

State of 911

Webinar Series

NATIONAL 911 PROGRAM
December 12, 2017

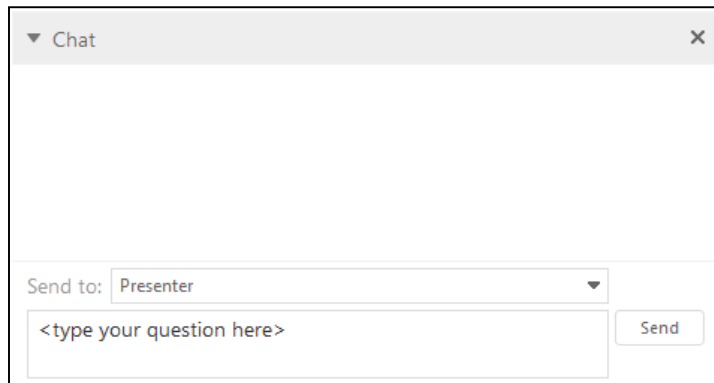
State of 911 Webinar Series

- Designed to provide useful information about Federal and State participation in the planning, design, and implementation of Next Generation 911 (NG911) coupled with real experiences from leaders overseeing these transitions throughout the country
- Webinars are held every other month and typically include presentations from a Federal-level 911 stakeholder and State-level 911 stakeholder, each followed by a 10-minute Q&A period
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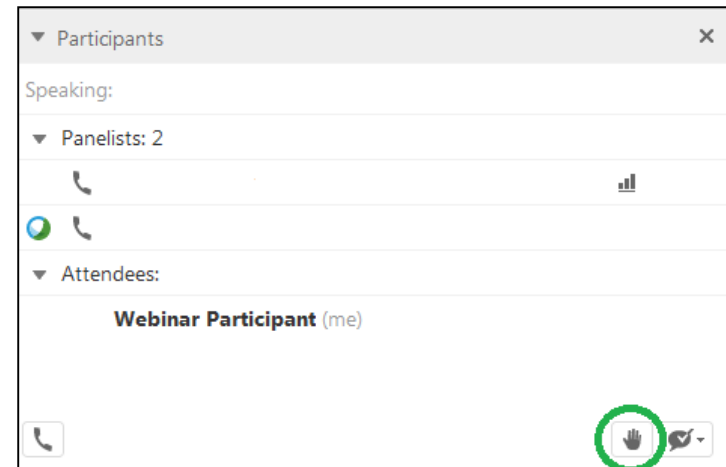
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Federal Communications Commission

Task Force on Optimal PSAP Architecture

Working Group 2:

Optimal Approach to NG9-1-1 Implementation
Final Supplemental Report



NG9-1-1 Readiness Scorecard

Overview of PSAP Task Force

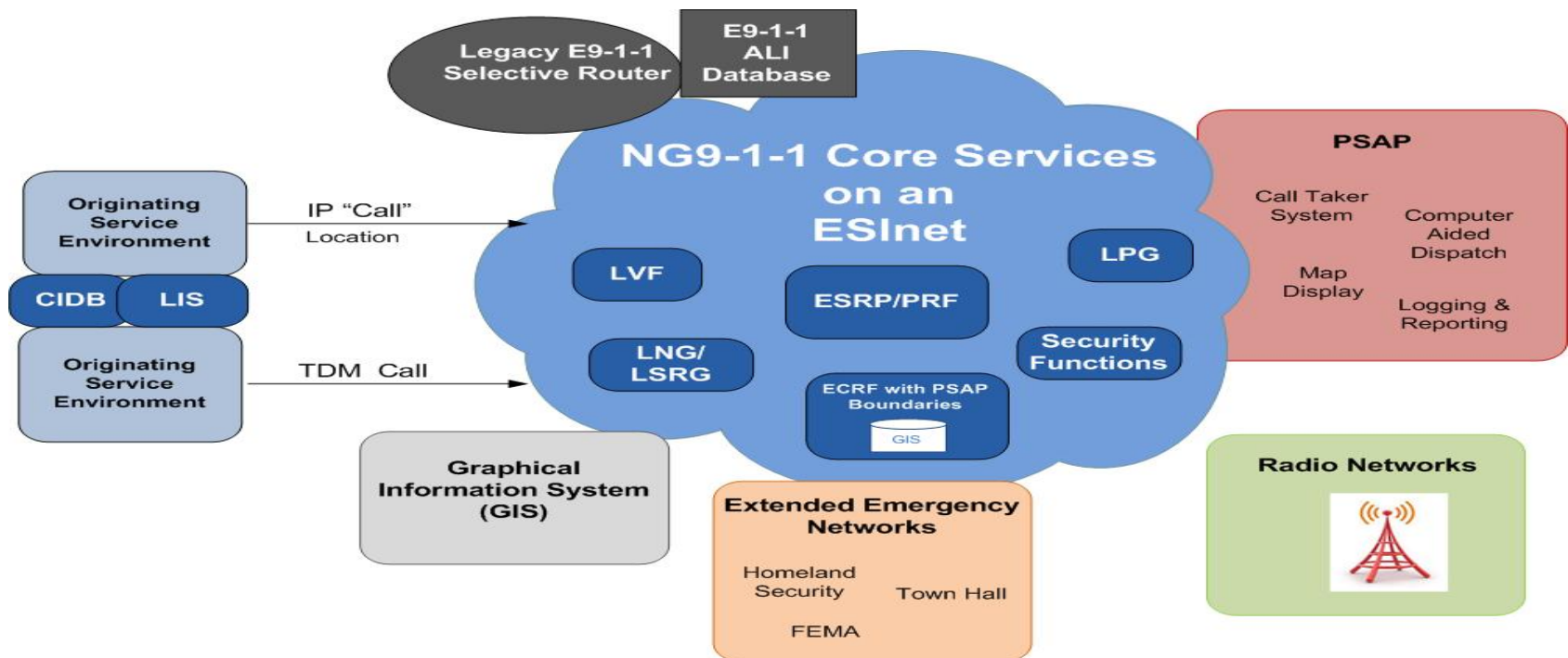
- ∞ Chartered December 2014 – December 2016
- ∞ Three Working Groups
 - Cybersecurity
 - Optimal NG9-1-1 Architecture Implementation
 - Funding/Optimal Resource Allocation
- ∞ Membership
 - PSAPs; Federal, State, Tribal, and local authorities; wireline and wireless carriers; 9-1-1 system service providers; technology vendor community
- ∞ Key Deliverables
 - January 2016: Consolidated Report and Recommendations
 - December 2016: Three Supplemental Reports and Recommendations
 1. Securing PSAPs During NG9-1-1 Transition: (EC3) Concept
 2. NG9-1-1 Funding Sustainment Model
 3. NG9-1-1 Readiness Scorecard
 - Practical guide to ESInet deployment
 - Guidance regarding NG9-1-1 workforce and education challenges

