



Integrated Public Alert and Warning System

Get Alerts, Stay Alive

39th Conference on Broadcast Meteorology
Conference on Storm Warnings and Communication



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June 24, 2011

The Evolution of Emergency Alerting



Originally called the “Key Station System,” the **CONTROL** of **ELECTROMAGNETIC RADIATION** (CONELRAD) was established in August 1951.

Participating stations tuned to 640 & 1240 kHz AM and initiated a special sequence and procedure designed to warn citizens.

EBS was initiated to address the nation through audible alerts. It did not allow for targeted messaging.

System upgraded in 1976 to provide for better and more accurate handling of alert receptions.

Originally designed to provide the President with an expeditious method of communicating with the American Public, it was expanded for use during peacetime at state and local levels.

EAS jointly coordinated by the FCC, FEMA and NWS.

Designed for President to speak to American people within 10 minutes.

EAS messages composed of 4 parts:

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

Provided for better integration with NOAA weather and local alert distribution to broadcasters

IPAWS modernizes and integrates the nation’s alert and warning infrastructure.

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

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



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IPAWS Vision

“Timely Alert And Warning To American Citizens In The Preservation of Life And Property”

Integration of public alert communications systems:

- ▶ Facilitate single emergency alert message delivery to all available public dissemination channels
- ▶ Easier to use for alerting authorities



Alerting Authorities;
Local, State, Territorial,
Tribal, and Federal



IPAWS-OPEN
“Alert Aggregator”



Television



Radio



Cell Phone



Computer



Home Phone



Public Signage

- ▶ *Improves and Enhances* emergency alerting capability in two critical ways:

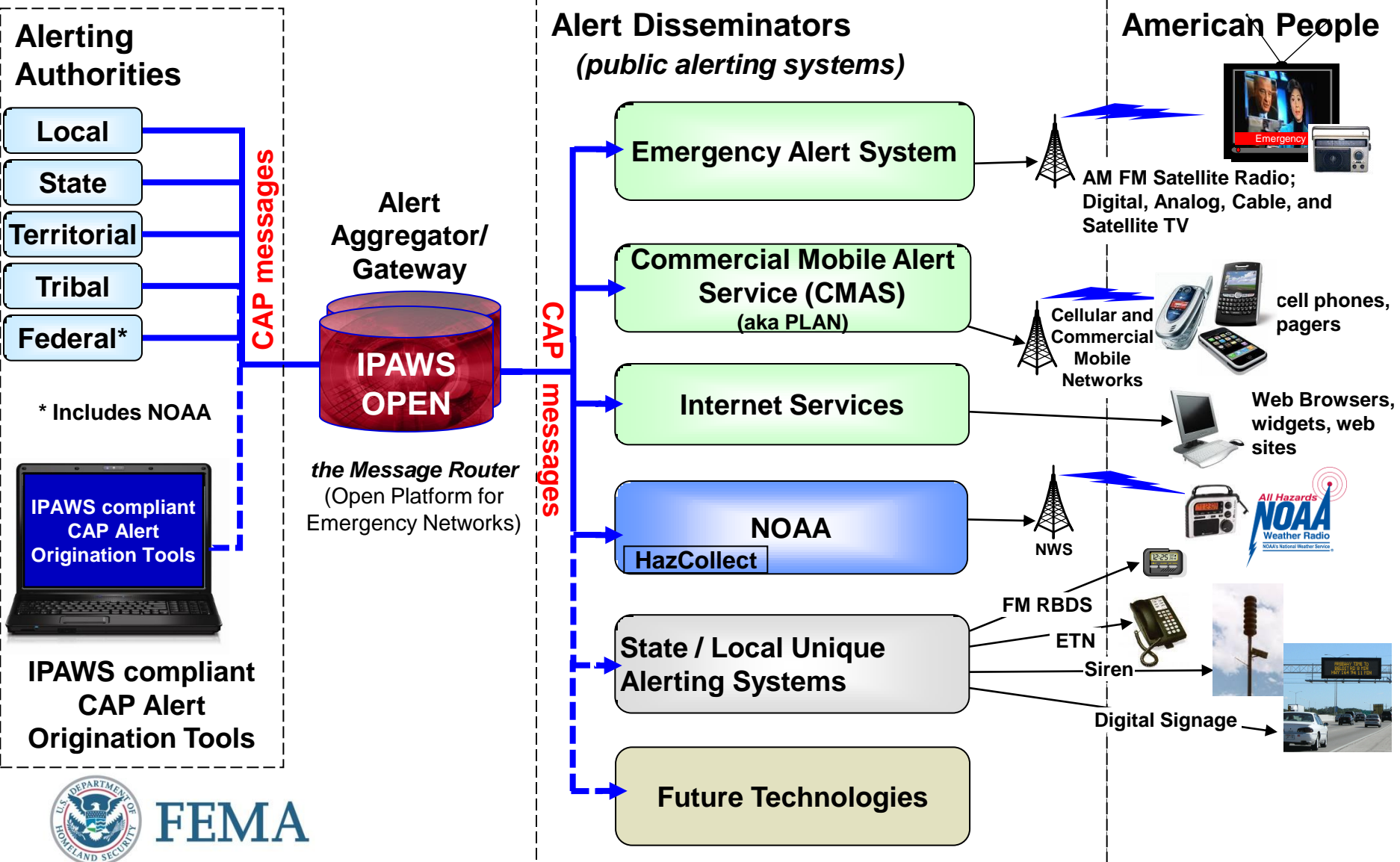
- increases reliability that affected citizens receive an alert via at least one path
- increases likelihood that citizens reacts to emergency alerts



