



# The Integrated Public Alert and Warning System (IPAWS)

Get Alerts, Stay Alive

**IPAWS 101**



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2017

# The Evolution of Emergency Alerting



**1951 - 1963**  
**CONELRAD**

**1963 - 1997**  
**EBS**

**1997 - 2006**  
**EAS**

**2006**  
**IPAWS**

Originally called the “Key Station System,” the **CON**trol of **E**lectromagnetic **R**adiation (CONELRAD) was established in August 1951.

Participating stations tuned to 640 & 1240 kHz AM.

Initiated a special sequence and procedure designed to warn citizens.

Established to address the nation through audible alerts.

Did not allow for targeted messaging.

Upgraded in 1976 to provide more accurate alert receptions.

Designed to provide the President with an expeditious method of communicating.

Later expanded for use during peacetime at state and local levels.

Coordinated by the FCC, FEMA and NWS.

Designed for President to address the nation within 10 minutes.

Messages composed of 4 parts:

- Digitally encoded header
- Attention Signal
- Audio Announcement
- Digitally encoded end-of-message marker

Provided better integration.

Modernizes and integrates the nation’s alert and warning infrastructure.

Integrates new and existing public alert and warning systems and technologies through adoption of new alert information exchange format - the Common Alerting Protocol, or CAP.

Provides authorities with a broader range of message options and multiple communications pathways.



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***IPAWS enhances and extends a national infrastructure and capability to local, state, territorial, and tribal officials for public alerting and warning***

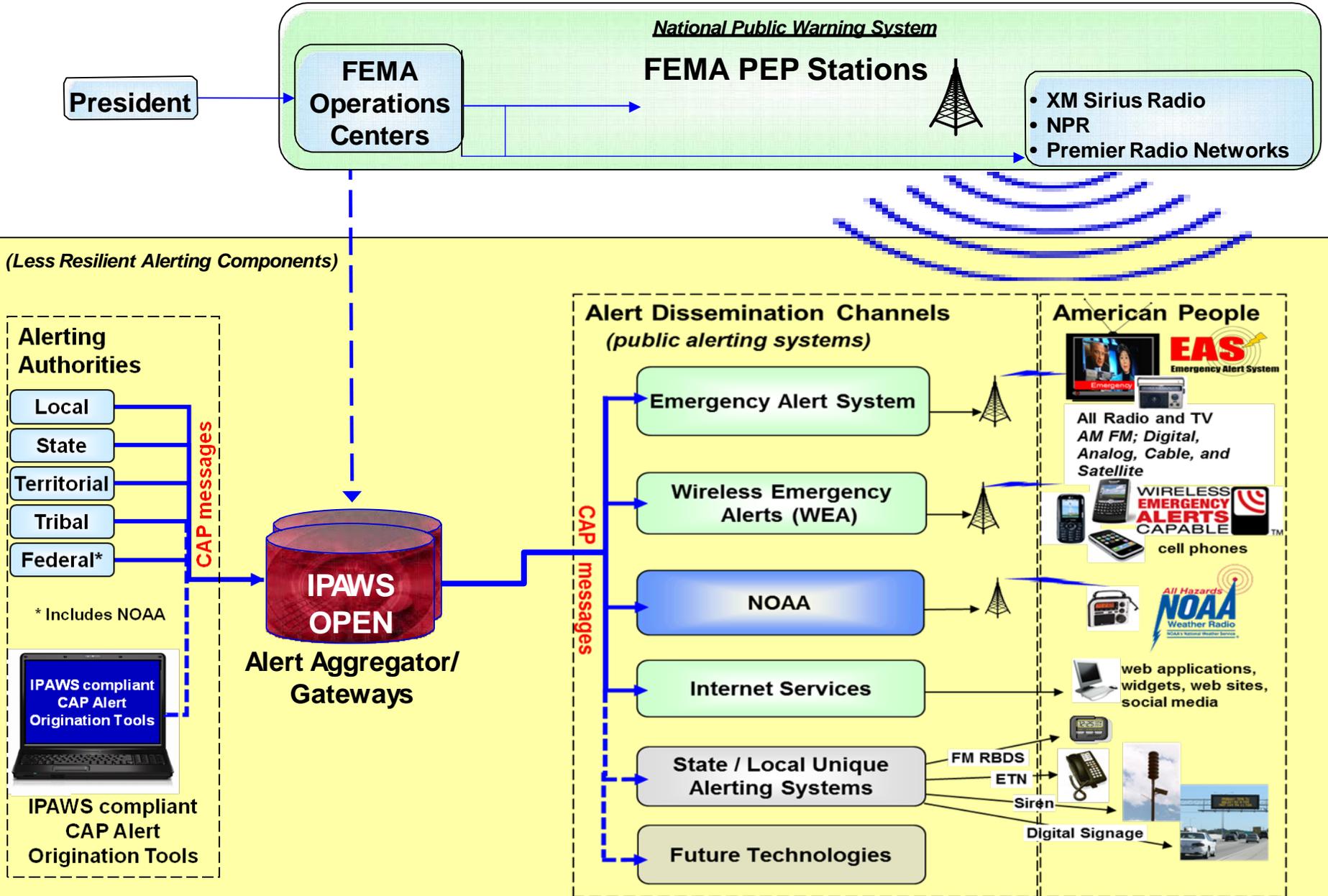
# What is IPAWS?

- ✓ IPAWS is a National System for Local Alerting
  - Supports sending geo-targeted alerts from local, state, tribal, and territorial officials during emergencies and from the President in the event of a catastrophic national emergency
  - Provides authenticated emergency alert and information messaging from public safety officials to the public through:
    - Radio and television via the Emergency Alert System (EAS)
    - Cellular phones via Wireless Emergency Alerts (WEA)
    - NOAA All Hazards National Weather Radio (NWR) via IPAWS-NOAA gateway
    - Internet applications and websites via the IPAWS All-Hazards Information Feed
- ✓ IPAWS is for:
  - Emergency alert and warning information
    - Anything public safety officials determine is a threat to public safety
    - It is not meant for messaging about changes to trash collection schedule
  - Alerting all citizens (including those with disabilities and others with access and functional needs) in a given area



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# IPAWS Architecture: A National System for Local Alerting



# When Can IPAWS Be Used?

- ✓ TORNADOS
- ✓ Evacuations
- ✓ Earthquakes
- ✓ Child Abductions/AMBER Alert
- ✓ Water Contamination
- ✓ Gridlock
- ✓ Water and Relief Supply Distribution
- ✓ Large Power Outages
- ✓ Toxic Plumes
- ✓ Volcano
- ✓ Shelter-In-Place
- ✓ Presidential Alerts
- ✓ Disaster Resources
- ✓ Wildfires
- ✓ Dam Breaks
- ✓ Chemical Spills
- ✓ Law Enforcement Situations
- ✓ Nuclear Accidents
- ✓ Road Outages/Closures
- ✓ Flash Flooding
- ✓ Snowstorms
- ✓ **Anything public safety officials determine is a threat to public safety**



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# Emergency Alert System Capabilities

Via IPAWS, in addition to traditional EAS state or local configurations



- ✓ Trigger TV and radio alerts
- ✓ FCC requires all licensees to monitor IPAWS All Hazards Information Feed
- ✓ Supports audio attachments (mp3)
- ✓ Supports audio links
- ✓ Supports text to speech