NG9-1-1 Readiness Scorecard

- ∞ In Phase II of TFOPA, Working Group 2 was charged with four tasks:
 - 1) Developing a NG9-1-1 Readiness Scorecard
 - 2) Developing a Framework for NG9-1-1 Planning
 - 3) Workforce Staffing and Training for NG9-1-1
 - 4) ESInet: Lessons Learned from Early Adopters
- ∞ WG2's discussion led to broadening the scope of this activity, recognizing the critical/essential role of the PSAP while simultaneously acknowledging the 9-1-1 Authority and PSAP role in the end-state of a **NG9-1-1 Ecosystem**

NG9-1-1 Components

- The below diagram, as presented in the TFOPA Phase I Final Report, illustrates the role of the PSAP in a fully deployed NG9-1-1 end state.



TFOPA WG2 NG9-1-1 Optimal PSAP Architecture

NG9-1-1... A New Paradigm

- As plans for and implementation of NG9-1-1 systems continue, the 9-1-1 community has an opportunity to embrace the new NG9-1-1 Paradigm to enhance existing, and build new cooperative, collaborative relationships/partnerships.
- The 9-1-1 community will continue to make progress in transitioning the 9-1-1 system from legacy to full “end state” deployment of NG9-1-1 as described in both the TFOPA January 2016 Final Report and the December 2016 WG2 Supplemental Report.
- In WG2’s Phase II discussions, a more evolved conceptual model developed of the ‘transitional steps’ to the implementation of NG9-1-1.

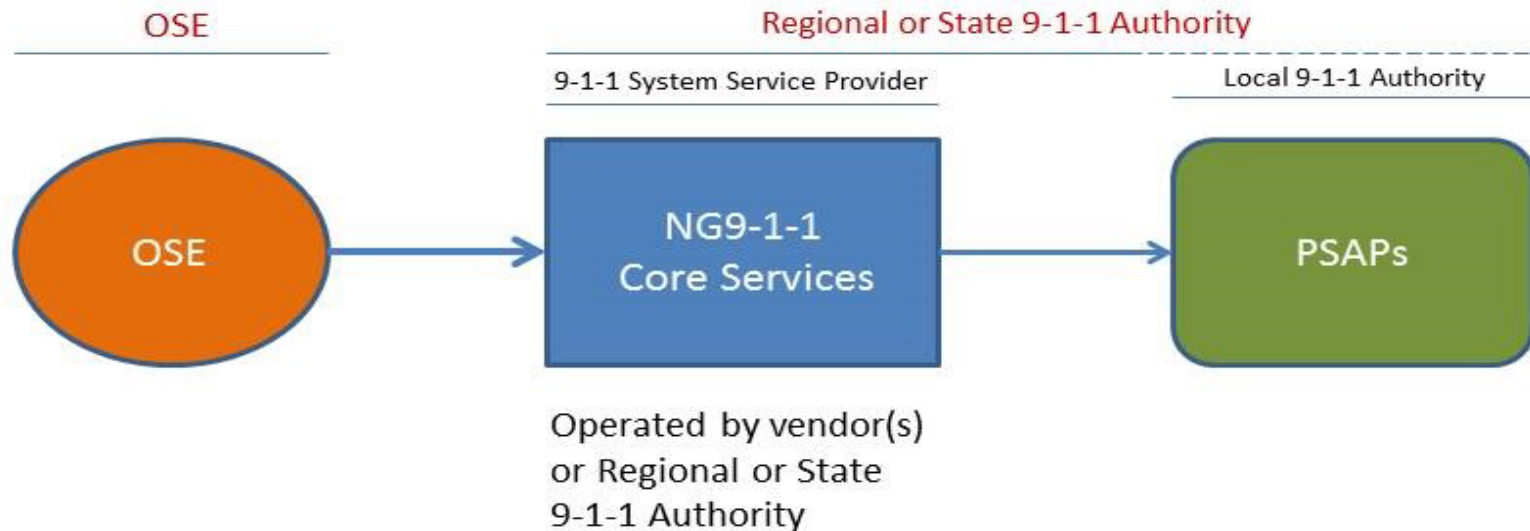
Current State of NG9-1-1 Development

- ⌘ Today, many 9-1-1 Systems and Agencies remain in the Legacy State.
- ⌘ The slow transition has been impacted by many factors, including but not limited to:
 - The absence of agency buy-in resulting from a lack of understanding of the elements associated with a transition to the NG9-1-1 end state
 - Inadequate funding
 - Incomplete or incoherent accredited standards
 - Lack of stakeholder outreach
 - Potential job losses
 - Day-to-day demands which do not afford the time to plan for such a significant change

Required Considerations

- ✎ The below diagram illustrates the NG9-1-1 Roles and Relationships for deployment of NG9-1-1 services.

