



Division of Statewide  
Emergency Telecommunications



# State of Connecticut PSAP Update

# Agenda

- Introductions
- RFP Process and Review
- Key Resources / Organizations
- Overview of Solution
- Key Features / Benefits / PSAP Impacts
- Call Flow
- Project Timeline
- Service & Support
- Training
- Change Control
- Text-to-911
- Disaster Recovery
- Next Steps
- System Demonstration
- Questions and Answers

# Vision

- The Connecticut statewide ISDN Enhanced 911 emergency telephone system has been in operation for over fourteen years and must be replaced due to a lack of equipment and software support.
- Connecticut will deploy a Next Generation 911 (NG911) system using the new Public Safety Data Network to deliver calls to PSAPs. Why NG911? The new system will be capable of processing – in addition to 911 voice calls – emergency calls from devices that transmit text messages, pictures and video when such calls are delivered to us by the carriers in the future. It will place us in a good position to manage:
  - Increasing percentage of wireless calls
  - Adoption of and migration to VoIP by the public
  - New technologies with IP 9-1-1 requirements - Telematics
  - Interoperability demands – needs a common networked platform
  - Tremendous public expectations – 9-1-1 anywhere, anytime, from any device

# RFP Process and Review

- DSET Staff created a Request for Information (RFI) in order to learn how vendors would propose to design and deliver statewide NG911 system.
- Responses to the RFI were received from eight vendors in February of 2011. These were followed by product demonstrations at DESPP HQ.
- DSET Staff then created the RFP outline draft using the DAS template, the NENA i3 capabilities matrix, the information learned through the RFI process, the existing E911 contract and performance requirements, and staff input
- Members of the PSAP community, DSET staff and outside consultants worked together as the RFP Review Committee through multiple meetings to edit and improve the draft RFP, working line-by-line

# RFP Process and Review (cont'd)

- After six months of work, DAS posted RFP #11PSX0202 for a “Next Generation 9-1-1 Emergency Telecommunications System.” Responses were received from ten vendors on November 30, 2011
- The RFP Review Committee, meeting at DSET, reviewed and graded each of the vendor responses
- DAS, with DSET’s participation, began negotiations with the highest-scoring vendor, AT&T
- The contract was signed on November 4, 2013

# State of Connecticut Key Resources

- Dan Czaja - Core/ESInet Team Lead
- Chuck Fuller - Network Team Lead
- Mike Guerrera - Site Implementation Team Lead
- John Masciadrelli - NOC Team Lead
- Carey Thompson - Communications Team Lead
- Steve Verbil - Text-to-911, Disaster Recovery
- Jerry Werner - PSDN
- Jerry Zarwanski - Operations Team Lead
- Bill Youell

# Public Safety Key Resources

## PSAP Advisory Group

- Joseph Kronenberger – Deputy Director, Central Communications, City of Middletown
- George Peet – Deputy Director, City of New Haven Public Safety 911
- Teresa Lockwood – Lead Dispatcher, Connecticut State Police Troop H
- Kevin Webb – Communications Manager, Litchfield County Dispatch

# AT&T / TCS Key Resources

- Denise Frasca – lead Project Manager
  - Bill Verrastro, Scott Smith, Chris Manouse, Rick Caldwell, Jim Hunt
- Nancy Carter – Training
- Chris Vastola – Advanced Technical Solutions
- Keith Martin – Technical Lead
- Pete Fontneau – ATT Public Safety
  - Jean-Claude Rizk, Darren Light
- ATT NRC, Special Services, Translations
- Anna Hastings, Bob Tilden, Mike Kennedy, Robin Erkkila – Product Management
- Jon Wellinger – Executive Sponsor
  - Kathleen Johnson

# Overview of Solution

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# Key Features and Benefits

- NENA i3 Compliant
- End to End solution (Call Routing and Call Handling)
- Engineered to 99.999% Core Availability
- Future Proof Software
- Policy Routing Capabilities
- GIS Routing Capabilities
- Text to 911 Capabilities
- Updated / Improved Features and Functions (Demo)