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IPAWS Architecture

Standards Based Alert Message protocols, authenticated alert message senders, shared, trusted access & distribution networks, alerts delivered to more public interface devices





IPAWS Component: Emergency Alert System (EAS)



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Emergency Alert System

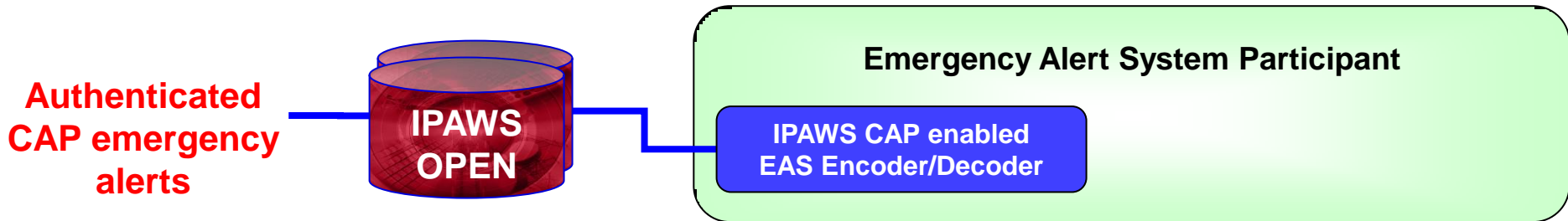
- ▶ All hazards, all contingencies component of IPAWS
- ▶ National EAS provides the President a capability to address the nation across all broadcast networks in the event of a national emergency
 - Broadcasters (all TV and radio) participate as a condition of their broadcasting license and rules in C.F.R. 47 Part 11
- ▶ EAS may be used by State and Local authorities when not in use by President
 - Broadcasters not required, **but most do**, participate in State and Local alerting,
- ▶ System is composed of:
 - FEMA PEP stations (or National Primary stations)
 - Commercial radio stations with FEMA installed communications equipment for direct connection to FEMA, and resiliency enhancements
 - State and Local EAS networks and plans
 - State Primary and Local Primary Stations
 - automated devices* installed in all other broadcast stations
 - monitors PEP for broadcast of and automatically relays Presidential messages
 - May also be used to monitor local, state, NOAA sources for alert and warning information

* Broadcasters required to install IPAWS CAP compliant equipment this year



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IPAWS Architecture; EAS Component using CAP