NG9-1-1 Roles and Relationships



The Path Forward to NG9-1-1

- TFOPA WG2 hopes that PSAP managers, 9-1-1 Authority managers, elected officials at the local, State, Tribal and Federal levels come to an understanding to create NG9-1-1 end states regionally, at the state level and the national level.
- All efforts should be made to compress the timeline of this development and implementation so as to manage it in a planned evolution as opposed to a crisis managed reactionary implementation as TDM (Time-Division Multiplexing) is replaced by IP (Internet Protocol) technology.
- With this in mind, WG2 developed the **NG9-1-1 Readiness Scorecard**.

NG9-1-1 Readiness Scorecard

Purpose:

- ∞ The NG9-1-1 Readiness Scorecard provides 9-1-1 Authority Stakeholders an understanding of the NG9-1-1 implementation **maturity states** and the **essential elements** necessary to be present within each state.
- ∞ It answers the question, “Where are we in the development and implementation stages toward NG9-1-1 deployment?”
- ∞ With this understanding 9-1-1 Authority Stakeholders are able to better plan, budget and execute NG9-1-1 transition.
- ∞ <https://www.fcc.gov/about-fcc/advisory-committees/general/task-force-optimal-public-safety-answering-point#block-menu-block-4>

NG9-1-1 Readiness Scorecard

∞ NG9-1-1 Implementation Continuum

∞ The **Scorecard** utilizes a **multi-step implementation model** which consists of the following maturity states:

- Legacy
- Foundational
- Transitional
- Intermediate
- Jurisdictional End State
- National End State



NG9-1-1 Readiness Scorecard

NG9-1-1 Essential Elements

∞ The **Scorecard** then identifies essential elements which are necessary to be present within each **NG9-1-1 Implementation Maturity State**.

∞ **Essential Elements** are categorized into the following areas of interest:

- Governance
- Routing & Location
- GIS Data
- NG Core Service Elements
- Network
- PSAP Call Handling System and Applications
- Security
- Operations
- Optional Interfaces

NG9-1-1 Readiness Scorecard

Next Generation 9-1-1 Readiness Scorecard						
Requirement	NG9-1-1 Implementation Maturity State					
	Legacy	Foundational	Transitional	Intermediate	i3 End State - Jurisdictional	i3 End State - National
<u>Governance</u>						-
<u>Routing & Location</u>	-	-	-	-	-	-
<u>GIS Data</u>						-
<u>NG Core Service Elements</u>	-	-	-	-	-	-
<u>Network</u>						-
<u>PSAP Call Handling System & Applications</u>	-	-	-	-	-	-
<u>Security</u>						-
<u>Operations</u>						
<u>Optional Interfaces</u>						

NG9-1-1 Readiness Scorecard

Next Generation 9-1-1 Readiness Scorecard							
Requirement	NG9-1-1 Implementation Maturity State						
	Legacy	Foundational	Transitional	Intermediate	i3 End State - Jurisdictional	i3 End State - National	
	<u>Governance</u>						
Governance Structure Design & Framework	Optional	X	X	X	X	-	X
Strategic Planning	Optional	Optional	X	X	X		X
Coordination	Optional	Optional	X	X	X		X
Funding & Resources	Optional	X	X	X	X		X
<u>Routing & Location</u>	-	-	-	-	-	-	-
<u>GIS Data</u>							-
<u>NG Core Service Elements</u>	-	-	-	-	-	-	-
<u>Network</u>							-
<u>PSAP Call Handling System & Applications</u>	-	-	-	-	-	-	-
<u>Security</u>							-
<u>Operations</u>							
<u>Optional Interfaces</u>							

NG9-1-1 Readiness Scorecard

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	Legacy	Foundational	Transitional	Intermediate	i3 End State - Jurisdictional	i3 End State - National
<u>Governance</u>						-
<u>Routing & Location</u>						
Selective (ESN) Routing	X	X				
IP Selective (ESN) Routing			X			
Geospatial Routing (utilizing best available location)				X	X	X
ALI DBMS	X	X	X	X		
LIS				Optional	X	X
National Forest Guide contains Jurisdictional ESInet Authoritative Boundary					Optional	X
If applicable, Hierarchical Forest Guides Populated					Optional	X
<u>GIS Data</u>						
<u>NG Core Service Elements</u>						
<u>Network</u>						
<u>PSAP Call Handling System & Applications</u>						
<u>Security</u>						
<u>Operations</u>						
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NG9-1-1 Readiness Scorecard

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<u>Governance</u>						
<u>Routing & Location</u>	-	-	-	-	-	-
<u>GIS Data</u>						
NG911 Dataset Creation Project Planned		X				-
NG911 Dataset Creation Project in-Progress		X	X Optional			-
NG911 Dataset Complete				X	X	X
Data formatted for Location Verification Function (LVF)			Optional	Optional	X	X
Data formatted for Emergency Call Routing Function (ECRF)			Optional	X	X	X
Data formatted for Policy Routing Function (PRF)			Optional	X	X	X
Jurisdictional Boundaries exported to neighboring ESInets					Optional	X
<u>NG Core Service Elements</u>						
<u>Network</u>	-	-	-	-	-	-
<u>PSAP Call Handling System & Applications</u>	-	-	-	-	-	-
<u>Security</u>						-
<u>Operations</u>						
<u>Optional Interfaces</u>						

