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Leaders in Public Safety Communications™

# PUBLIC SAFETY **Communications**

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## The Consolidated PSAP: Overcoming Technical Challenges

*Morristown-Hamblen E-911 Center  
Hamblen County, Tennessee*

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consoles you can count on

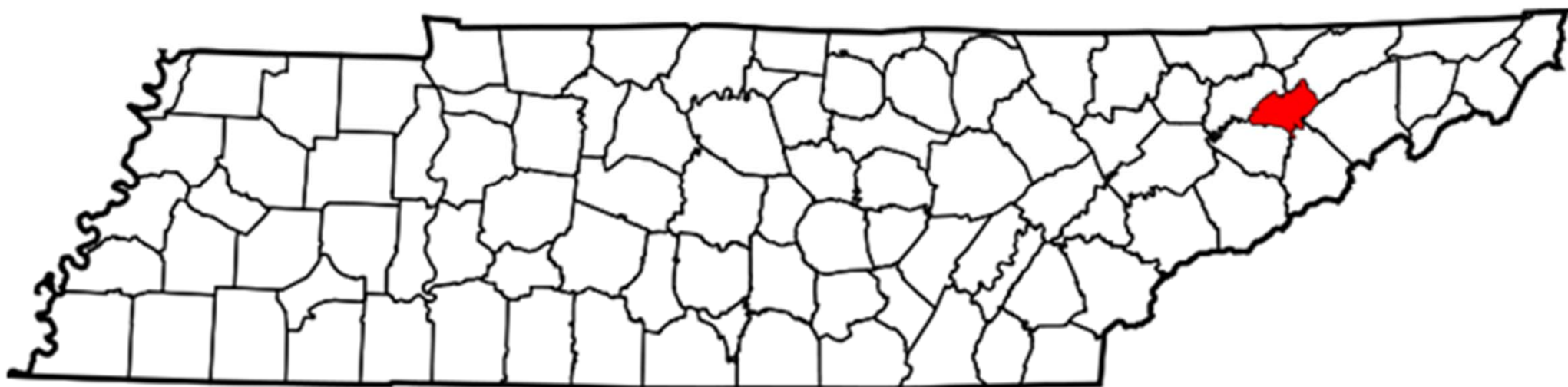


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# Purpose of Webinar

- ▶ To exchange technical information for operating modern day evolving PSAPs.
  - ▶ Contrast early methods verses modern day capabilities.
  - ▶ To exchange ideas and methods.
- 

# Hamblen County Tennessee




Hamblen County's population = 62,544 (2010 Census)

Hamblen County is the third smallest of 95 counties (161 sq miles),  
yet, is the 21<sup>st</sup> most populated county.

City of Morristown (county seat) / Russellville / Whitesburg / Talbott

# The County We Serve

- ▶ The Morristown Metropolitan Statistical Area
  - ▶ Several state highways, ten (10) miles of Interstate 81, and the Norfolk–Southern main line runs through the county.
  - ▶ The terrain is characterized with many hills and valleys which present a challenge to communication – RF and Data.
  - ▶ The highest point in the county is Crockett Ridge with an elevation of 1,952ft.
- 



## Where it all happens... >>

A view of Console 4 - one of five consoles in the main E-911 Center.  
All consoles are exact replicas.

# Hamblen Co. 911 opened for business on 29 January 1990

## But before 911...

- ▶ Police Department had two GE consoles.
- ▶ Fire Department had a GE desktop controller.
- ▶ EMS had a single desktop control station.
- ▶ Sheriff's Office had a GE desktop controller.
- ▶ Rescue Squad had a GE desktop controller.
- ▶ Volunteer Fire Departments (4) dispatched by Sheriff's Office.

# In The Beginning...

- ▶ GE Consoles moved from police department to the new center.
- ▶ A new 1A2 Key Telephone System installed.
- ▶ The center had one NCIC computer terminal.
- ▶ Total of 8 dispatchers and director to cover all shifts – responsible for call taking and dispatch to participating agencies
- ▶ A two deck Magnasync reel to reel recorder.
- ▶ Used clock punched time cards for call tracking.
- ▶ Local alarm panels for fire and burglar alarms were wired directly to the center.




