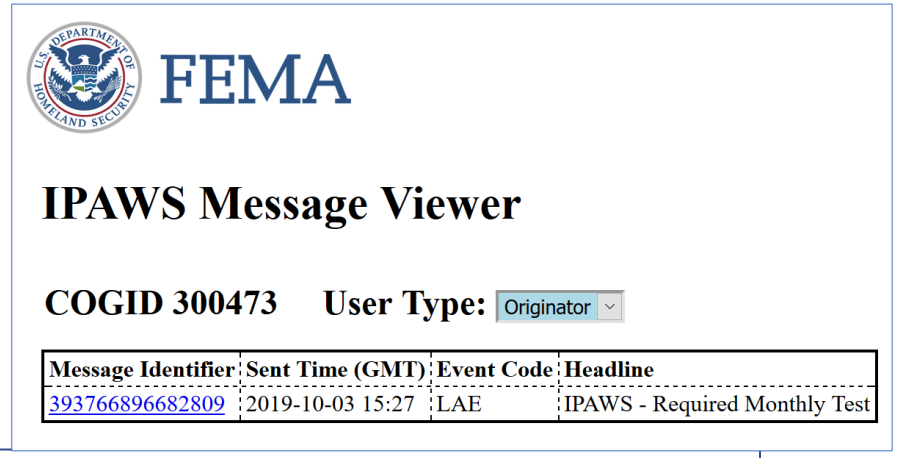
The IPAWS Lab "Demo" Environment

An "offline" sandbox version of IPAWS



IPAWS Message Viewer

- Web interface for Test/Demo environment only (not available in live environment)
- Verify alert
  - Includes WEA 2.0 results
    - 90 and 360 characters
    - English and Spanish
- Available 24/7



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IPAWS Message Viewer

COGID 300473 **User Type:** Originator

Message Identifier	Sent Time (GMT)	Event Code	Headline
393766896682809	2019-10-03 15:27	LAE	IPAWS - Required Monthly Test

CAP WEAHandling Code: Imminent Threat Display WEA 2.0

Language	90 WEA Text	360 WEA Text
English	This is a test of the 90 character wireless emergency alert.	This is a test of the wireless emergency alert system. This message contains 360 characters which will provide more information to the public in time of an emergency. This is only a test.
Spanish	Esta es una prueba de 90 caracteres del Sistema de Alertas Inalambricas de Emergencia	Esta es una prueba del Sistema de Alertas Inalambricas de Emergencia. Este mensaje contiene 360 caracteres para asi proveer al publico mas informacion en casos de emergencia. Esta es una prueba. No tome accion.

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WEA Demo App

- Available for download to iPhone or Android phones
- Enables simulated reception and display of WEA messages sent through the IPAWS Test/Demo environment

IPAWS Technical Support Service Facility

- What does the TSSF do?
  - 24/7/365 technical support
    - Assistance with live and test alerts
    - Troubleshooting errant alerts and status codes
    - Teaching/education
  - Proficiency demonstration support
  - Exercises
  - Conferences, speaking engagements, demonstrations, etc.
  - Refresher training and IPAWS overview
  - Vendor support
  - Q&A