NG9-1-1 Readiness Scorecard

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	Legacy	Foundational	Transitional	Intermediate	i3 End State - Jurisdictional	i3 End State - National
<u>Governance</u>						-
<u>Routing & Location</u>	-	-	-	-	-	-
<u>GIS Data</u>						-
<u>NG Core Service Elements</u>	-	-	-	-	-	-
Legacy Selective Router Gateway (LSRG)			Optional	X	Optional	Optional
Location Verification Function (LVF)			Optional	Optional	X	X
Emergency Services Routing Proxy (ESRP)			Optional	X	X	X
Emergency Call Routing Function (ECRF)			Optional	X	X	X
Legacy Network Gateway (LNG)			Optional	X	Optional	Optional
Legacy PSAP Gateway (LPG)			Optional	X	Optional	Optional
Border Control Function (BCF)			Optional	X	X	X
Logging				X	X	X
<u>Network</u>						-
<u>PSAP Call Handling System & Applications</u>	-	-	-	-	-	-
<u>Security</u>						-
<u>Operations</u>						-
<u>Optional Interfaces</u>						-

Important Considerations: Framework For NG9-1-1 Planning

- ✎ Development of a formalized 9-1-1 Planning Authority;
- ✎ 9-1-1 Coordinator Designation;
- ✎ Regional Planning;
- ✎ Formalized Participation Agreements, if not legislatively mandated;
- ✎ Formalized Memorandum of Understanding (MOU) Among Stakeholders;
- ✎ Intra and Inter-State Planning Considerations;
- ✎ PSAP Operational Impact Planning;
- ✎ Information Sharing and Collaboration;
- ✎ Outreach Programs;
- ✎ Funding & Funds Management

NG9-1-1 Planning & Implementation: Maturity State

		NG9-1-1 Implementation Maturity State					
		<u>Precedent</u>	<u>Legacy</u>	<u>Foundational</u>	<u>Transitional</u>	<u>Intermediate</u>	<u>i3 End State</u>
<u>Item</u>	<u>Governance</u>						
1	Governance Structure (State)						
1a	Develop a Name, Authority, and Purpose for a formalized state 9-1-1 governance body that solidifies the legal standing of the governing body and the purpose of its establishment. Indicate where the authority derives from (i.e. state or federal statutes) and if it amends or supersedes any prior authority.		Optional	Required	Required	Required	Required
1b	Define in detail what the state governance body has the authority to oversee, including any rule-making authority, aligning activities to overarching strategies and plans (i.e., State 9-1-1 plan, SCIP, NECP) and maintaining fiduciary and fiscal compliance.		Optional	Required	Required	Required	Required

Important Considerations

- ✎ Originating Service Provider (OSP) Access to NG9-1-1 System
- ✎ NG9-1-1
 - Understand the defined term ESInet (what it is and its role)
 - Size the ESInet relative to its purpose over time
 - Design the ESInet with appropriate resilience, quality and SLAs upfront
 - Ensure proper network management and security at each stage of its evolution
 - Anticipate cross entity collaboration
- ✎ Security
- ✎ Assess & Prioritize
 - Risks Management

Conclusion

- ✎ WG2's goal in the Supplement to the TFOPA Final Report has been to more specifically identify the elements required to transition to full NG9-1-1.
- ✎ The Supplemental Report is intended to assist PSAPs, 9-1-1 Authorities, government interests, policy development groups and all parties by providing a straightforward checklist which can then be used for planning and implementation as 9-1-1
- ✎ Through the checklist, authorities move through the implementation maturity states within the NG9-1-1 Implementation Continuum toward a full deployment end-state.

Conclusion – cont...

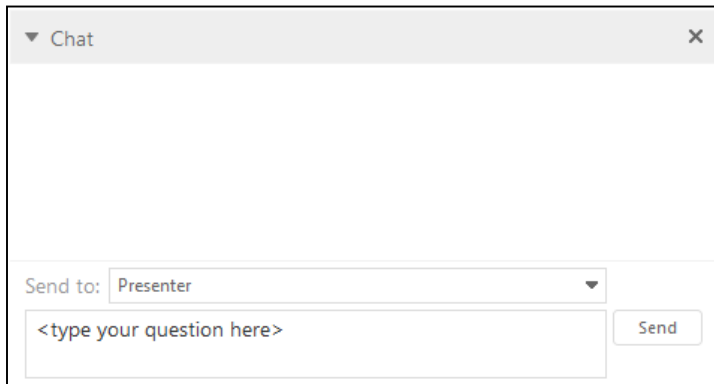
- ⌘ Although the Supplemental Report can be read and used as a stand-alone report, we encourage readers to also review the TFOPA Final Report approved January 29, 2016.
- ⌘ These two documents together will serve elected officials, 9-1-1 Managers, and 9-1-1 Authorities to better understand the challenges they have ahead of them through the evolution of steps to NG9-1-1 End State.
- ⌘ The need to move to multi-media NG9-1-1 is essential.
 - Citizens desire it, the deaf and hard of hearing community require it, and the 40+ year old TDM switched environment has reached end of life!
- ⌘ We can move forward now in a planned transition or we can wait, deny, or resist and ultimately reach a point of crisis in 9-1-1.

Questions or Comments

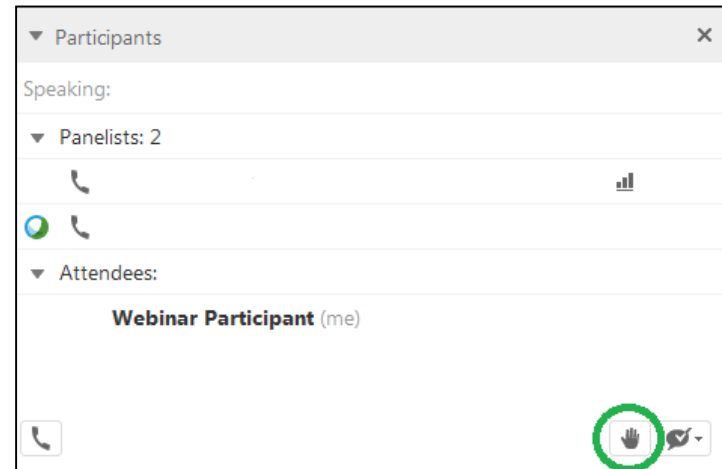


Q&A Period

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Tennessee NG9-1-1 Clearinghouse Pilot Project

State of 911 Webinar

Smartphones have transformed the way we live

...but not when it comes to 9-1-1!