Photo Credit: Hans Yu/ FEMA



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# FEMA Primary Entry Point (PEP) Stations

- ✓ To satisfy requirement for a nationwide alert capability for warnings about a national catastrophic event, FEMA maintains relationships and equipment at a number of private sector radio stations across the US
- ✓ FEMA PEP stations include:
  - extended backup power generation system
  - special communication connections to FEMA
  - back up transmitter and EMP protection (newer stations only)
- ✓ IPAWS encourages planning and use of PEP stations in state and local disaster response
- ✓ Ask about FEMA PEP stations in your area
  - In coordination with the station owner, local public safety officials may leverage the more resilient infrastructure of the station for delivering local emergency information when the station is not being used for a national catastrophic emergency



**Photo by Lauren McFadden - Jun 28, 2011**  
Fresno, Calif., June 29, 2011 -- A Primary Entry Point Station used for supporting the Emergency Alert System. - Location: Fresno, CA



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# Wireless Emergency Alerts (WEA)

- ✓ Free
  - No cost to send or receive WEAs
- ✓ Not affected by network congestion
  - Uses SMS-Cell Broadcast (SMS-CB), a one-to-many service, to simultaneously deliver messages to multiple recipients in a specified area
  - Different channel than voice, SMS- Person to Person (SMS-PP), email, or web
- ✓ Used for imminent threats, AMBER, and Presidential alerts



- ✓ Geo-targeted
  - True location based alerting via broadcast from cell towers
- ✓ Non-subscription based
  - People who live, work, play, or visit do not need to sign up
  - Sends alerts to mobile devices in an area – not to a database of phone numbers
- ✓ Unique ring tone and vibration
  - Alerts “pop-up” on a cell phone

**IPAWS is the only way to send WEAs**



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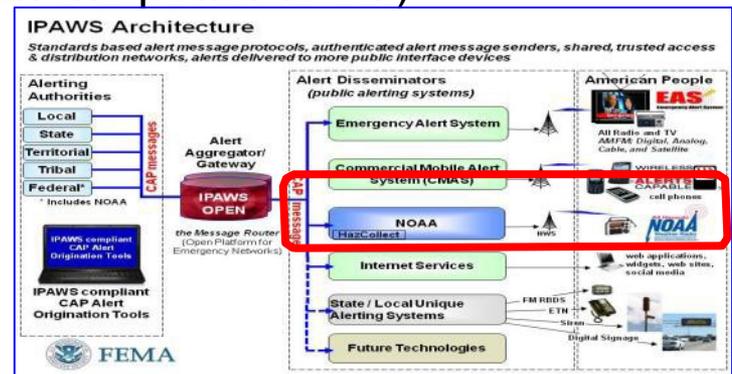


# NOAA All Hazards Weather Radio via IPAWS

- ✓ All-Hazards Emergency Message Collection System, or HazCollect interface, enables emergency alert messages from local alerting authorities to be broadcast over local NOAA Weather Radio transmitters directly from an IPAWS alert message
  - Permission to access HazCollect via IPAWS must be coordinated and approved through the NWS in coordination with your local National Weather Service Office  
(additional info at <https://www.nws.noaa.gov/os/hazcollect/>)



- ✓ NOAA Weather Radio Capabilities
  - Broadcast of Non-Weather Emergency Messages to local weather radios
  - 1000 transmitters nationwide (162.400-162.550 MHz)
  - Alert can “wake up” weather radio in the middle of the night
  - Radios include battery back-up (work when the power is out)
  - Most schools have weather radios

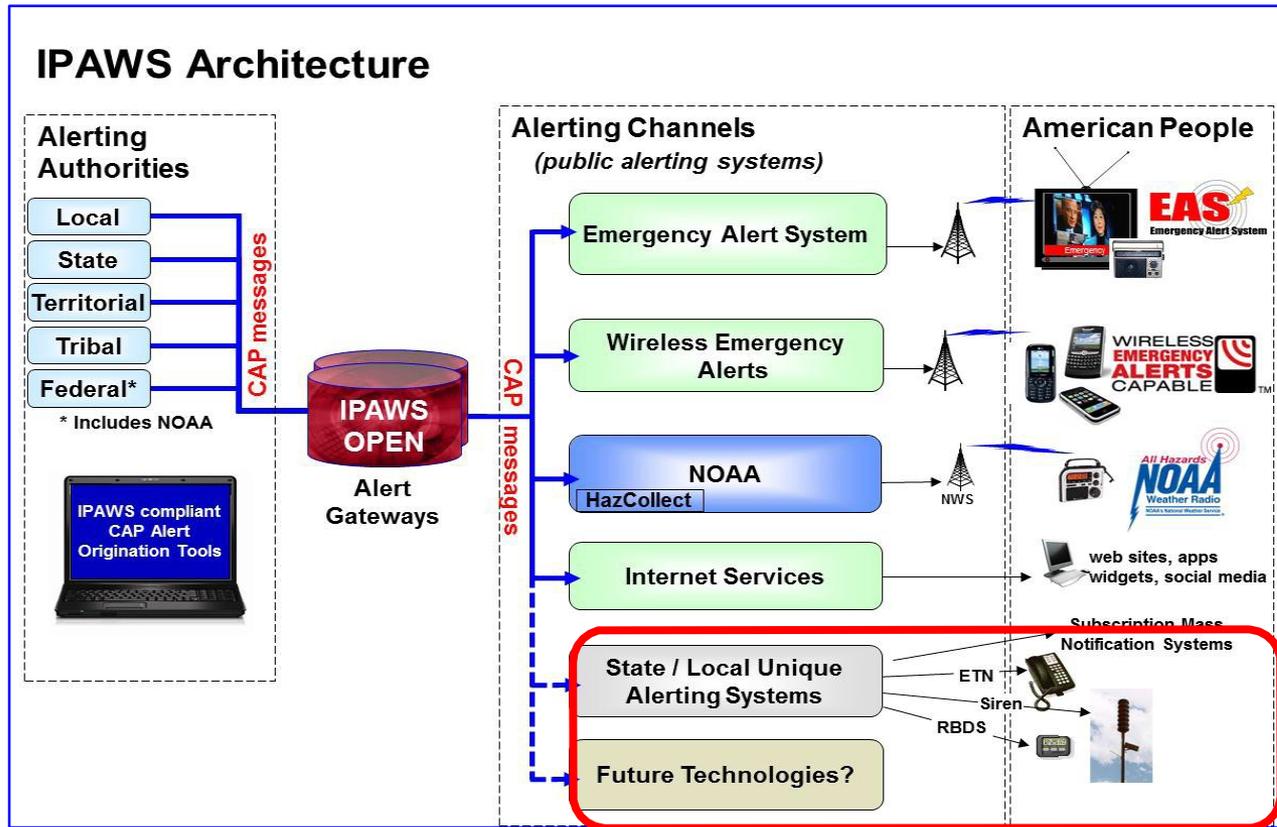


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Photo Credit: Jocelyn Augustino/ FEMA

# Local, Unique, and Future Technologies

All interoperation with IPAWS is based upon an open and internationally recognized message exchange data standard, the Common Alerting Protocol (CAP); existing and future technologies that communicate through internet channels and CAP can be programmed to interoperate with IPAWS



- ✓ Local and unique systems
- ✓ Sirens
- ✓ Digital road signs
- ✓ Text-to-Braille translators
- ✓ Subscription mass notification systems
- ✓ Emerging technologies