# Participating Agencies

- ▶ Hamblen Co. 911 is the only PSAP in the county and also dispatches for:
  - ◊ Morristown Police Department
  - ◊ Morristown Fire Department
  - ◊ Morristown Emergency Rescue Squad
  - ◊ Morristown–Hamblen EMS
  - ◊ Morristown–Hamblen Humane Society
  - ◊ Hamblen County Sheriff's Department
  - ◊ Hamblen County Volunteer Fire Departments (4)
  - ◊ Emergency Management Agency
  - ◊ Walters State Campus Police Department


# As we grew and expanded...

- ▶ Dispatch console research revealed Orbacom to be our choice; due to the speed afforded by the touch screen capability (two positions originally)
- ▶ In the mid 1990's two more consoles were purchased to handle increase call volume and for additional backup capability.
- ▶ After 9/11, funding allowed for additional equipment at a new EOC located approx. five miles west.
- ▶ Phone system upgraded to a multi-position Positron system.

# The Upgrade to an Orbacom Console

- ▶ Needed versatility and expansion capability.
  - ▶ Wanted a technology with at least a ten year life.
  - ▶ Needed a robust system with hot standby.
  - ▶ Needed remote capabilities.
  - ▶ Market research found Orbacom to meet all specifications and requirements.
  - ▶ Orbacom system was purchased in 1992.
- 


# The First Phone System Upgrade

- ▶ Needed a phone system with more features.
  - ▶ Needed expansion capability.
  - ▶ Market research leads to Positron contract.
  - ▶ Needed more flexibility to enhanced dispatch capability as call volume increased.
  - ▶ Supplied the first ANI capability for the dispatcher.
- 

# The Zetron Phone System Upgrade

- ▶ Made E-911 Phase 2 compliant with all the information being displayed on the phone screen CRT monitor.
- ▶ The Zetron system was interfaced with the CAD system (*purchased in 1994*) in 1997.
- ▶ Dispatchers could now verify the information provided and transfer it to the CAD call screen - saving keystrokes and enhancing our call capability

# MDTs / Mapping / Backhaul

- ▶ Morristown Police Department moved to implement digital mobile dispatching.
  - ▶ Mapping acquired in 2002 in preparation for deployment of MDTs.
  - ▶ Mapping integrated with the phone to synchronize MSAG / ALI / GIS data.
  - ▶ Mapping improved response time and call address accuracy.
  - ▶ The MDTs spurred implementation of the first digital backhaul system.
- 

The screenshot displays a mapping application interface. At the top, there is a toolbar with various tools like 'Scale', 'Addresses', 'Streets', 'Points of Interest', 'MilePosts', 'Lat/Long', 'Routing', 'Incidents', 'Ortho', 'InfoTips', 'Create Incident', and 'Show Restrictions'. The main area is split into two panels: 'Incident Map' on the left, which is an aerial view of a residential neighborhood with yellow house numbers (e.g., 1820, 1825, 1826, 1830, 1833, 2215, 2303, 2307, 2311, 2315) and a red 'HERITAGE' road; and 'AVL Map' on the right, which is a regional map showing counties like Grainger, Hawkins, Jefferson, and Cocke, along with major highways (I-75, I-40, I-25, I-175) and a central cluster of yellow dots representing AVL locations. Below the maps is an 'Incidents' table with columns for Date/Time, Area Co., Phone#, House#, UnitNumber, Prefix, Name, Type, Suffix, Community, Latitude, Longitude, and Other.

Date/Time	Area Co...	Phone#	House#	UnitNumber	Prefix	Name	Type	Suffix	Community	Latitude	Longitude	Other
1/5/2013 3:43:46 PM										36.219059	-83.261795	
# 01/05/2013 15:19:03#			525		N	HAUN	DR			36.219082	-83.261925	
1/5/2013 3:18:36 PM												
# 01/05/2013 15:17:56#						MH HOSP / HERITAGE						

## A view of our mapping screen... >>

MDTs are populated on the map in real time using AVLs. This moved the Morristown Police Department from 'zone dispatching' to 'location dispatching' and reduced response times.