Estimated

Sometimes

- ~~Precise location (Cell tower, GPS, WiFi Access Points, etc.)~~
- ~~Real-time health / medical information~~
- ~~Connection over any medium: PSTN, LTE/4G Data, WiFi~~
- ~~Camera feed~~
- Texting *in 15% of PSAPs (with even worse location than calls)*
- Voice
- ~~Video conferencing~~
- ~~Route planning / directions~~
- ~~Emergency contacts~~

Let's start with location – what is the problem?

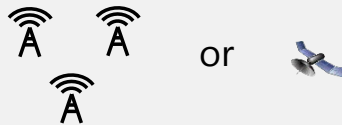
Phase 1

- Civic address of cell tower



Phase 2

- Latitude, Longitude, Uncertainty, Confidence
- "Either/or" solution
 - Mostly cell tower triangulation
 - Some carriers: aGPS, only outdoors



National Emergency Address Database

- Civic address with indoor location information of closest WiFi Access point
- Building owner / manager expected to voluntarily enter indoor information manually into a database
- Who will enter, validate, maintain, update the data? Who will pay for it?

“But Why Can Uber Find Me and 9-1-1 Can’t?”

Device-based hybrid location: Combine ALL sensors!



It could/should be:

- 1. More accurate**
- 2. Faster**
- 3. Update automatically**

Cell Tower Triangulation:

Reliable, but not very accurate

GPS:

Highly accurate and reliable outdoors

WiFi Access Points:

Highly accurate indoors, and it's getting better and better

Bluetooth Beacons:

Potentially highly accurate indoors (Let's see)

Barometric Pressure:

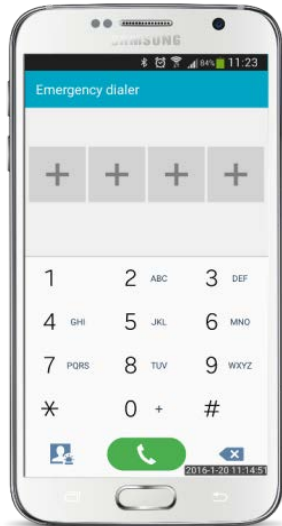
Altitude reading (z-axis)

Pedestrian Dead Reckoning:

Accelerometers, step counters, ..

Getting hybrid location from smartphones into 9-1-1

Android ELS (Emergency Location Service)



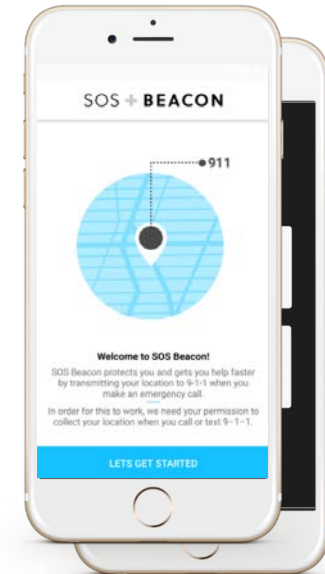
- Google has already installed it on 99% of Android devices in the US (100M+)
- Successfully deployed in other countries (UK, Estonia, New Zealand, etc.)
- Native 9-1-1 call (app not required to initiate call)

Beacon Service (Beacon API & SDK)



- RapidSOS Offering to Device Manufacturers and large App providers
- Transmits not just location, also has access to additional data
- Native 9-1-1 call (app not required to initiate call)

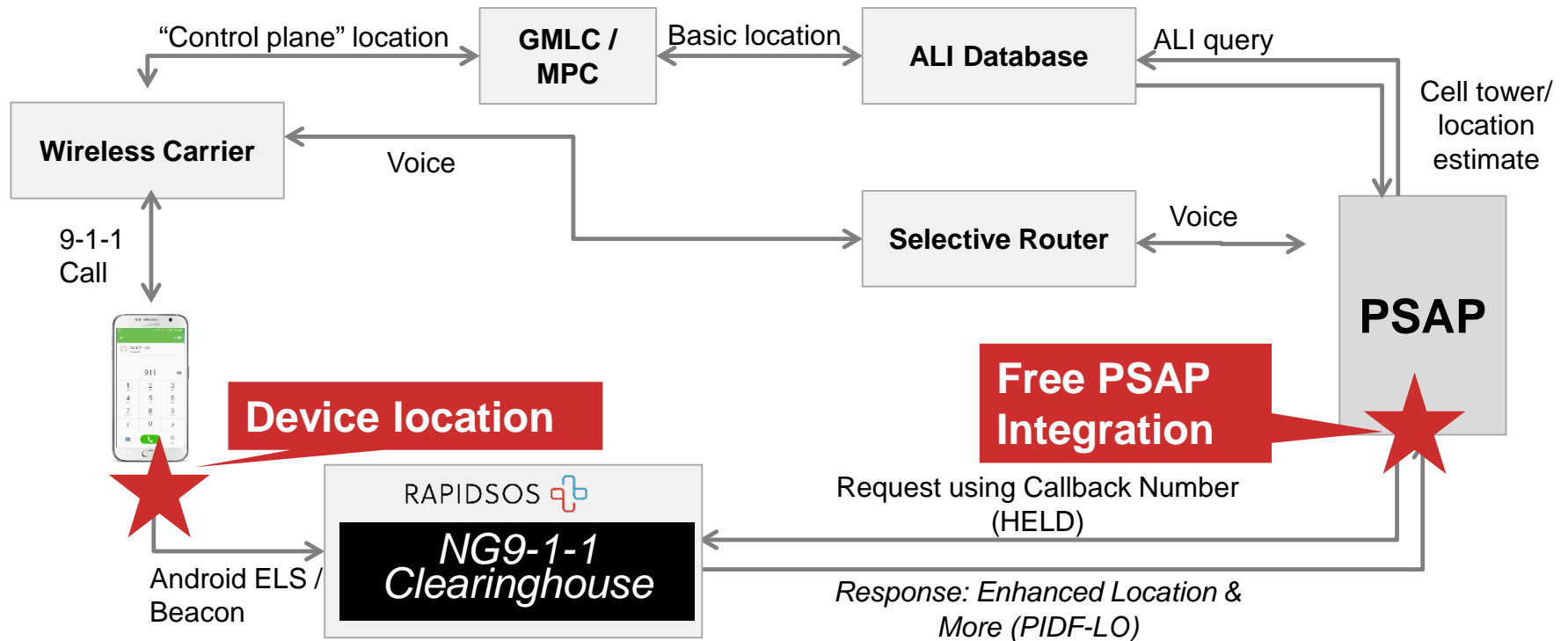
Smartphone Apps (Haven App & others)