# Project Timeline

## Major Milestones

1. Network Control Centers (NCC) – December 2014
2. First 10 PSAPs – February 2015

New Britain ERC  
Wolcott PD  
Wilton PD  
Shelton PD  
Newington PD

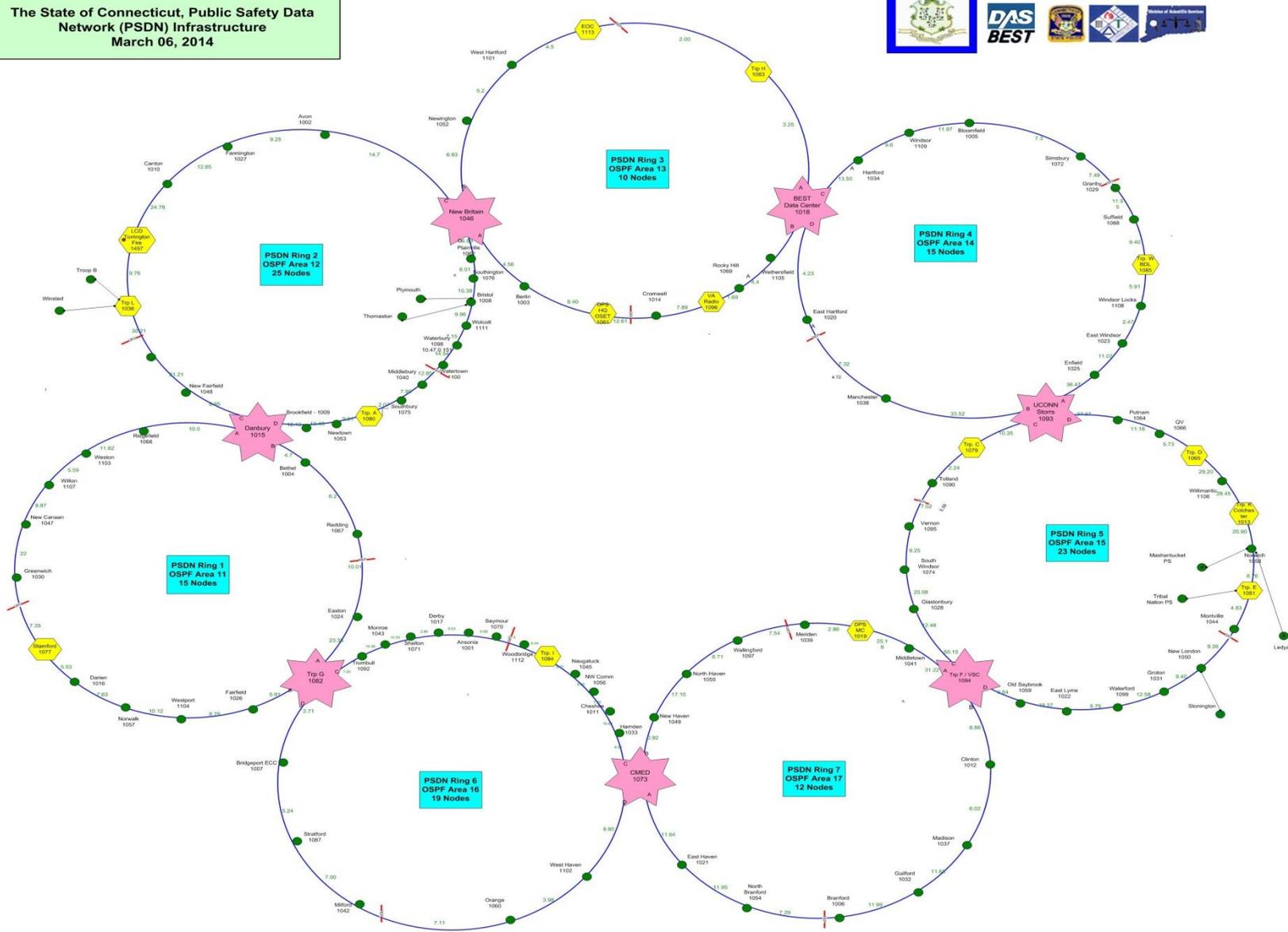
Enfield ECC  
Valley Shore ECC  
Middletown Central Comm.  
Fairfield ECC  
Mashantucket Public Safety