1-84-IPAWSLab

Fema-ipaws-lab@fema.dhs.gov

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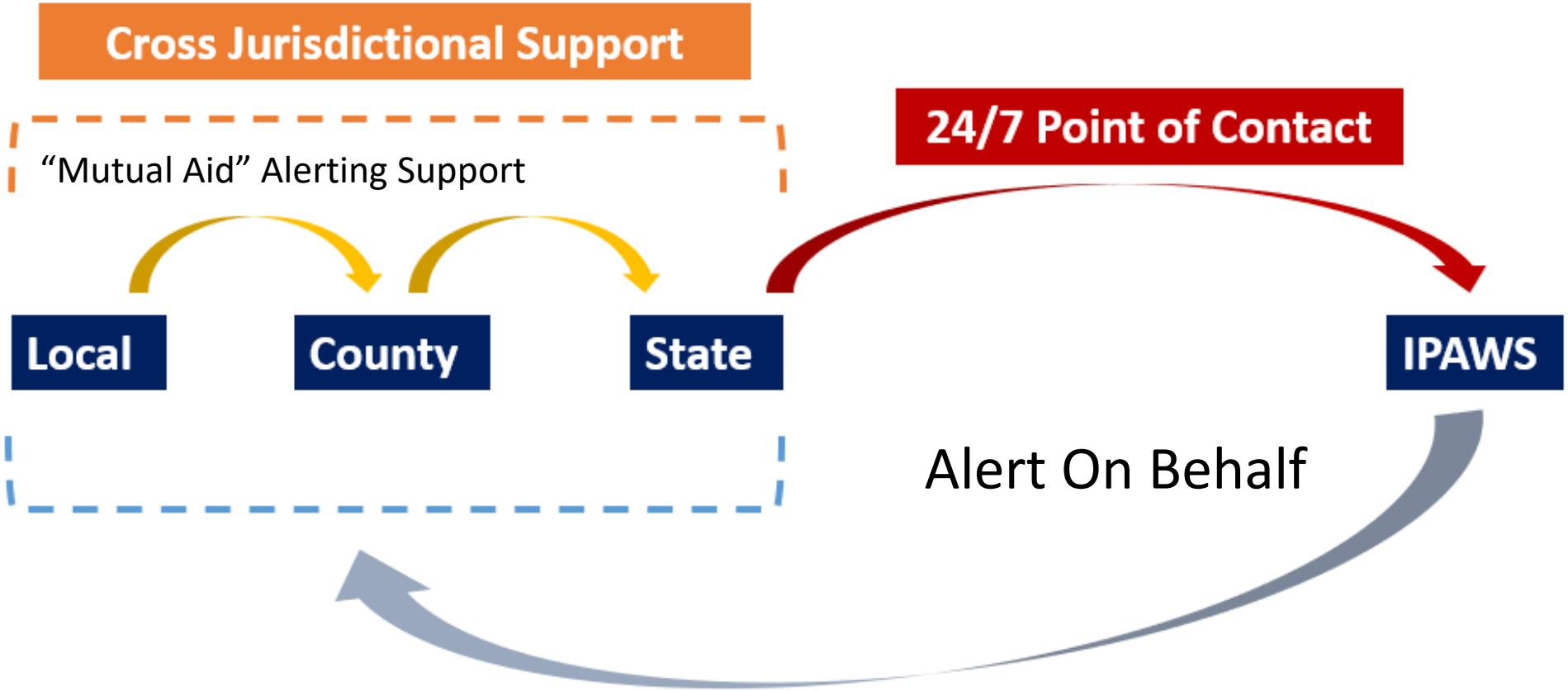
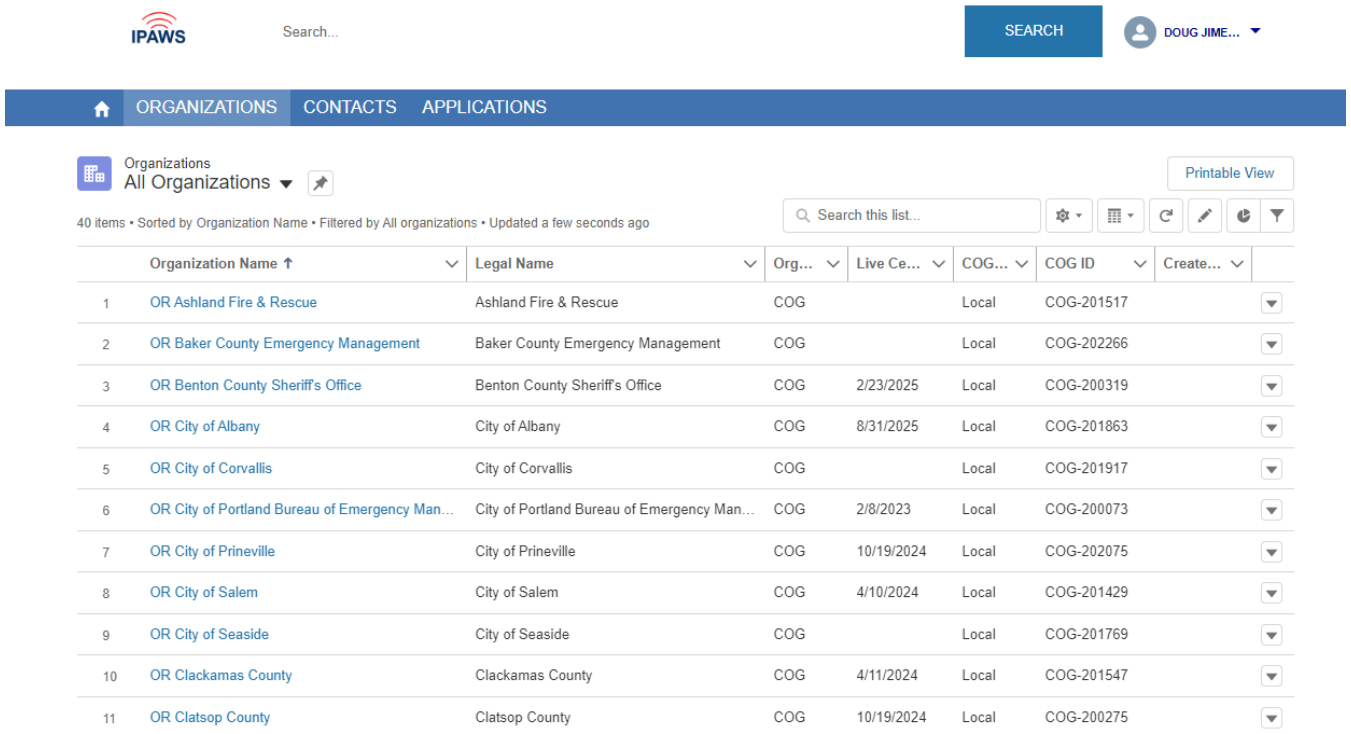
Local/State Alert Escalation Process