# Choosing a Digital Radio Backhaul System

- ▶ Started with Infinet 4.9 GHz 36 Mbps system with marginal performance.
- ▶ Tranzeo 2.4 GHz 11 MBps deployed as backup which – again – proved to be marginal
- ▶ Researched market for an affordable high performance backhaul system – chose Ubiquiti Networks 2.4, 5.8, and 24 GHz 300 Mbps and 1.4 Gbps units.
- ▶ System meeting expectations and service.



**Any questions so far...**



# Scout™

**PROVEN TRUSTED RELIABLE**


The most innovative IP dispatch console system that easily adapts to new technologies and supports more direct wireline radio interfaces than any other console solution.



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# Phone Upgrade to Vesta Pallas by Plant CML

- ▶ Vesta Pallas was implemented due to new digital enhancements.
  - ▶ Analog-to-digital provided dispatchers minimum enhancements, but was the trend toward NG911.
  - ▶ It was a stepping stone to enhanced instant recall that could be relayed to the field personnel.
- 

# Phone System Upgrade to Patriot Sentinel with AT&T

- ▶ Met current NG911 standards.
- ▶ System allows for geo-diversity and backup AND provided an automatic fail-safe, which the Vesta Pallas did not.
- ▶ Dispatchers have more features readily accessible than previous systems offered.
- ▶ Enhanced MIS (Management Information System) for administrative efficiency.
- ▶ This is the first implementation of VoIP dispatch phone communication.
  - Discussion of VoIP networking challenges.
  - Computer remoting challenges.

ANI Trunk Status Circuit 9-1-1 Admin  
Position Calls Ringing 0 0  
ACD Calls Pending 0 0  
OPN ESN Call State Calls on Hold / Parked 0 0

Request ALL Refresh ALL Release Answer 9-1-1 Release Call History

(865) 803-0171 14:14 01/05  
2550 E MORRIS BLVD -

N  
MORRISTOWN TN 100 WRLS  
VERIZON WIRELESS  
P# 803-0171

ALT# 423-736-2974 LEC:VZW

-083.261797 +36.219081

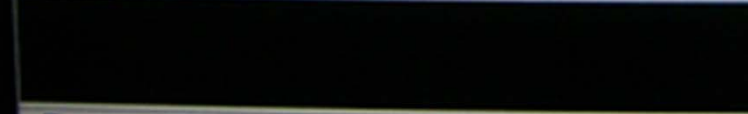
100 of 100 1/5/2013 2:14:10 PM Clear

Case no. N/A

Conference window



Hold window



Abandoned

2201	2202	2203	2204
2205	2206	2207	

5852701	5852702	5852713	5852714	5852715
5852716	5862121	5862122	BullGap	

911-1	911-2	911-3	911-4
911-5	911-6	911-7	911-8

MAIN TRANSFER TOW WARRANTS EMS HOSPITALS MPD HCSD MISC

Answer	DND	Prev Calls	Non Ex Hold	Flash	Keypad	Speed Dial	Ringback	Volume	TTY	Release