- **Encoder/Decoder monitors IPAWS OPEN (via IP connection) for appropriate emergency alerts**
 - Appropriate alerts defined by Broadcaster policies in coordination and cooperation with local public safety officials... within bounds of CFR Part 11 and State and Local EAS Plans
- **Encoder/Decoder converts appropriate alerts to standard EAS**
 - Following CAP to EAS Implementation Guide developed by the EAS-CAP Industry Group (ECIG)
- **EAS messages broadcast**

- **CAP does not make audio relay of EAS alerts obsolete!**
- **CAP augments and adds resilience to alert distribution**



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National EAS Test

- ▶ Date for nationwide test is November 9, 2011
- ▶ **Test is “traditional” EAS only** – not CAP or other IPAWS capabilities at this time
- ▶ Test includes:
 - origination of a live test message with the national Emergency Alert Notification (EAN) header from FEMA to the Primary Entry Point (PEP) stations
 - PEP station will broadcast the live test message
 - All EAS participants should receive message and relay the broadcast nationwide
- ▶ The test will last approximately three minutes and contain EAS header tones followed by two and a half minutes of audio message and end of message notification tones
- ▶ EAS Participants receive and relay the broadcast EAN test message
- ▶ Test provides real-world environment to evaluate the following:
 - Origination of a National-level Emergency Action Notification (EAN) over EAS
 - State EAS plans and monitoring assignments
 - EAS audio relay system
 - Public reaction and familiarization with the National EAS

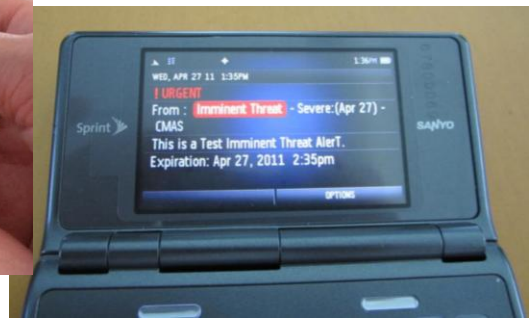


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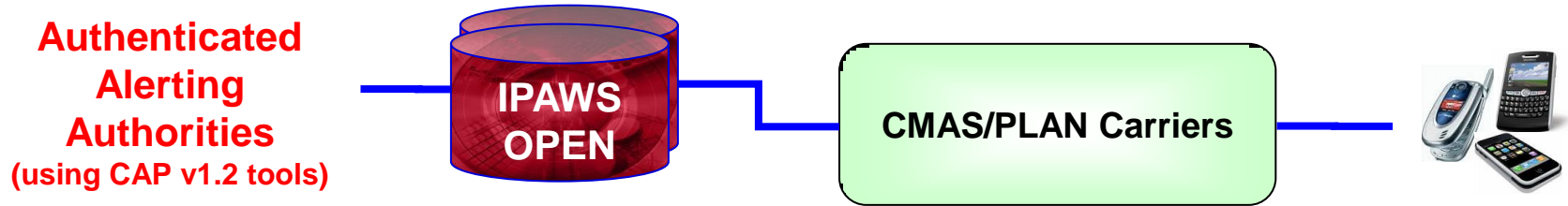
Commercial Mobile Alert System (CMAS)

Also known as: PLAN, Personal Localized Alerting Network



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Commercial Mobile Alert System (CMAS) / Personal Localized Alerting Network (PLAN):



- ▶ Capability to send 90 character, geographically targeted, emergency alerts to cellular phones in a danger zone
- ▶ Significantly Different from SMS/email based alerting systems
 - **Not subscription based** -- true location based alerting
 - i.e. alerts to phones in an area - not to a database of phone numbers
 - **for “Alerts” only**.... not for notification type messages
 - only for emergency categorized as:
 - Imminent Threat
 - Amber / Child Abduction Emergency
 - Presidential
 - Uses “cell broadcast” technology to avoid network congestion
 - Free to alerters and alertees – no usage or text message charges
- ▶ Cellular carrier participation voluntary (opt-in)
 - 142 carriers have filed their intent to participate
- ▶ Citizens may opt-out of receiving alerts