IPAWS User Portal

- Teaching the IPAWS User Portal some new tricks
  - Make every local jurisdiction account visible to State IPAWS Reviewing Authorities



	Organization Name	Legal Name	Org...	Live Ce...	COG...	COG ID	Create...
1	OR Ashland Fire & Rescue	Ashland Fire & Rescue	COG		Local	COG-201517	
2	OR Baker County Emergency Management	Baker County Emergency Management	COG		Local	COG-202266	
3	OR Benton County Sheriff's Office	Benton County Sheriff's Office	COG	2/23/2025	Local	COG-200319	
4	OR City of Albany	City of Albany	COG	8/31/2025	Local	COG-201863	
5	OR City of Corvallis	City of Corvallis	COG		Local	COG-201917	
6	OR City of Portland Bureau of Emergency Man...	City of Portland Bureau of Emergency Man...	COG	2/8/2023	Local	COG-200073	
7	OR City of Prineville	City of Prineville	COG	10/19/2024	Local	COG-202075	
8	OR City of Salem	City of Salem	COG	4/10/2024	Local	COG-201429	
9	OR City of Seaside	City of Seaside	COG		Local	COG-201769	
10	OR Clackamas County	Clackamas County	COG	4/11/2024	Local	COG-201547	
11	OR Clatsop County	Clatsop County	COG	10/19/2024	Local	COG-200275	

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IPAWS User Portal + AOB

- Secure Identity confirmation for Alert On Behalf requests
  - We will issue Unique Numerical Identifiers to designated 24/7 contacts for use in Alert On Behalf scenarios

Organizations > MI Michigan State Police Emergency Management

Contacts

4 items • Sorted by Last Name • Updated a few seconds ago

	Contact Name	Status	Role	Title	Email
1	Jaclyn Barcroft	Approved	Primary	Emergency Communications Spe...	barcroftj@michigar
2	Brianna Briggs	Approved	Alternate	Operations Management Section...	briggsb3@michiga
3	Larry St. George	Approved	Alternate	Emergency Operations Unit Man...	stgeorgel@michiga
4	Kevin Sweeney	Pending	Signatory	Commander, Emergency Manag...	sweeneyk@michiga

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What can you do???

- Use the lab
- Ask questions
- **Practice** and more practice
- **Train** regularly
- Incorporate IPAWS into **exercises**

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IPAWS

Integrated Public Alert & Warning System

QUESTIONS?

Alfred.Kenyon@fema.dhs.gov

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- IPAWS Registration and Login | FEMA.gov