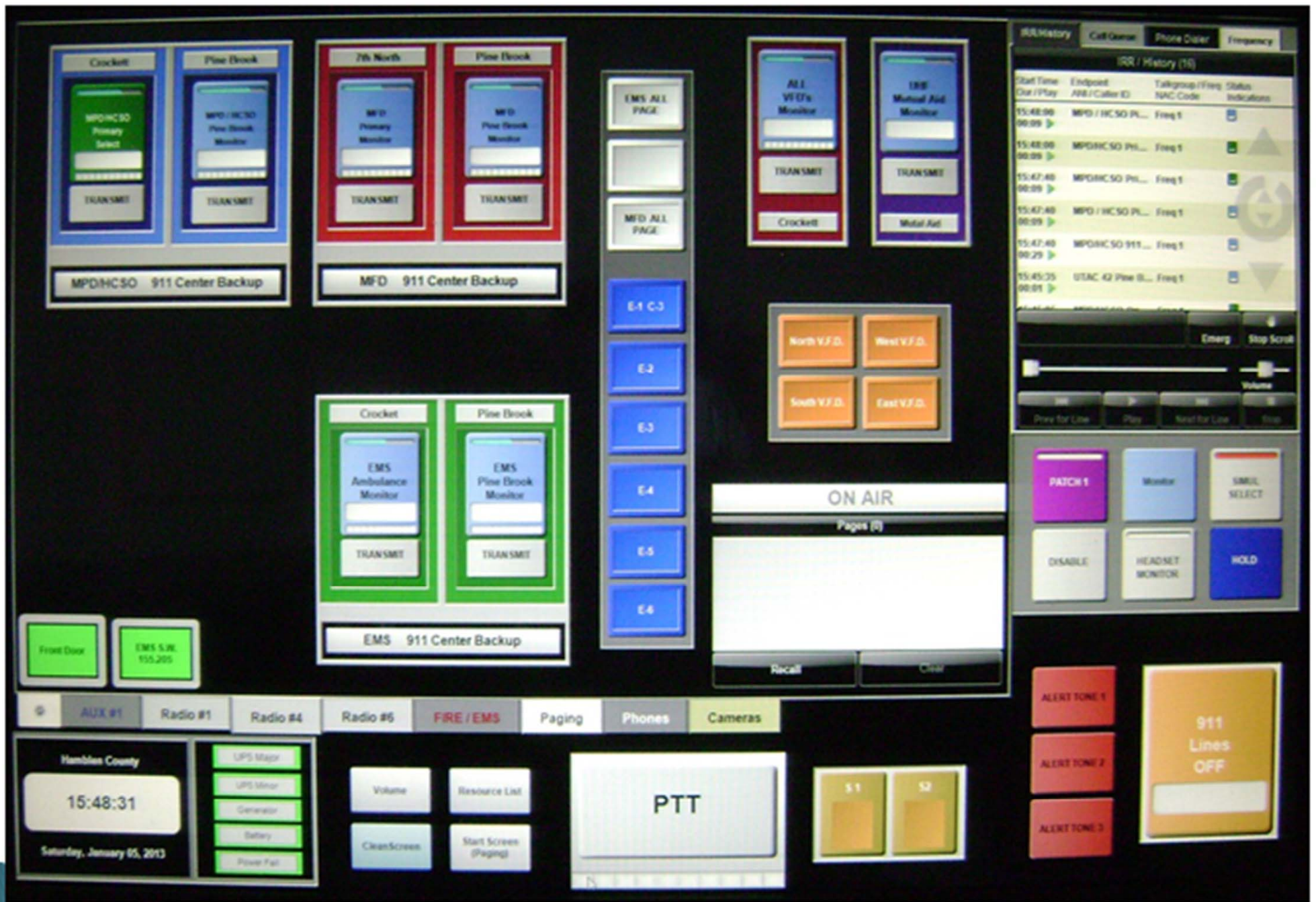
Edit View Tools Actions Help  
 Trunk Status Circuit  
 Position Calls Ringing 0 0  
 ACD Calls Pending 0 0  
 Calls on Hold / Parked 0 0  
 ESN Call State  
 Refresh ALL Release Answer 9-1-1 Refuse Call History  
 803-0171 14:14 01/05  
 2550 E MORRIS BLVD -  
 MISTOWN TN 100 WRLS  
 IZON WIRELESS  
 P# 803-0171  
 423-736-2974 LEC:VZW  
 3.261797 +36.219081  
 100 of 100 1/5/2013 2:14:10 PM Clear  
 Case no. N/A