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# How to Adopt IPAWS

[www.fema.gov/alerting-authorities](http://www.fema.gov/alerting-authorities)

## ✓ **Application Process for COG-to-COG Alerting Access**

- (1) Acquire IPAWS-Compatible Alert Software
- (2) Apply for a Memorandum of Agreement with FEMA
- (3) Install Digital Certificate on System
- (4) COG System Ready to Exchange Messages with Other COGs. The COG will now be able to exchange messages with other IPAWS COGs

## ✓ **Application Process for Public Alerting Access**

If a COG requires access to public alerting in addition to COG-to-COG messaging, the following additional steps must be completed

- (1) Complete IPAWS Public Alerting Application
- (2) Submit Public Alerting Application to Designated State Official
- (3) Complete IS-247.a—IPAWS Web-based Training (WBT)
- (4) Submit State-Approved Public Alerting Application and IS-247.a Certificate of Completion to IPAWS

The COG's public alerting permission will now be enabled in IPAWS and the COG will be able to issue public alerts to the authorized area

- ✓ Go to [www.fema.gov/informational-materials](http://www.fema.gov/informational-materials) for a detailed checklist for adopting IPAWS



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**All IPAWS COGs have *COG-to-COG* alerting access; not all IPAWS COGs have *public* alerting access**

# Digital Library of Alert and Warning Resources

- ✓ Wireless Emergency Alerts (WEA) FAQs
- ✓ Alerting Authorities FAQs
- ✓ EAS Best Practices Guide
- ✓ Fact Sheets
  - **IPAWS Open Platform for Emergency Networks (IPAWS-OPEN)**
  - **Common Alerting Protocol (CAP)**
  - **Emergency Alert System (EAS)**
  - **Wireless Emergency Alerts (WEA)**
  - **How to Sign Up for IPAWS**
  - **All-Hazard Alerting**
  - **AMBER Alerts**
  - **Alerting Americans with Disabilities and Others With Access and Functional Needs**
  - **IPAWS and the American People**
- ✓ Games and worksheets for kids
  
- ✓ All resources can be found at [www.fema.gov/ipaws](http://www.fema.gov/ipaws) or [www.fema.gov/informational-materials](http://www.fema.gov/informational-materials)



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# Testing with the IPAWS Lab

- ✓ The IPAWS Lab supports state and local alerting tool evaluation, demonstration, exercises and testing



Photo Credit: Hans Yu/ FEMA

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# 16 Approved Symbols

IPAWS WEA Event Code	Category or Sub- Category	SYMBOL
<b>AVW</b>	Avalanche Warning	
<b>BZW</b>	Blizzard Warning	
<b>CAE</b>	Child Abduction Emergency	
<b>CEM</b>	Civil Emergency Message	
<b>DSW</b>	Dust Storm Warning	
<b>EQW</b>	Earthquake Warning	
<b>FRW</b>	Fire Warning	
<b>FFW</b>	Flash Flood Warning	

IPAWS WEA Event Code	Category or Sub- Category	SYMBOL
<b>FLW</b>	Flood Warning	
<b>HUW</b>	Hurricane Warning	
<b>LEW</b>	Law Enforcement Warning	
<b>NUW</b>	Nuclear Power Plant Warning	
<b>EAN</b>	Presidential Emergency Alert Notification	
<b>RHW</b>	Radiological Hazard Warning	
<b>SPW</b>	Shelter in Place Warning	
<b>TOR</b>	Tornado Warning	



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# AMBER ALERT: PASCO, WASHINGTON



**WIRELESS EMERGENCY ALERTS IN ACTION**

A Pasco resident was pulling into a Wendy's parking lot when he received an AMBER Alert on his phone.

He spotted the vehicle featured on the AMBER Alert and called 911.

Two girls, who had been in the backseat of the stolen vehicle, were reunited with their families.

<http://q13fox.com/2015/12/14/pasco-man-gets-amber-alert-on-his-phone-just-as-hes-parking-next-to-car-in-question/> (December, 2015)



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# For More Information

IPAWS Inbox: [IPAWS@fema.dhs.gov](mailto:IPAWS@fema.dhs.gov)

IPAWS Website: <http://www.fema.gov/ipaws>

IS-247.a Integrated Public Alert and Warning System (IPAWS):  
<http://training.fema.gov/EMIWeb/IS/courseOverview.aspx?code=IS-247.a>

IS-248 Integrated Public Alert and Warning System (IPAWS):  
<http://training.fema.gov/EMIWeb/IS/courseOverview.aspx?code=IS-248>

IS-251 Integrated Public Alert and Warning System (IPAWS):  
<http://training.fema.gov/EMIWeb/IS/courseOverview.aspx?code=IS-251>



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## EMERGENCY MANAGEMENT DIVISION

A Disaster Resilient Washington State

### EMERGENCY ALERT SYSTEM

Civil Authorities

Issued a

Civil Emergency Message



## Emergency Alert System

Clay Freinwald

State Emergency Communications Committee Chair

September 27, 2018



## EMERGENCY MANAGEMENT DIVISION

*A Disaster Resilient Washington State*

### Emergency Alert System (EAS)

- Jointly coordinated by the Federal Communications Commission (FCC), Federal Emergency Management Agency (FEMA), and the National Weather Service (NWS)
- Designed for President to speak to American people within 10 minutes
- Provided for better integration with NOAA weather and local alert distribution to broadcasters
- Founded in Code of Federal Regulations 47 Part 11
- Defined in Washington State EAS Plan





## EMERGENCY MANAGEMENT DIVISION

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# Washington State EAS Plan

- Organized in Tabs
- State Emergency Communications Committee
- Local Emergency Communications Committees
- Operational Areas
- Event Codes
- Required Monthly Tests

<https://www.mil.wa.gov/other-links/emergency-alert-system-eas-state-plan>



## EMERGENCY MANAGEMENT DIVISION

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### Event Codes



<u>Event Code</u>	<u>Event Description</u>
ADR	Administrative Message
AVA	Avalanche Watch
AVW	Avalanche Warning
CAE	Child Abduction Emergency
CDW	Civil Danger Warning
CEM	Civil Emergency Message
EQW	Earthquake Warning
EVI	Evacuation Immediate
FRW	Fire Warning
HMW	Hazardous Materials Warning
LAE	Local Area Emergency
LEW	Law Enforcement Warning
NUW	Nuclear Power Plant Warning
RHW	Radiological Hazard Warning
RMT	Required Monthly Test
RWT	Required Weekly Test
SPW	Shelter In-place Warning
TOE	911 Telephone Outage Emergency
VOW	Volcano Warning