The IPAWS Program Planning Toolkit

The IPAWS Process Playbook

The IPAWS Exercise Starter Kit

NIC Technical Assistance Seminars

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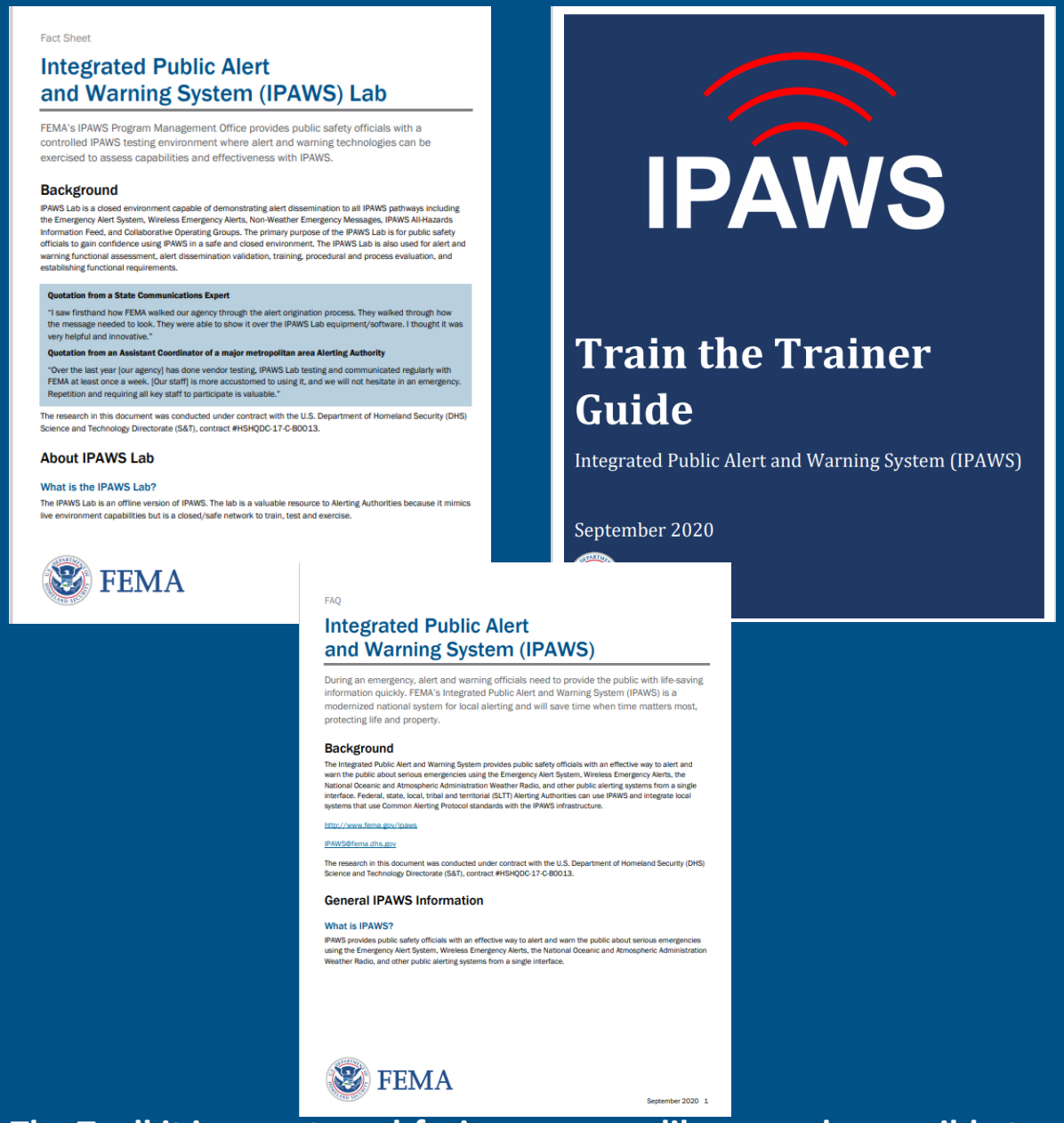


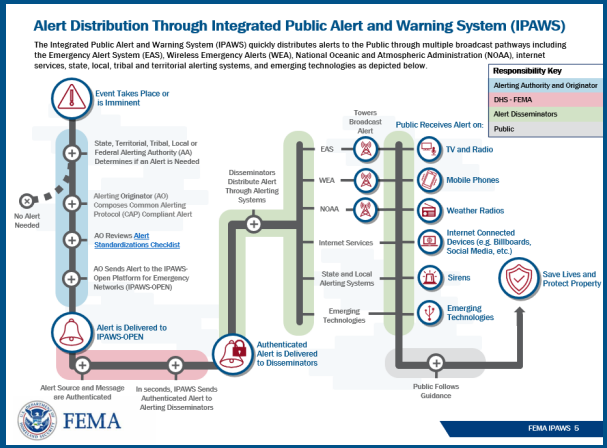
The Toolkit is an external-facing resource library and accessible to all Stakeholders. It can be found at https://www.fema.gov/media-collection/ipaws-program-planning-toolkit

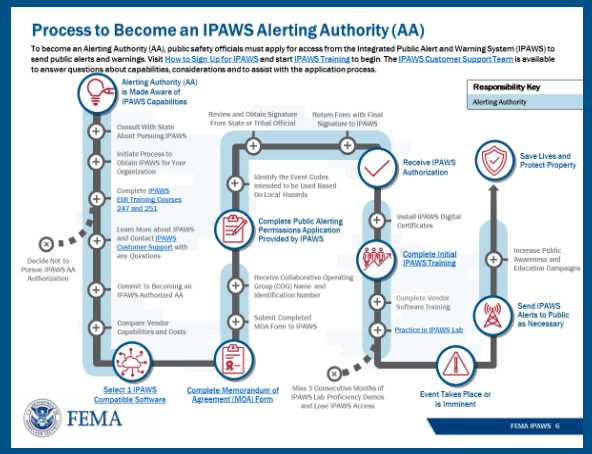
The IPAWS Program Planning Toolkit

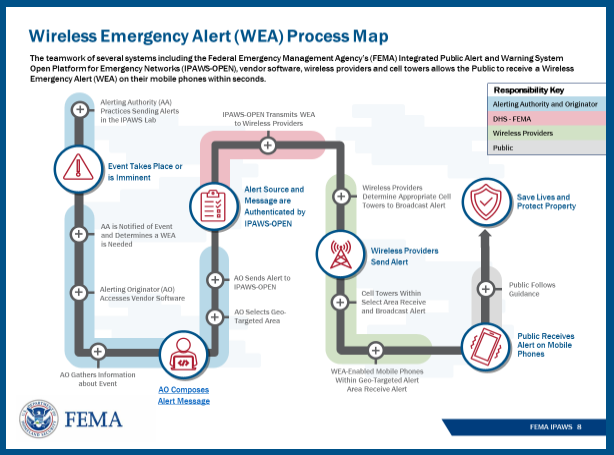
FEMA IPAWS and the Department of Homeland Security Science and Technology worked to identify gaps in existing IPAWS alerting messaging. A result of that partnership is the IPAWS Toolkit. It consists of three documents:

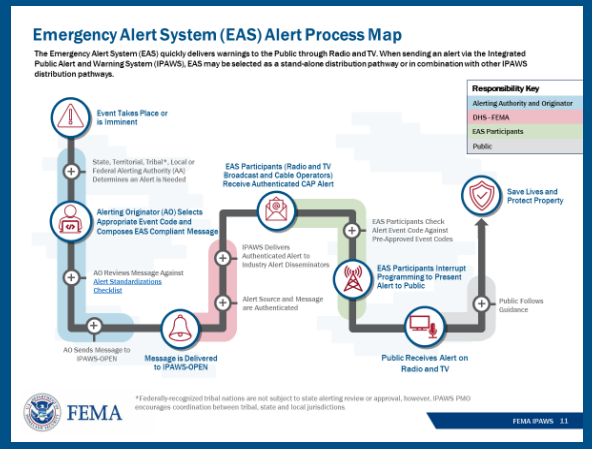
- IPAWS Lab Fact Sheet
- IPAWS Train the Trainer Guide
- IPAWS Frequently Asked Questions

The toolkit will assist public safety agencies to minimize alerting delays; plan for future alerts, warnings and notifications enhancements; facilitate interoperability across different technologies; and improve information sharing among emergency management and public safety officials.









The process maps direct the reader to additional resources, clarify areas of responsibility, recommend appropriate procedures, and explain more granular processes.

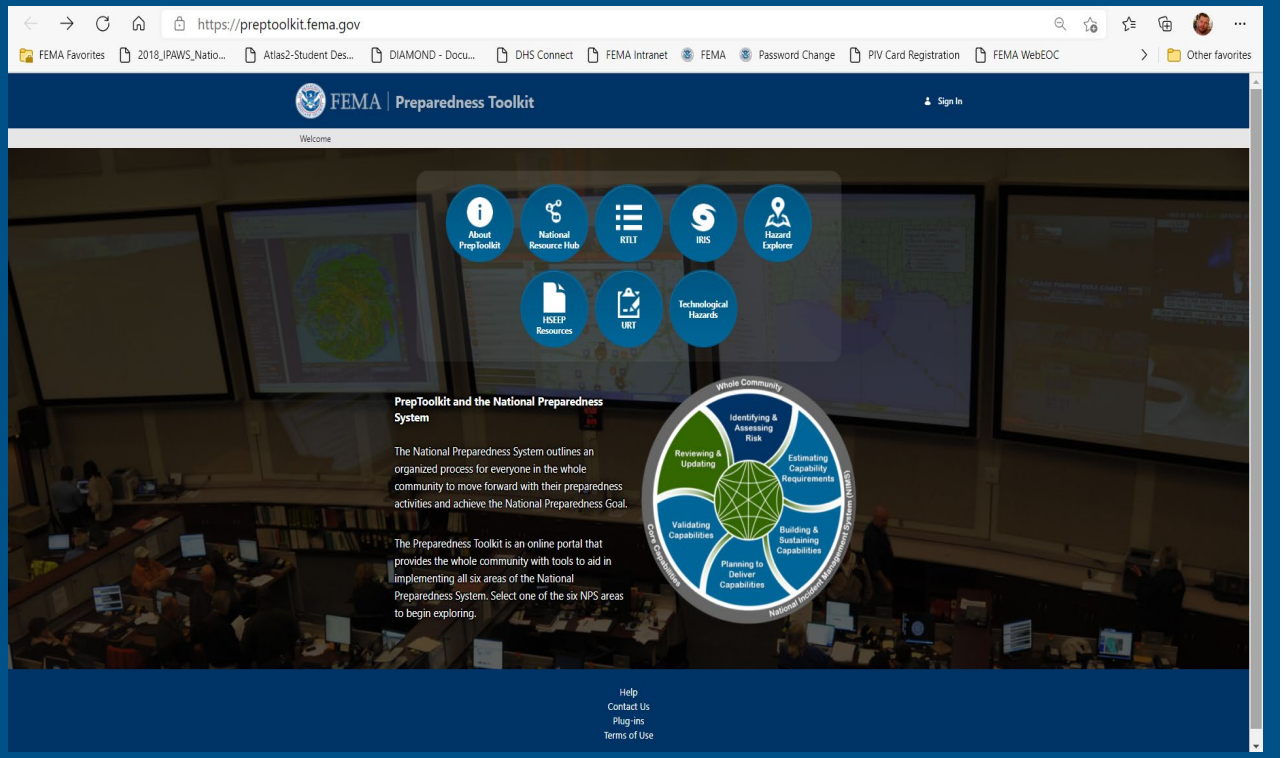
The IPAWS Process Playbook

The IPAWS Process Playbook is a new tool developed to enhance IPAWS program knowledge for stakeholders by visually illustrating interconnected processes between Alerting Authorities, Government, and the private sector.