3. Remaining PSAPs – December 2015
4. Final Project Acceptance – February 2016



# PSDN Overview

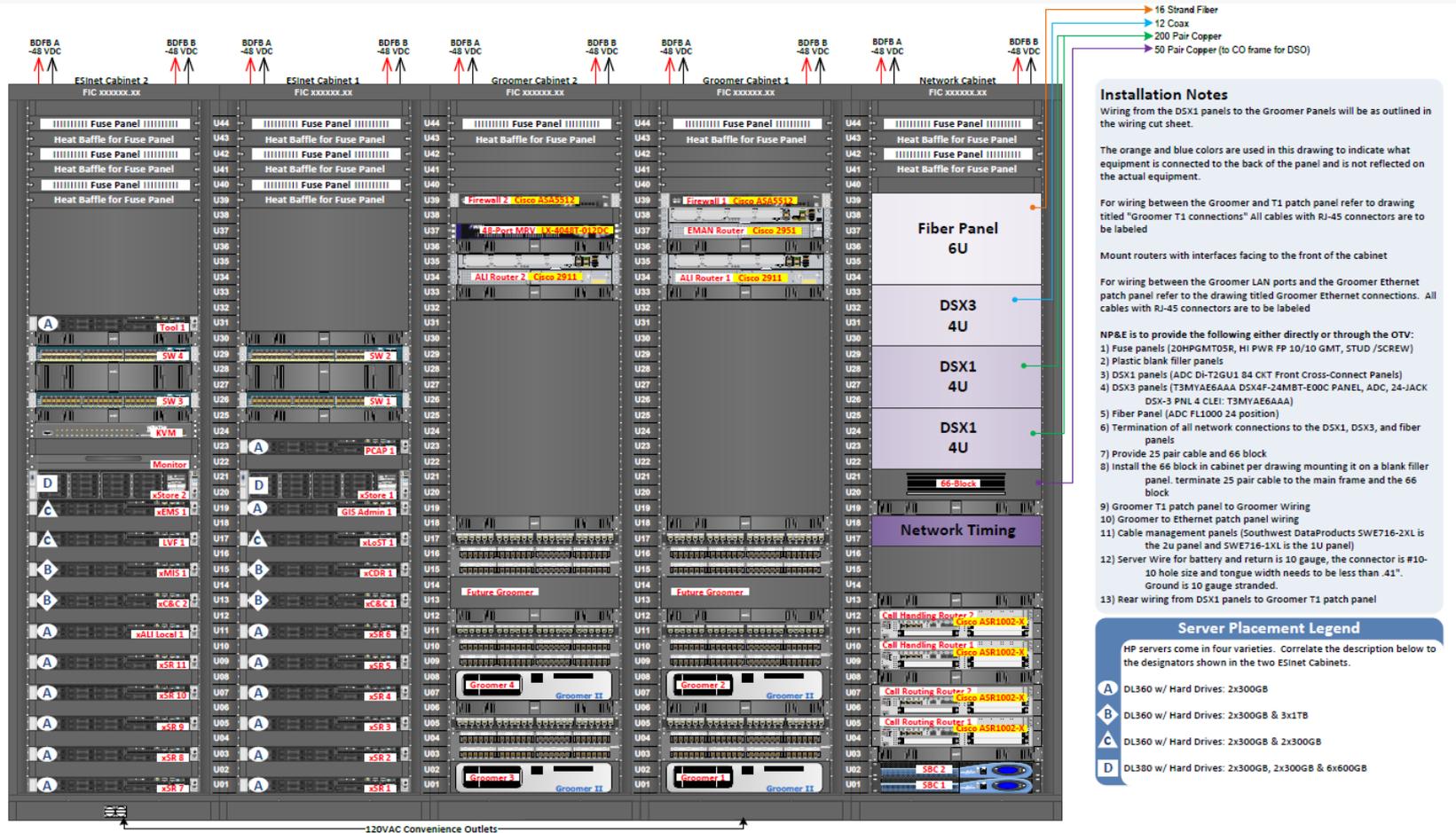
- Connecticut has constructed the Public Safety Data Network (PSDN), a high-speed, carrier-class infrastructure that is intended to satisfy all networking connectivity requirements for a NG911 Emergency Services Intranet (ESI-net) to all PSAPs
- The PSDN is built using ring architecture and 50-millisecond failover in order to provide “five nines” reliability
- NG911 traffic is separated physically and logically from all other traffic, to preserve NG911 priority
- The PSDN is monitored by a 24x7 operations center to ensure that any issues are addressed appropriately and within defined Service Level Agreements