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## Operational Areas

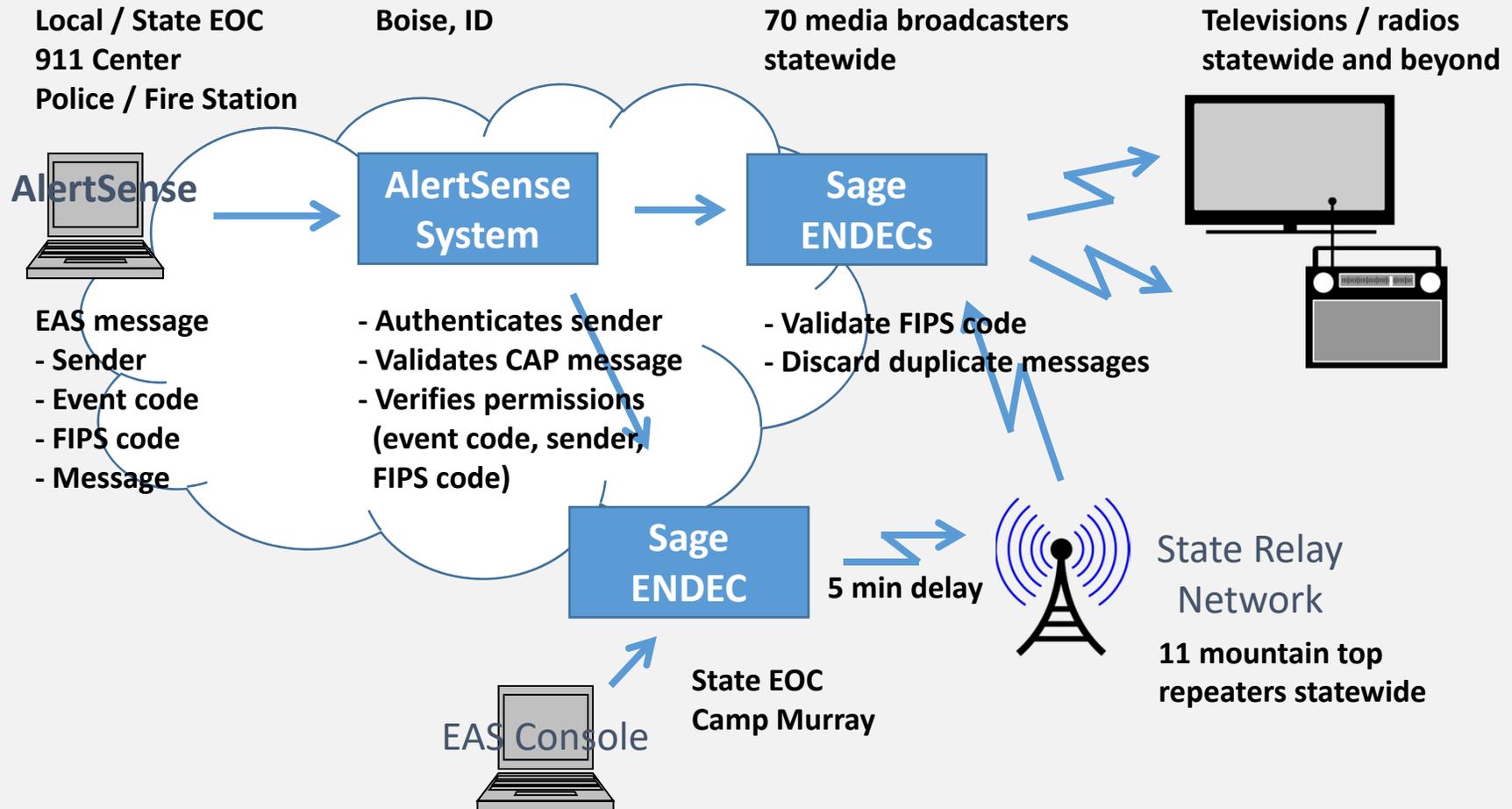




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# Emergency Alert System in WA aka WA CAP System

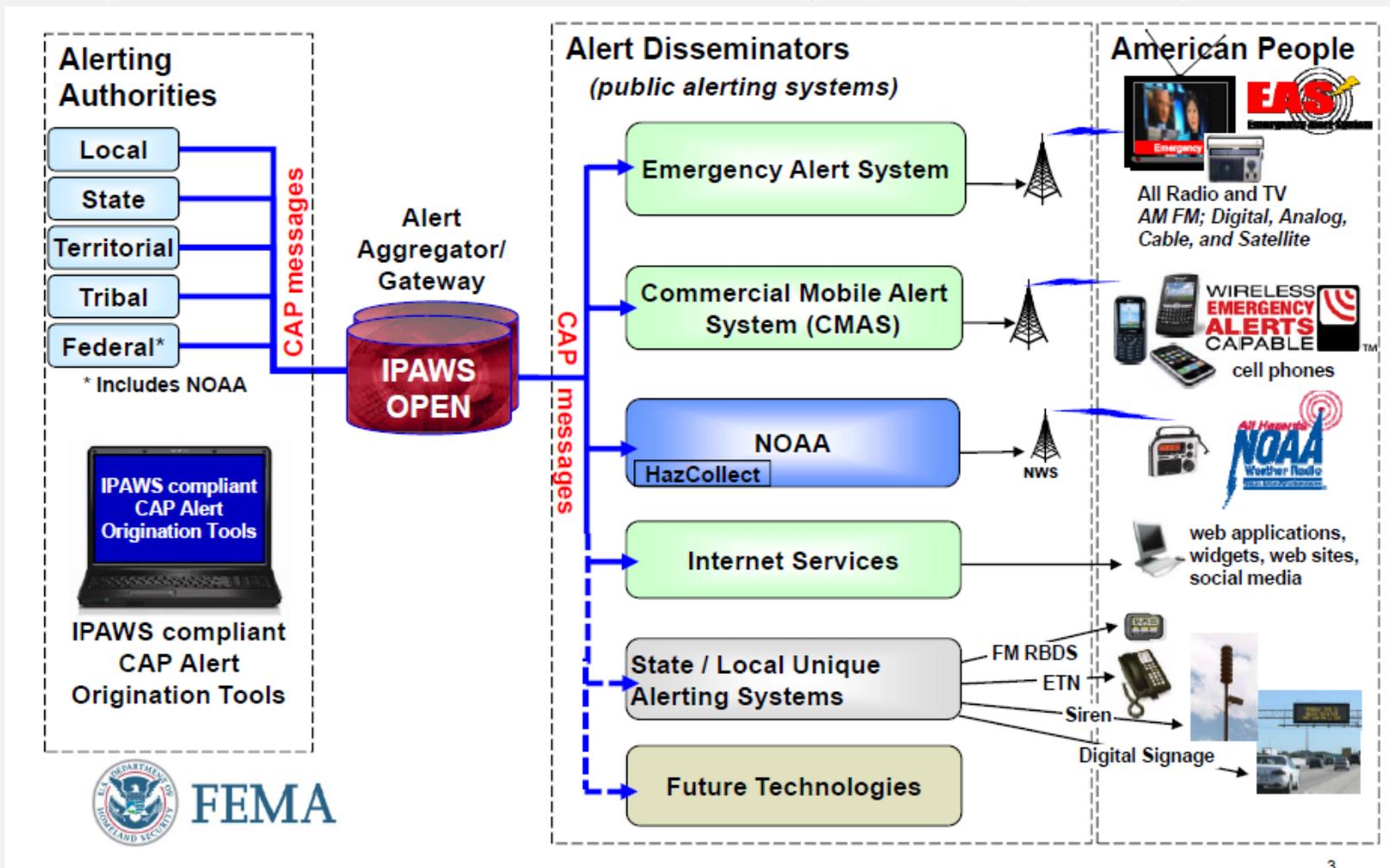




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## Integrated Public Alert and Warning System (IPAWS)