- Apps, either direct to consumer or through distribution partners (Insurance, Universities, Non-Profits, Municipalities)
- Tackles additional issues (call routing, texting, multimedia, additional data, intelligent connection management,..)

NG9-1-1 Clearinghouse Architecture

Rapid Rebid gives you supplemental data in addition to ALI – not a replacement!



TECB Partnership with RapidSOS

Working together to get device-based hybrid location to 9-1-1 via the NG9-1-1 Clearinghouse.

Governance

Core project team met every other week to monitor progress and provide project oversight:

- **Curtis Sutton (Executive Director, TN Emergency Communications Board)**
- **Jennifer Estes (Chairwoman, TN Communications Board)**
- **Eddie Burtchell (Chief of Technology, TN Emergency Communications Board)**
- **Reinhard Ekl (VP of Product & Public Safety, RapidSOS)**

Execution

Integrations were performed and deployed by CPE/CAD vendor partners, test devices enabled by RapidSOS.

There was no direct project cost for TN Emergency Communications Board or participating PSAPs/9-1-1 Districts.

Common Project Objectives Were Defined



Improve location accuracy and speed of location delivery for Wireless 9-1-1 calls



Demonstrate that the improved location can be sent to PSAPs without using an app

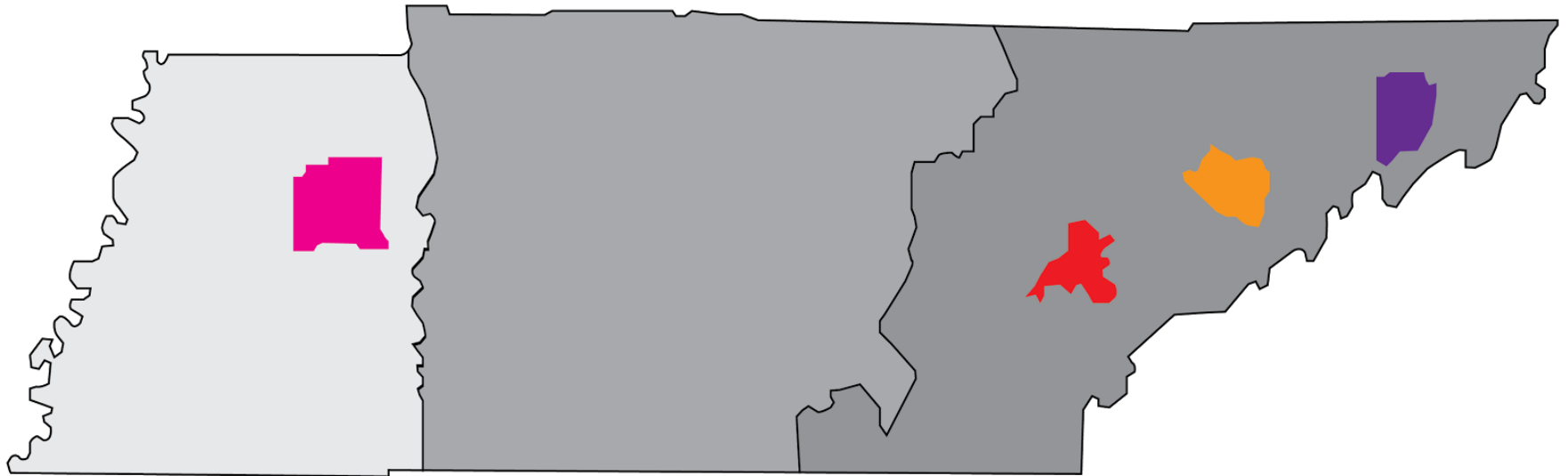


Generate a reference case study & NG9-1-1 success story ahead of more deployments across Tennessee



Showcase the value of close collaboration amongst key stakeholders

PSAPs in Different Morphologies Selected for Stage 1



 Carroll County

 Loudon County

 Jefferson County

 Washington County

Stage 1 Findings Are Very Encouraging

Accuracy

Location from device-based hybrid technology is more accurate and reliable than currently used technology, especially indoors.