CMAS/PLAN Milestones & Activities

- ▶ Commercial Mobile Alerting System Interface Specification (Completed – Dec 2009)
 - Joint ATIS/TIA CMAS Federal Alert Gateway to CMSP Gateway Interface Specification, J-STD-101, October 2009
- ▶ FEMA memorandum of agreement with 5 major carriers
 - Sprint, T-Mobile, AT&T, Verizon Wireless, US Cellular
 - Initial interface testing ongoing (completed with Sprint)
- ▶ FEMA IPAWS-OPEN gateway function (end-to-end) initial operational capability online in August 2011
- ▶ Early roll-out, with Sprint, T-Mobile, AT&T, Verizon Wireless, to New York City and Washington DC areas planned for Dec 2011
- “roll-out” of capabilities to other areas, dependent on participating carriers



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Comments and Questions

▶ **IPAWS Website** - <http://www.fema.gov/emergency/ipaws>



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IPAWS Program Federal Guidance -

Executive Order 13407 states:

“It is the policy of the United States to have an effective, reliable, integrated, flexible, and comprehensive system to alert and warn the American people...”

“establish or adopt, as appropriate, common alerting and warning protocols, standards, terminology, and operating procedures for the public alert and warning system to enable interoperability and the secure delivery of coordinated messages to the American people through as many communication pathways as practicable...”

“administer the Emergency Alert System (EAS) as a critical component...”

“ensure that under all conditions the President of the United States can alert and warn the American people.”

1995 Presidential EAS Statement of Requirements states:

“The national level EAS must be: Fully integrated from the national to local level, yet capable of independent local (Priority Two) and state (Priority Three) operations”

**The IPAWS Program Management Office was formed to implement
Executive Order 13407**



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IPAWS Program Related; Federal Regulation and Statutory Guidance

CFR 47 Part 11 — EMERGENCY ALERT SYSTEM (EAS)

rules and regulations providing for an Emergency Alert System (EAS) and participation of broadcasters

CFR 47 PART 10 — COMMERCIAL MOBILE ALERT SYSTEM

establishes high level technical architecture for cellular alerting system and the framework for cellular carrier choosing to participate in transmitting emergency alerts

WARN Act —

directed establishment of CMAS, DHS to research technologies for mobile and more effective alerting, requires public broadcast stations to install necessary equipment and technologies to enable the distribution of alerts to commercial mobile service providers

Stafford Act —

directs FEMA to “provide technical assistance to State and local governments to ensure that timely and effective disaster warning is provided”, “make available to Federal State and Local agencies the facilities of the civil defense communications systems”



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What will IPAWS do for a state or local jurisdiction?

- ▶ IPAWS provides local alerting authorities a simple way to alert the public in their area via the Emergency Alert System (EAS), Commercial Mobile Alert System (CMAS), National Weather Radio All Hazards network, and other communications systems.
 - EOC software tool can also share alert and incident information with neighboring state and local systems via EXDL-DE and CAP message exchange
- ▶ FEMA is building the IPAWS capability and infrastructure connections to public communications providers, within FCC rules and regulations

IPAWS connections include:

- ▶ all broadcasters for delivery of alerts in CAP for EAS broadcast alerts
- ▶ participating cellular carriers for broadcast of emergency alert text messages
- ▶ NOAA for All Hazards Radio alert dissemination
- ▶ TBD internet services and future media dissemination paths



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How can local jurisdictions use IPAWS?

- ▶ Be recognized as an authorized state or local public alerting official
 - Apply for access
 - IPAWS will work with you to verify authority via State POC or process
- ▶ Complete IPAWS Training (online soon at FEMA Emergency Management Institute)
- ▶ Be issued IPAWS digital certificate and COG ID
 - Defines access to IPAWS-OPEN for your jurisdiction
- ▶ Use an IPAWS CAP compliant alert origination interface
- ▶ How much will it cost?
 - Tool costs vary based on licenses, features, etc
 - Connection to and use of IPAWS is free to authorized agencies/alert originators
- ▶ When does IPAWS go into production?
 - Aggregation service is online now
 - EAS as broadcasters update encoder/decoder equipment (required by Sep 2011)
 - CMAS will be available as carriers update infrastructure starting in 2012



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CAP and OPEN

CAP = Common Alerting Protocol
OPEN = Open Platform for Emergency Networks



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What is a CAP message?