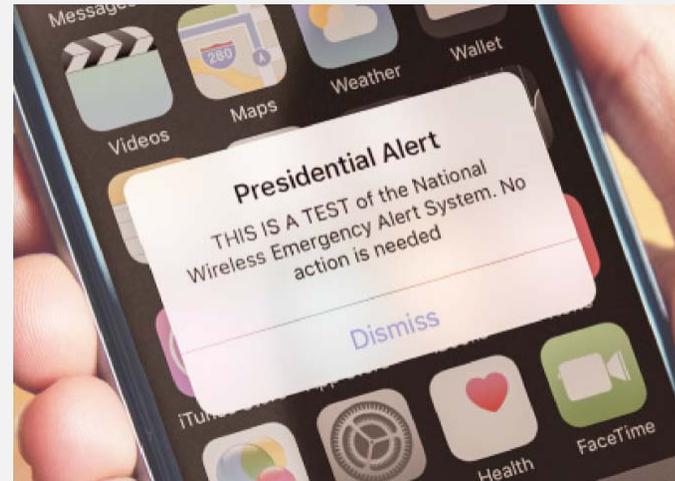
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### The IPAWS National Test

The Federal Emergency Management Agency (FEMA), in coordination with the Federal Communications Commission (FCC), will conduct a nationwide test of the of the Emergency Alert System (EAS) and Wireless Emergency Alert (WEA) system on October 3.

Sending the WEA message will begin at 11:18 AM PDT. The EAS message will be sent at 11:20 AM PDT.





## EMERGENCY MANAGEMENT DIVISION

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# What Can You Do?

- **Participate**
  - **SECC Meetings**
    - **Bi-Monthly – Choices: In-Person, Via Conf Call/Skype**
  - **Your LECC**
    - **See Tab 2 of the State EAS Plan**
    - **Contact Your LECC Chair – Get Involved**
      - **Better Meet Your Needs**
  - **State EAS Remailer**
    - **To Join - <http://sea.sbe16.org/mailman/listinfo/secc-wa>**
    - **EAS/WEA topics/questions addressed**
    - **SECC meeting announcements and minutes**





## EMERGENCY MANAGEMENT DIVISION

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# Questions??

- Clay Freinwald – Washington SECC Chair
  - [k7cr@blarg.net](mailto:k7cr@blarg.net)
- Resources
  - Washington State EAS Plan
    - <https://mil.wa.gov/other-links/emergency-alert-system-eas-state-plan>
  - EAS/WEA Event Code Meanings/Priorities
    - <https://mil.wa.gov/uploads/pdf/EAS-state-plan/eas-tab-8-event-codes-7.28.18.pdf>



# Washington State 911 Coordination Office & Washington Emergency Management

Andy Leneweaver, Deputy State 911 Coordinator

September 27, 2018





# Washington State 911 System



While 911 isn't really Emergency Management, the state Comprehensive Emergency Management Plan relies upon the Public Safety Answering Points (911 centers) for initial situational awareness.

**Note: There hasn't been a recent emergency or disaster where 911 hasn't provided the first indication.**



# Washington State 911 System



In Washington State today,

911 is a coordinated, cooperative system,

From the Call-Maker to the Call-Taker

And consists of 3 buckets of responsibility





# Quick History of WA STATE 911



- 1968: “9-1-1” as an emergency number began in Alabama
  - 50<sup>th</sup> Anniversary celebrated February 16th
- 1969: Puyallup became first locality west of the Mississippi in the lower 48 to have a 911 call center
  - (Now called Public Safety Answering Points – PSAPs)
- 1985: King County implemented first Enhanced 911 system in the state
- 1991: “Referendum 42” – “Shall Enhanced 911 emergency telephone dialing be provided throughout the state and be funded by a tax on telephone lines?” Passed Yes 61%, No 39%
- 1992: STATE ENHANCED 911 COORDINATION OFFICE (SECO) established to assist and facilitate statewide Enhanced 911 implementation
- 1996: Congress passes “Telecommunications Act of 1996”
  - (addressed 9-1-1 at national level)