The Playbook is an external-facing document and accessible to all Stakeholders. It can be found through:

- FEMA.gov
- 2020 IPAWS Program Planning Toolkit
- FEMA Emergency Management Institute Courses:
  - IS-247.B IPAWS for Alert Originators
  - IS-251.A IPAWS for Alerting Administrators

The IPAWS ESK is found on the FEMA Preparedness Toolkit.
Preptoolkit.fema.gov



An ESK is a set of sample documents an organization can customize to conduct their own/integration into existing exercise. Each ESK provides stakeholders across the whole community with ready-to-use materials and templates to develop, conduct, and evaluate an exercise tailored to their specific threats, resources, operational plans, and procedures of their organization or jurisdiction.

The IPAWS Exercise Starter Kit

Why use the IPAWS ESK?

- Includes sample Facilitator/Evaluator Guide, sample Conduct Slides, sample Situation Manual (SitMan), sample Placemat and sample Exercise Evaluation Guides (EEGs).
- Includes discussion questions as part of the Facilitator/Evaluator Guide and are tailorable to organization's unique needs and missions.

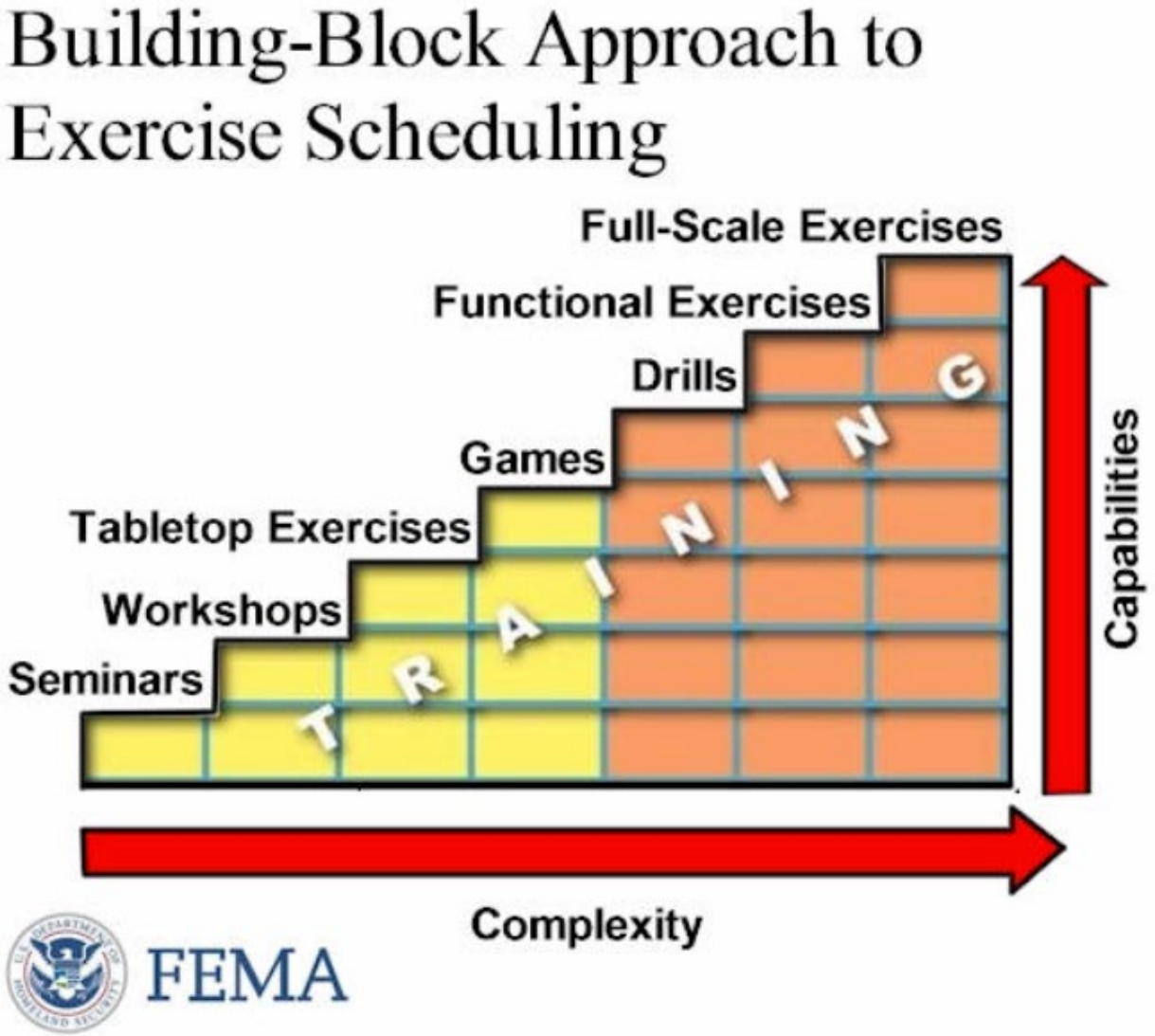
Who Can Use the IPAWS ESK?