Speed

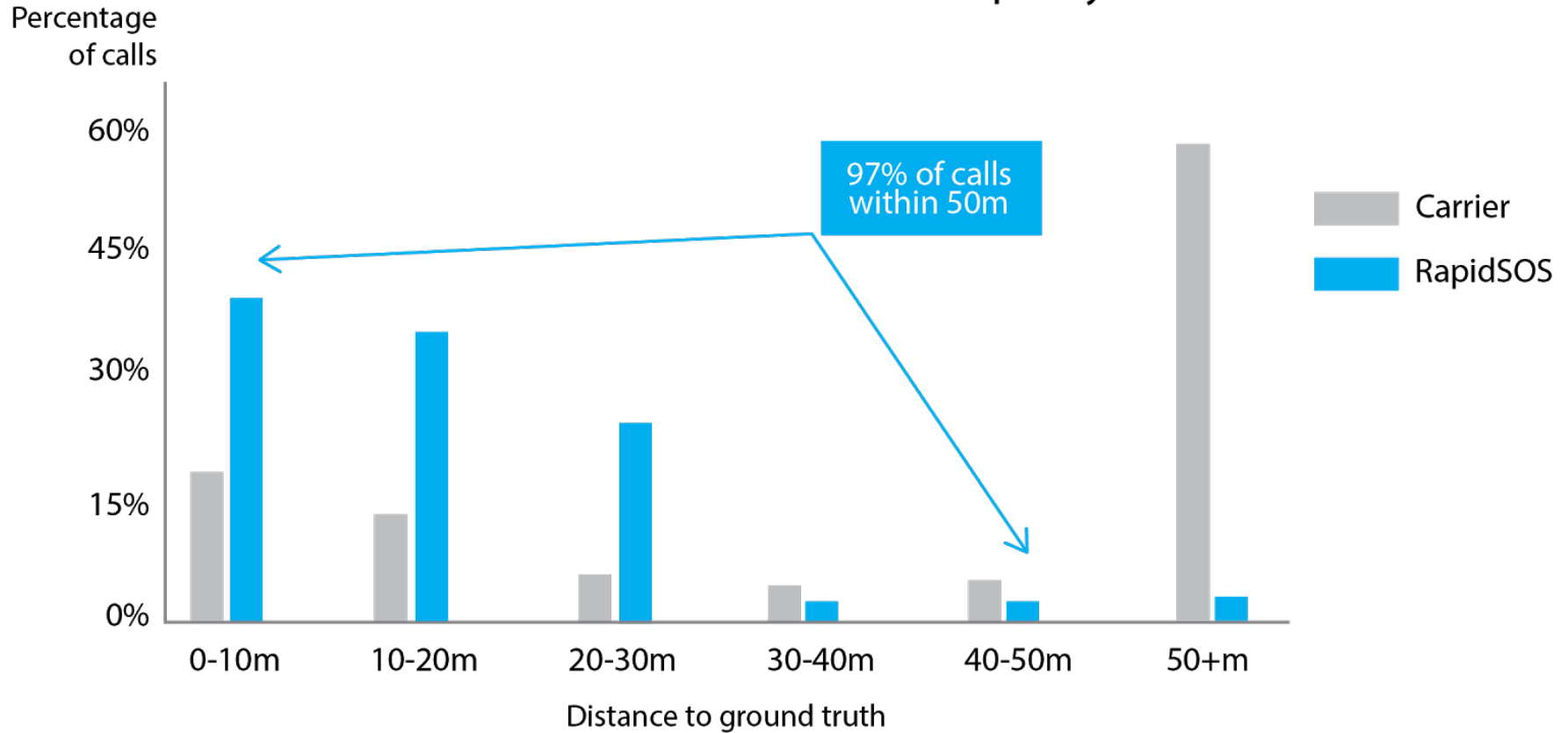
The RapidSOS NG9-1-1 Clearinghouse mechanisms transmit location faster and update more frequently than current ALI mechanisms.

Usability

Integration into existing PSAP equipment is critical from a usability perspective.

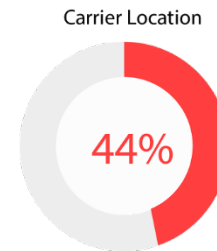
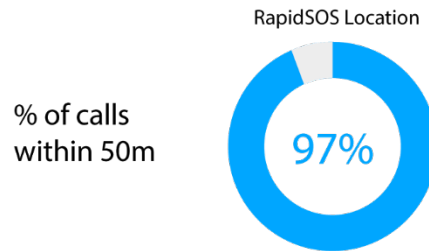
Results Show Difference Between Carriers & RapidSOS

Distribution of Location Discrepancy



Detailed Test Results Available in Report

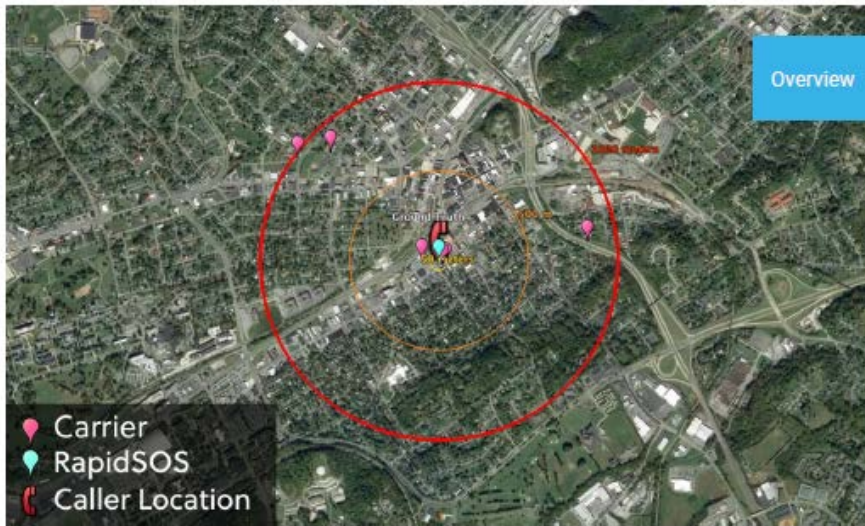
Carrier	Device	Day of call	Time of call	Location description	Distance Ground Truth to WPH1 (meters)	Distance Ground Truth to Latest WPH2 (meters)	Distance Ground Truth to RSOS (meters)
AT&T	LG Nexus	3/14/2017	9:11	At console	3722	7	10
AT&T	LG Nexus	3/14/2017	9:15	At console	1072	N/A	10
Verizon	LG Nexus	3/14/2017	9:18	At console	3720	24	10
TMO	Samsung	3/14/2017	9:25	At console	12984	1202	10
Sprint	Samsung	3/14/2017	9:29	At console	1073	41	10
AT&T	iPhone	3/14/2017	9:34	At console	3720	1983	5
Verizon	MOTOX Pure	3/14/2017	9:45	At console	3720	N/A	10
TMO	Samsung	3/13/2017	16:08	At console		836	8
AT&T	LG Nexus	3/13/2017	16:12	At console	1449	861	2
Sprint	Samsung	3/13/2017	16:16	At console		40	2
AT&T	iPhone	3/13/2017	16:18	At console	1448	981	7
AT&T	LG Nexus	3/13/2017	17:27	Outside right next to PSAP back door	1678	5	8
AT&T	iPhone	3/13/2017	17:30	Outside right next to PSAP back door	1439	13	3
Sprint	Samsung	3/13/2017	17:37	At console		31	3
TMO	Samsung	3/13/2017	17:51	At console		98	11