**Washington State: A consistent national leader in development and refinement of 911 services**



# A Quick History of WA STATE 911

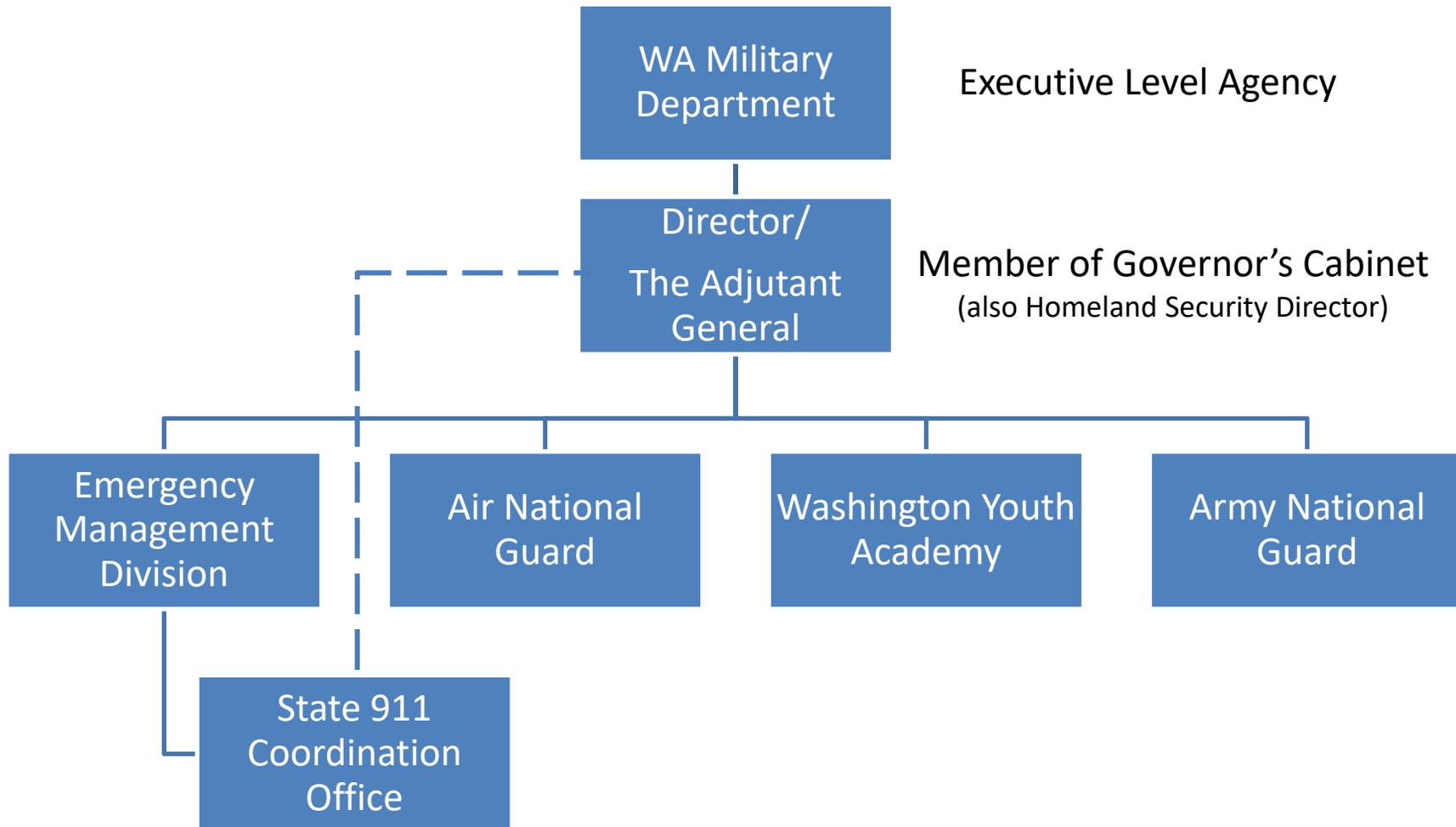


- 1998: Statewide migration to Enhanced 911 begins – physical address/other info displayed for call-taker, selective routing to correct PSAP
- 2001-2003: Next Generation 911 (NG911) concept developed to move 911 beyond Enhanced 911.
- 2008: Washington State decides to move to NG911 by 2015
- 2009: Migration to NG911—first step—interim Emergency Services Internet Protocol (ESInet) buildout begins – IPSR – ESInet completed in 2012
- 2013-2016: PSAPs begin converting to NG911 capable Call Processing Equip.
- 2014: SECO begins work to acquire a fully capable NG911 ESInet (II) that is designed to transport Calls, Text, data, Images & Video.
- 2016: Apparent Successful Bidder announced. Work begins on NG 911
- 2019: End-state is a NENA i3 (+) Standard Statewide NG911 ESInet

**Washington State: A consistent national leader in development and refinement of 911 services**

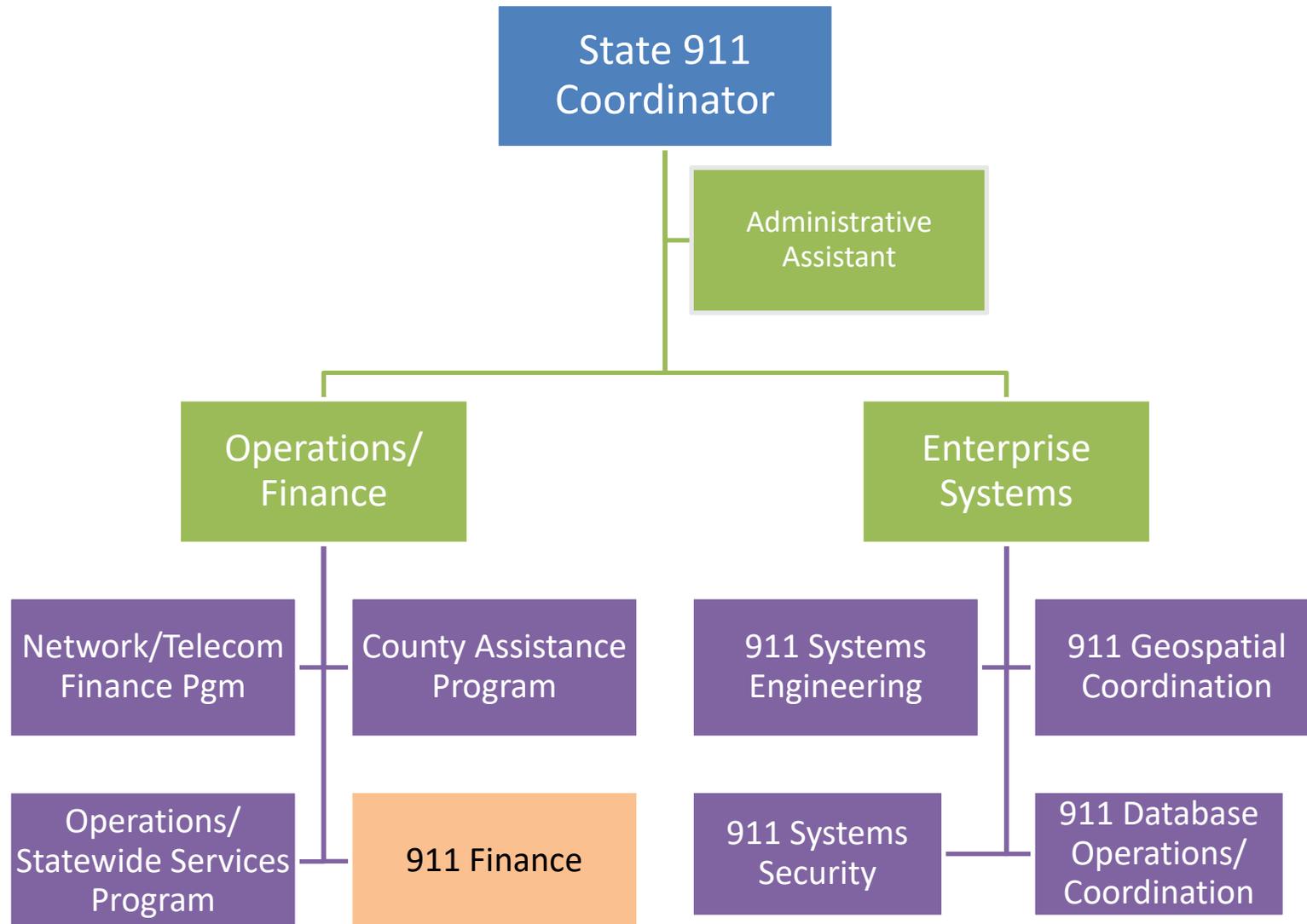


# Washington Military Department





# Washington State 911 Coordination office





# Washington State 911 Coordination office



- Statewide Services - Provided on behalf of all counties
  - Statewide 911 System
  - Tele-communicator Training
  - Language Translation Services
  - TTY/TDD Support and Training
  - Technical Support
- Financial Support to Maintain a Baseline Level of Service
  - Support based on amount of local excise tax revenue
  - County / WSP Contracts for some operational costs
  - Capital equipment replacement (when/if funds available)
- Coordinator Professional Development - Provided to all counties
  - Training, coordination, and NG modernization



# Revised Code of Washington (RCW) Washington Administrative Code (WAC)



- 911 RCWs - Chapter 38.52.500 thru 38.52.577
  - Statewide Enhanced 911 Service
  - State Enhanced 911 Advisory Committee
    - Representing: NENA-WA, APCO-WA, various WA Law, Fire & EMS Associations, various WA city & county associations, large & small wireline & wireless providers, VOIP providers, the WA UTC and the WSP
- 911 Tax RCWs - Chapter 82.14B.030 thru 82.14B.210
  - Establishes Tax on Telephone Access Line Use
  - To be used only for the emergency services communication system
- 911 WACs – Chapter 118-66-010 thru 118-68-090
  - 118-66 – Defines/describes 911 Funding and eligibility
  - 118-67 – Defines/describes uniform technical and operational standards for wireless 911 calls
  - 118-68 – Defines/describes Automatic Location Information



# E911 Funding



- E911 excise tax imposed on all switched access lines
  - (wireline, wireless, VOiP, Pre-Paid Cards/Services)
- All 39 Washington Counties have established local dedicated E911 funds for collection of local excise tax.
  - Rate established at \$.70 per line (maximum)
- Dedicated state Enhanced 911 fund (O3F) established in 1998.
  - Rate established at \$.25 per line (maximum)
  - SFY2018 revenue = \$26,094,325
  - SFY2019 forecast revenue = \$26,628,000