- Anyone. Federal, State, Tribal, Territorial, and Local Emergency Management Exercise Officers and Alerting Authorities are encouraged to collaborate and coordinate the integration of IPAWS capabilities into existing exercises.
- Exercise Planners and Alerting Authorities will benefit from increased involvement of IPAWS capabilities into training and exercise initiatives by inclusion of all individuals authorized to operate alert origination tools and send alerts to the public.

Exercise Support

- National Exercise Division (NED)
- National Integration Center (NIC) A&W Technical Assistance
- Tech Hazards Division (THD)
- DHS Science and Technology (S&T)
- National Level Exercise (NLE) support
- FEMA Emergency Management Institute (EMI)
- NOAA NWEM testing
- FSLTT tailored exercises

Can I incorporate IPAWS into exercises?



Yes, you can!
You can incorporate IPAWS into all levels of exercises

- Familiarize yourself and personnel with IPAWS
- Assess content of current plans and procedures regarding alert and warning
- Identify areas for improvement
- Expand knowledge of IPAWS
- Expose areas where IPAWS can be incorporated
- Improve proficiency
- Make mistakes during exercise

Keep in mind…

- Public Information & Warning spans <u>all 5 mission areas</u>

Example Exercise Objectives:

- Successfully deliver a shelter-in-place message for a specific area for police activity - avoid this area, etc. within X minutes of notification of the need for this alert. (<u>Response Mission Area</u>)
- Successfully deliver a message identifying the location of the Family Reunification Center, Red Cross Shelter, etc. to a specific area within X minutes of notification of the need for this order. (<u>Recovery Mission Area</u>)

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Seminars and Workshops

- Virtual or in-person
- Interactive discussions and shared experiences
- Collaborative environment
- Updates on IPAWS and other alert and warning methods
- Demonstrations and Q&A
- Some efforts supported by IPAWS PMO:
  - FEMA National Integration Center Technical Assistance (NIC TA)
  - Urban Areas Security Initiative (UASI) Program
  - FEMA Chemical Stockpile Emergency Preparedness Program (CSEPP)
  - FEMA sponsored events
  - SLTT planned events
  - Vendor-supported workshops

Alert and Warning (A&W) messaging and dissemination is a rapidly evolving field requiring emergency management organizations to update their A&W capabilities, processes and messages. The NIC TA seminars are meant for those with a role in communicating protective action guidance to the public immediately preceding and during an event. The TA is designed to support participants from a mix of jurisdictions as well as multiple participants from the same jurisdiction.

NIC TA Objectives from 1-day (8 hour) in-person delivery or two half-day virtual delivery sessions:

- Improve jurisdictions' ability to communicate effectively to public before, during, and after disasters by
  - Identifying potential delays in issuing A&W messages
  - Developing strategies to maximize message reach
  - Using research-based practices to develop A&W messages that minimize public delay in taking action
  - Enhancing management of social media during a disaster
- Enhance cross-jurisdiction collaboration

Table-Top Exercises (TTX)

- Virtual or in-person
- Seminar instruction
- Discussion based
- Collaborative approach
- Assess policies and procedures
- No impact on the public

FEMA Emergency Management Institute (EMI) + IPAWS

- Coordinated delivery IPAWS PMO and EMI
- 25 SLTT participants
- 2 modules of seminar instruction regarding IPAWS
- Followed by demonstration of IPAWS lab use
  - *Key takeaways*:
    - Increased training
    - Need to incorporate IPAWS into more exercises

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Full-Scale Exercises

- Drills, Functional & Operational
  - HSEEP guidelines
  - Development of injects for Master Scenario Event List (MSEL)
  - Exercise plan
- Pre-tests
  - IPAWS lab
- Assistance during Exercise
  - On-site technical assistance
  - HSEEP Evaluators
  - After Action Reports
  - Participation in hot-washes
  - Follow-up