Pilot Deployments are up and running across the country with different vendors.

Sample Results: Washington County, TN

Test Calls on 3/13/2017, 4:08 - 5:51 pm, 8 calls from 4 different devices



Sample Results: Loudon County, TN

Test Calls on 3/14/2017, 9:11 - 9:45 am, 7 calls from 6 different devices



Example Clearinghouse Integration: Zetron MAX CT

The screenshot displays the Zetron MAX Call-Taking software interface. The main window is titled "MAX Call-Taking" and "ZETRON".

Call Information:

- 911 911-kw WPH2
- Duration: 00:00:49
- RapidSOS Test Phone (718) 974-4590
- 12034 134TH CT NE REDMOND, WA

Map: A map of the Totem Lake area in Redmond, WA, showing streets like NE 132nd St, NE 130th St, and NE 128th St. A location marker is visible near NE 124th St.

Call Details:

- ALI: 22 1602, 47,709
- RapidSOS: 47.7088914, -122.1602972

Agent List:

- Denver EMS L_112
- Denver FD L_111
- Denver PD L_110
- Kurt-test-postdial-ext...
- Hello Nurse
- Kurt-test-postdial-to-30...
- Fire-Blind
- ctrl-0
- Medical-Conf
- Vijay
- 911 Xfer (*21)
- Kurt-ext2
- Conference Room 8000
- NewDial - External

Call Controls:

- Blind Transfer
- Transfer
- Consultative Transfer
- External Transfer
- Release

System Status:

- Not Ready
- Call Taker
- 2:39:07 PM
- Tuesday, February 7, 2017

Dozens of Agencies Have Expressed Interest in Stage 2

- Bedford County
- Benton County
- Bledsoe County
- Bradley County
- Brentwood
- Cheatham County
- Claiborne County
- DeKalb County
- Franklin County
- Giles County
- Hamilton County
- Hardin County
- Henderson County
- Johnson County
- Kingsport ECD
- Knox County
- Lawrence County
- Macon County
- Marion County 911
- Martin PD
- Nashville/Davidson County
- Perry County
- Polk County
- Putnam County
- Rutherford County
- Scott Co ECD
- Sequatchie County
- Shelby County
- Tipton County
- Weakley County
- Williamson County

Learn more and download the full report at:

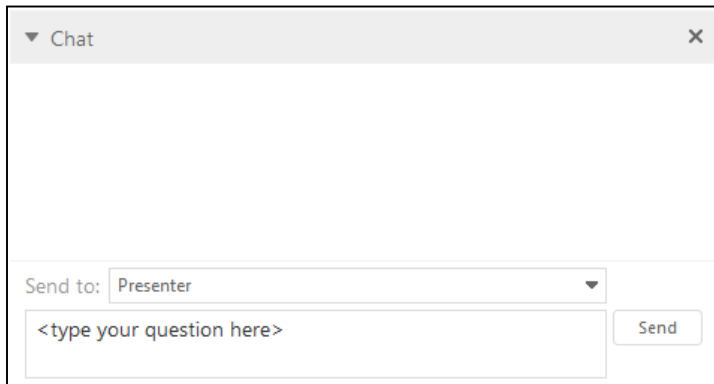
<https://info.rapidsos.com/blog/tennessee-pilot-project>



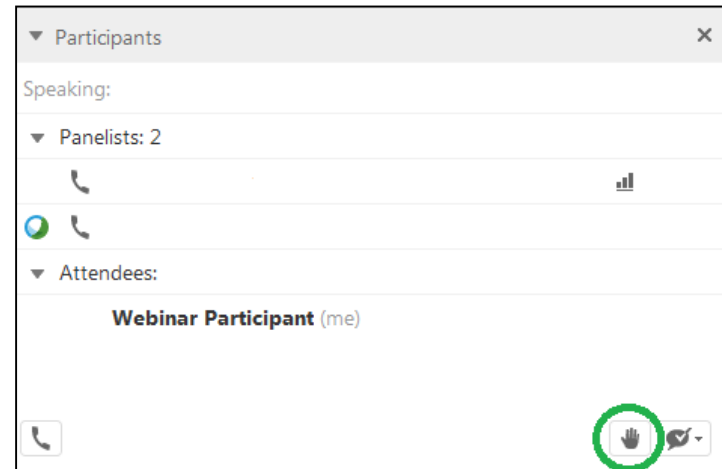
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Future Webinars

- Tuesday, February 13, 2018 at 12 noon ET
- To register, visit: <https://tinyurl.com/2018Stateof911Webinars>
- Previous State of 911 webinars are available at: www.911.gov/webinars.html

National 911 Program

- Laurie Flaherty
Program Coordinator
202-366-2705
laurie.flaherty@dot.gov
- Feedback or questions can be sent to:
National911Team@mcp911.com