## State Funding of 911 in SFY 2018



- State Office Costs \$1,795,290 (7%)
- Statewide Services \$592,341 (2%)
- Advisory Committee \$13,047 (0.1%)
- Statewide NG911 Net \$14,719,809 (56%)
- County Contracts \$8,973,838 (34%)
  - Operations County Support – 19 Counties
  - Coordinator Professional Development – 20 Counties



# Evolving Nature of 9-1-1 Calls



## 17 Years ago (2000):

- 73% of 9-1-1 calls came from Landlines
  - 27% came from 'Cell Phones'
  - 0% came from VoIP

## Last Year (SFY 2017):

- 13% of 9-1-1 calls came from Landlines
  - 81% come from 'Cell Phones'
  - 6% come from VoIP



# Washington State 911 Statistics



- FY17 – 911 Calls for service
  - Statewide Total Year = 6,699,977 (-1%)
  - Average Per Day = 18,356
  - Average Per Hour = 765
  
- FY17 – 911 Calls by Service Type
  - 13% Wireline = 853,718 (-9%)
  - 81% Wireless = 5,448,361 (+.01%)
  - 6% VoIP = 397,898 (+8%)
  
- FY17 - 8,525,824 phone subscribers statewide
  - 14 % Landline = 1,219,727 (-1%)
  - 13% VOIP = 1,113,677 (+1%)
  - 62% Wireless = 5,304,898
  - 10% Pre-Paid Wireless = 887,522

\*Percentages shown in comparison to FY16 numbers



# Status of Text-2-911



As of: 19 April 2017

\* Not all carriers provide Text-to-911 service in all counties where PSAPs provide Text-to-911 service.



# Modernizing the ESInet



- Nationally Standardized System =
  - Compatible with All PSAPs (Intra and Interstate)
- Enhanced Call-Type capabilities (Voice, Text, Data, Imagery, etc.) =
  - Accessibility
- Enhanced Network Reporting, Monitoring and Troubleshooting Displays (We can see our network working and allows for immediate action in event of an outage) =
  - Recoverability, Situational Awareness/Insight
- Enhanced Geo-diversity (Dual pathways, Active/Active Processing) =
  - Resilience
- Transition to true geo-location validation and call-routing =
  - Accuracy of Caller location (even if caller is on the move)
- Single Data Set (instead of multiple data bases) =
  - Simplified Processes
- Enhanced Service Level Agreements =
  - Assured Reliability



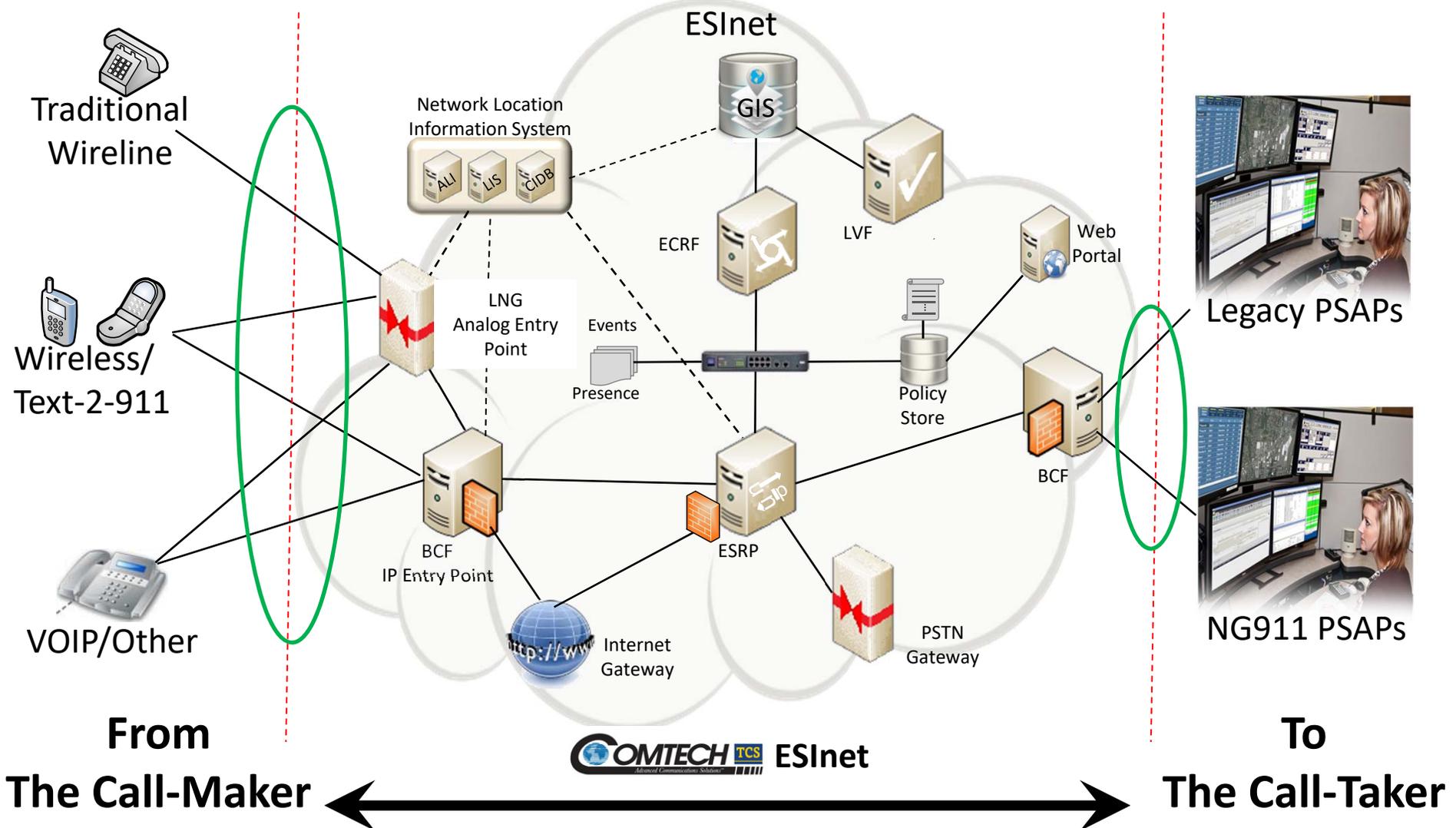
# The Washington State Next Generation 911 System