- ▶ CAP is a structured, organized way to arrange alert information
 - Information is organized using XML tags
 - Human read-able as well as machine read-able
 - Standardized format simplifies message creation and consumption
- ▶ Specific features of CAP
 - Many CAP elements constrain input to standardize terminology
 - Can be digitally signed to assure message integrity (tamper-proof)
 - Message can carry alternate languages, text, and metadata for unique operations
- ▶ Current usage and acceptance
 - Open international standard available to all vendors, users, organizations
 - Adopted by FEMA, DoD, Public Safety Canada
 - Over 100 vendor products are, or will be CAP based



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IPAWS CAP Specifications

▶ Three documents define CAP for IPAWS:

– The OASIS CAP Standard v1.2

- Organization for the Advancement of Structured Information Standards

OASIS web site - <http://www.oasis-open.org>

CAP Standard: <http://docs.oasis-open.org/emergency/cap/v1.2/CAP-v1.2.pdf>

– IPAWS Specification to the CAP Standard (CAP v1.2 IPAWS USA Profile v1.0)

Available on the OASIS web site at:

<http://docs.oasis-open.org/emergency/cap/v1.2/ipaws-profile/v1.0/cap-v1.2-ipaws-profile-v1.0.pdf>

– CAP to EAS Implementation Guide

Developed by the EAS-CAP Industry Group (ECIG)

ECIG web site <http://www.eas-cap.org>

CAP to EAS Implementation Guide link:

http://www.eas-cap.org/ECIG-CAP-to-EAS_Implementation_Guide-V1-0.pdf



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IPAWS-OPEN

- ▶ Open Platform for Emergency Networks (OPEN)
 - Formerly the “interoperability” part of DMIS
 - Currently deployed in FEMA data center as IPAWS-OPEN
 - Provides authenticated “alerting authorities” access to EAS, CMAS, NOAA, internet public alerting systems
 - Uses CAP and EDXL-DE messaging standards
 - Authenticated systems can also exchange messages with each other
 - Gives organizations freedom to choose software that best suits their needs
 - Users need software with connection to IPAWS-OPEN
 - Currently signed testing agreements –
<http://www.fema.gov/emergency/ipaws/aggregator.shtm#3>
click link at: IPAWS-OPEN Developers ([PDF](#) 163KB, [TXT](#) 3KB)



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IPAWS-OPEN

- ▶ IPAWS Open Platform for Emergency Networks (OPEN)
 - *CAP Message broker between authorized alerting authorities and participating communications networks and services such as radio, TV, cellular providers, and internet based services which can alert the public”*
 - Integrates alert collection and dissemination methods of IPAWS
 - collects and routes IPAWS CAP emergency alerts to and from authenticated public safety officials/alerting authorities and emergency alert systems that serve the public
 - Can also broker messages among alerting officials for situational awareness/coordination
 - Free service to authorized public safety/alerting officials and organizations.
 - Web services based design and use of open standards enables interface by many incident management /operations center software tools already in use at state and local levels

List of organizations with MoAs to access IPAWS-OPEN 2.0 Test Environment :



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<http://www.fema.gov/pdf/emergency/IPAWS/cogq.pdf>

CMAS/PLAN Local Availability: When will CMAS be in my area?

- ▶ New York City and Washington DC planned for Dec 2011
 - with supported of Sprint, AT&T, Verizon Wireless, T-Mobile
- ▶ Carrier “roll-out” of capabilities to other areas dependent on participating carriers plans
- for information on specific local areas and cellular carrier plans please contact:
 - Brian Josef
 - CTIA-The Wireless Association®
 - bjosef@ctia.org
 - 202-736-3253

Or your local carrier point of contact



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