DHS S&T OpEx: Next Generation First Responder

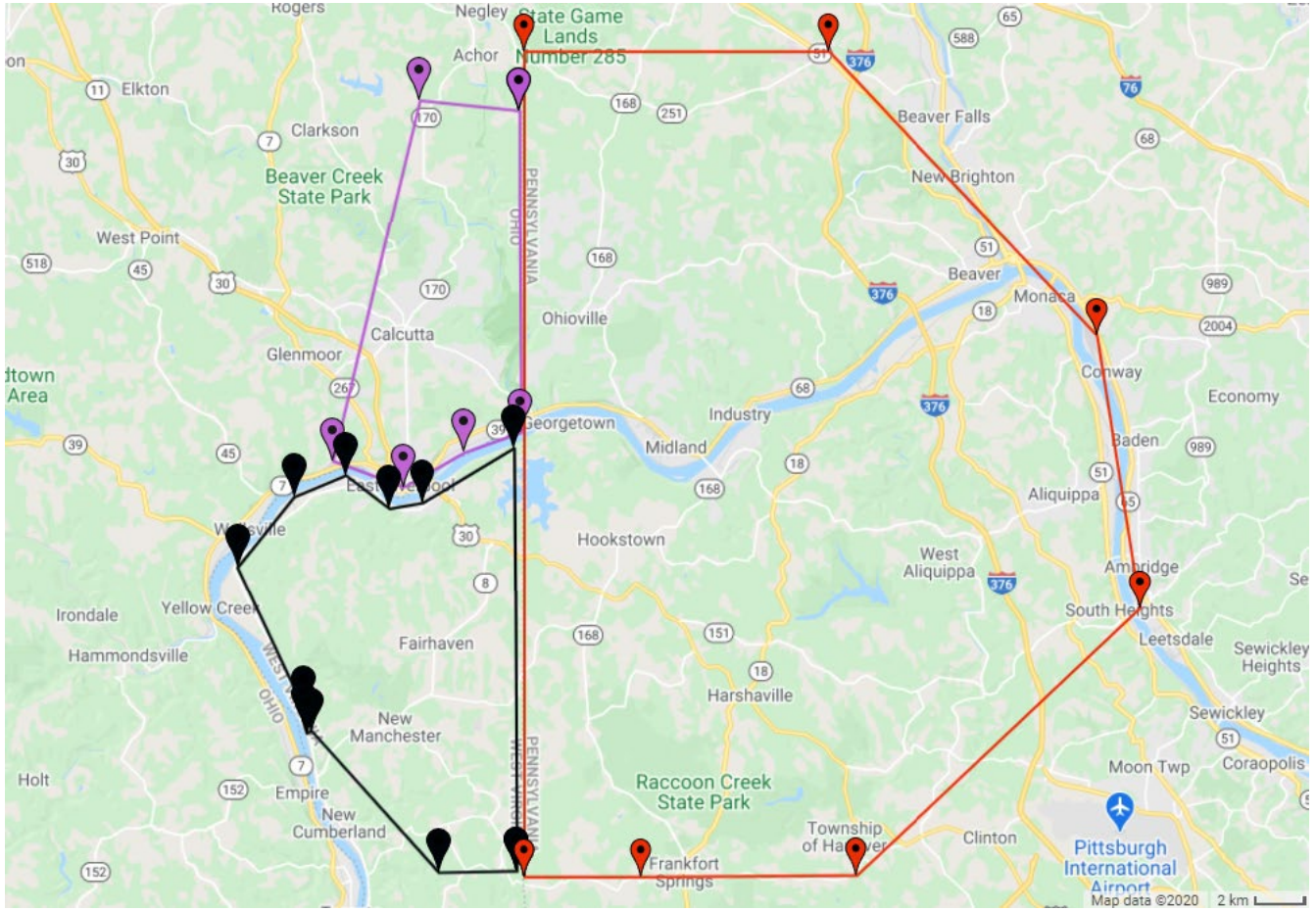
- Harris County TX incorporated IPAWS into exercise
- IPAWS Lab assisted with development of injects
- Evaluated exercise and provided After Action Report

VITEMA Operation Blue Roof

- Virgin Islands Territorial Emergency Management Agency (VITEMA)
- FEMA National Exercise Division (NED) + IPAWS
  - HSEEP guidelines
  - Evaluated
  - After Action Report
- Emphasis on public alert and warning
  - Mass notification
  - IPAWS
  - Broadcasters
  - Public safety official comms

Evaluated & Specific Requests

- WEA activation to announce power plant siren test
  - Beaver County, PA
  - Hancock County, WV
  - Columbinia County, OH
- 3 WEAs activated – 1 per county
  - 15 minute intervals
  - Message notified residents of test



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TSSF Assistance - Unique Uses

- LAX WEA test
  - Assess effectiveness of WEA for large transient population
  - Thorough test planning and outreach efforts
  - Pre-testing with the lab
  - Live assistance with the IPAWS Lab