← The Contract is for This →

Originating Network

The Emergency Service IP Network

Terminating Network



Traditional Wireline

Wireless/Text-2-911

VOIP/Other

Network Location Information System



ESInet



ECRF



LNF

Web Portal

LNG Analog Entry Point

Events Presence

Policy Store

Legacy PSAPs

BCF IP Entry Point

ESRP

BCF



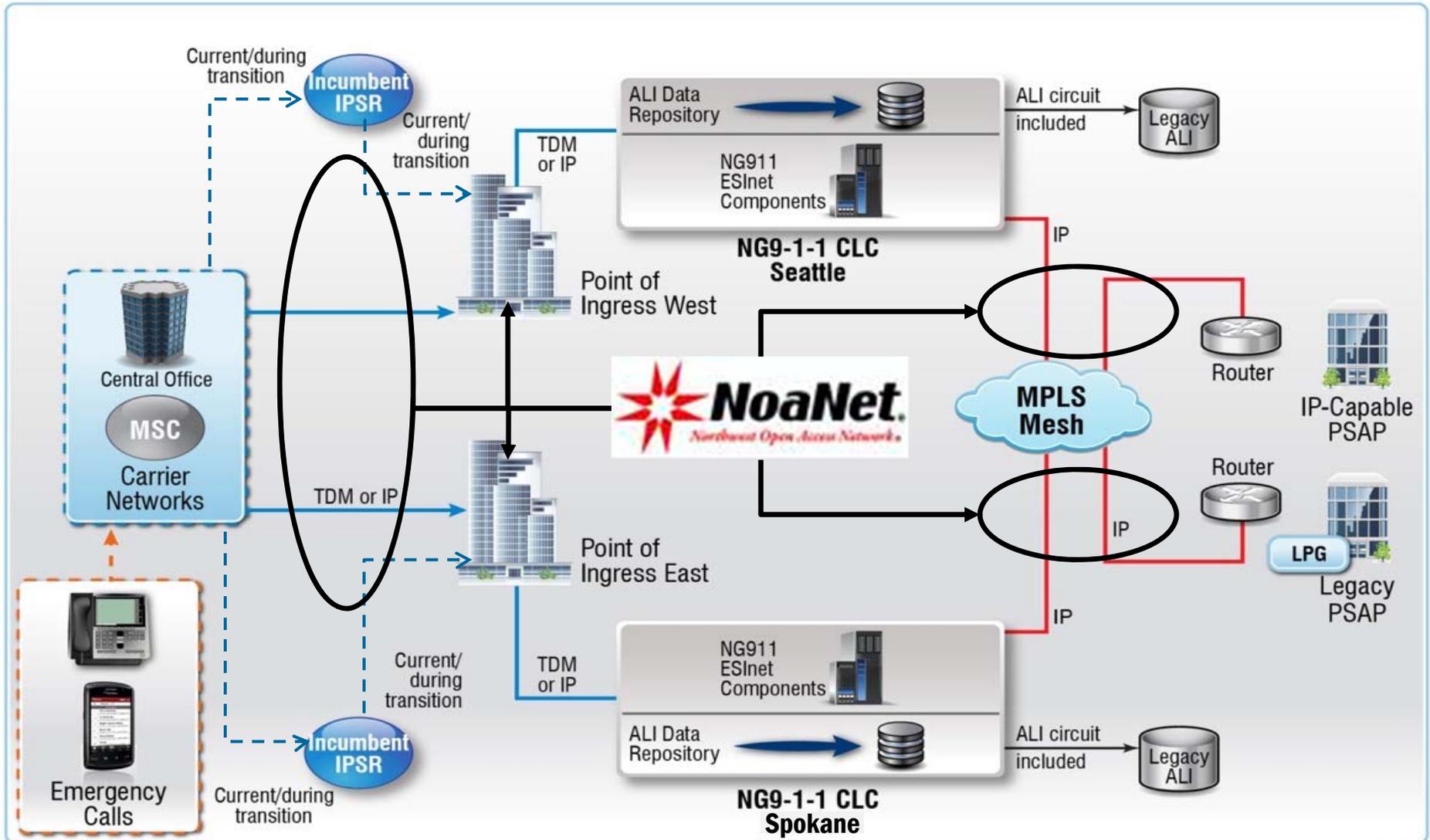
NG911 PSAPs

Internet Gateway

PSTN Gateway

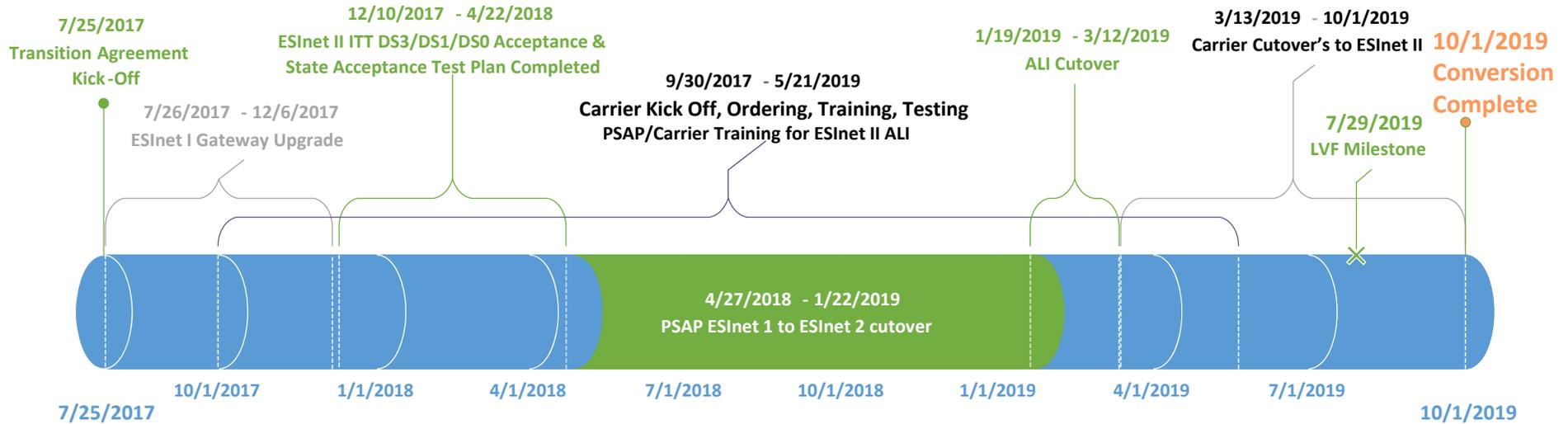


# Transition Overview





# High Level Timeline: SoWA ESInet II conversion



**Transition Kick Off**

- Amendments and SOW Complete

**ESInet I Gateway Upgrade**

- West Upgrade of ESInet I for Comtech Interconnection
- Comtech and West ALI Interconnection Upgraded and ALI 04-001 Inter-Operability Testing Performed

**ESInet II ITT**

- Intertandem Trunk Testing and Acceptance
- Acceptance Test Plan Executed, Completed, Accepted

**Carrier Kick-Off**

- Provide Ingress Details and ICDS
- Map Carrier Capacity Requirements
- Kick-Off Interconnection Orders
- Test New Circuits
- Provide ALI training to Carriers and PSAPs

**ESInet II ALI Migration**

- Upload ALI data
- Migrate PSAPs to ESInet II ALI
- Carriers and PSAPs start using Comtech ALI

**Carrier Cutover**

- Carriers Migrate Traffic from ESInet I Interconnection to ESInet II



# The next episode... what are we getting?



- NENA i3-based ESInet
  - Defined in NENA 08-003/STA-010
  - Continued support for Interim RFAI and Legacy CAMA
- Major Features
  - Media agnostic (voice, txt, video, pictures, telematics, etc.)
  - Geospatial call routing and location validation
  - Extensive Policy Routing...see next slide
  - Stringent and comprehensive SLAs with Remedies that will hurt
  - Extensive reporting capabilities
  - Enhanced monitoring and troubleshooting capabilities
    - Quality per call
    - Monitoring dashboard...shows status of network and components at glance
  - Elimination of ALI (eventually)
- Completion October 2019

**Next Generation is Now!**



# 911 – The **First** First Responder





# 911 TRIVIA: “Did you Know?”



- You can use your old cell phone to dial 911!
- Britain implemented the “999” emergency number in 1937
- Indonesia- Dial 118 or 119 for general emergency, and...
  - 115- for Search & Rescue
  - 129- for a Natural Disaster