**Cocke 911** **Grainger 911** **Greene 911** **Hawkins 911**  
 Voice Voice Voice Voice  
**Jefferson 911** **Knox 911**  
 Voice Voice  
**Language Line** **THP** **TEMA** **FBI** **Poison Control**  
 Voice Voice Voice Voice Voice  
**911 Admin** **MPD** **HCSD**  
 Voice Voice Voice  
 MAIN **TRANSFER** TOW WARRANTS EMS HOSPITALS MPD HCSD MISC

Answer DND Prev Calls Non Ex Hold Flash Keypad Speed Dial Ringback Volume TTY Release

# Seeking a new radio...

- ▶ After 20 years of service, Orbacom has exceeded end of life expectations and has been retired.
- ▶ The search for an appropriate console system resulted in purchase of the Avtec Scout.
- ▶ Featured fully networked VoIP capabilities and integrated with VoIP phone system.
- ▶ VoIP networking capabilities eliminates old DC and tone lease lines, improved audio capability, system alarms, and self-monitoring features.
- ▶ Network integrations and resources
- ▶ Extensive on-site training (at Avtec) prior to installation.
- ▶ VERY end-user friendly



IRR / History (15)

Start Time	Dir / Play	Endpoint	FRR / Caller ID	Talkgroup / Freq	NAC Code	Status	Indicators
15:48:00	00:09	MPD / HCSO PL...		Freq 1			
15:48:00	00:09	MPD / HCSO PL...		Freq 1			
15:47:40	00:09	MPD / HCSO PL...		Freq 1			
15:47:40	00:09	MPD / HCSO PL...		Freq 1			
15:47:40	00:09	MPD / HCSO 911...		Freq 1			
15:45:25	00:01	USAC 42 Pine Bl...		Freq 1			

Emergency control panel with buttons: PATCH 1, Monitor, SMIL SELECT, DISABLE, HEADSET MONITOR, HOLD.

Front Door, EMS S.W. 115,205

AUX #1, Radio #1, Radio #4, Radio #6, FIRE / EMS, Paging, Phones, Cameras

Hambles County  
15:48:31  
Saturday, January 05, 2013  
UPS Major, UPS Minor, Generator, Battery, Power Fail

Volume, Resource List, CleanScreen, Start Screen (Paging)

PTT

S1, S2

ALERT TONE 1, ALERT TONE 2, ALERT TONE 3, 911 Lines OFF



### Relay Controls

Front Door	Future
Back Door	Future
Gen Door	Future
Equipment Room	Future
Dispatch Door	Future
Alarms Reset	Future
Red Light	Future
Generator Start	Future


### Site Alarms

Crockett Intrusion Alarm	7th North Intrusion Alarm
Crockett Fire Alarm	7th North Fire Alarm
Crockett Power Failure	7th North Power Failure
Crockett Equip Failure	7th North Equip Failure
Pine Brook Intrusion Alarm	
Pine Brook Fire OK	
Pine Brook Power OK	
Pine Brook Equip OK	

### Building Alarms

UPS - Major OK	Future
UPS Minor - OK	Future
Generator Stopped	Future
Battery - OK	Future
Utility Power - OK	Future
EMS S.W. 155.205	Future
Future	Future
Future	Future

# The challenge of an Ethernet Based Network

- ▶ Required to build new high-speed network, capable of smooth VoIP service.
  - ▶ Used Cisco Systems switches and routers and HP ProCurve switches.
  - ▶ Used extensive VLANing to build an efficient LAN network.
  - ▶ First implementation of VPLS over fiber.
  - ▶ Allocation of necessary bandwidth for minimum network interruption.
- 

# How it's Working Today?

- ▶ Phone
  - Performing to acceptable standards.
  - MIS addition a HUGE asset for QA and compliance analysis
- ▶ CAD
  - Upgrade in 2013 to Global/CISCO v14.
- ▶ Mapping
  - Upgrade in 2013 by DDTI. Will fully comply with NENA and State of TN TIPS / GIS for NG911
- ▶ Radio
  - Avtec performing to all expectations.





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*Thank you for attending.*



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