**Legend**

- DWDM Node - Standard With ONS and CPT 600/50
- DWDM Node - High Bandwidth With ONS and CPT 600/50
- ★ DWDM Node - Ring Interconnect With ONS (4 chassis) and 2-CPT 600/50
- N:NN Miles between Sites
- DWDM Segment

# Network Control Center Architecture



**Installation Notes**  
 Wiring from the DSX1 panels to the Groomer Panels will be as outlined in the wiring cut sheet.

The orange and blue colors are used in this drawing to indicate what equipment is connected to the back of the panel and is not reflected on the actual equipment.

For wiring between the Groomer and T1 patch panel refer to drawing titled "Groomer T1 connections" All cables with RJ-45 connectors are to be labeled

Mount routers with interfaces facing to the front of the cabinet

For wiring between the Groomer LAN ports and the Groomer Ethernet patch panel refer to the drawing titled Groomer Ethernet connections. All cables with RJ-45 connectors are to be labeled

NP&E is to provide the following either directly or through the OTV:

- 1) Fuse panels (20HPGMT05R, HI PWR FP 10/10 GMT, STUD /SCREW)
- 2) Plastic blank filler panels
- 3) DSX1 panels (ADC DI-T2GU1 84 CKT Front Cross-Connect Panels)
- 4) DSX3 panels (T3MYAE6AAA DSX4F-24MBT-E00C PANEL, ADC, 24-JACK DSX-3 PNL 4 CLEI: T3MYAE6AAA)
- 5) Fiber Panel (ADC FL1000 24 position)
- 6) Termination of all network connections to the DSX1, DSX3, and fiber panels
- 7) Provide 25 pair cable and 66 block
- 8) Install the 66 block in cabinet per drawing mounting it on a blank filler panel. terminate 25 pair cable to the main frame and the 66 block
- 9) Groomer T1 patch panel to Groomer Wiring
- 10) Groomer to Ethernet patch panel wiring
- 11) Cable management panels (Southwest DataProducts SWE716-2XL is the 2u panel and SWE716-1XL is the 1U panel)
- 12) Server Wire for battery and return is 10 gauge, the connector is #10-10 hole size and tongue width needs to be less than .41". Ground is 10 gauge stranded.
- 13) Rear wiring from DSX1 panels to Groomer T1 patch panel

**Server Placement Legend**

HP servers come in four varieties. Correlate the description below to the designators shown in the two ESinet Cabinets.

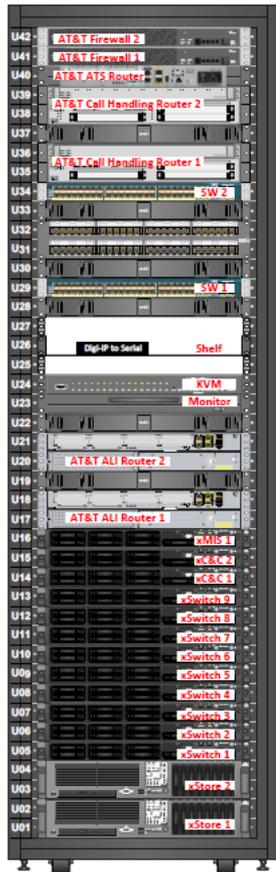
- A DL360 w/ Hard Drives: 2x300GB
- B DL360 w/ Hard Drives: 2x300GB & 3x1TB
- C DL360 w/ Hard Drives: 2x300GB & 2x300GB
- D DL380 w/ Hard Drives: 2x300GB, 2x300GB & 6x600GB

**CT Bridgeport NCC – ESinet Call Routing Bay Face Layout**

at&t		Title:	Drawing Status:	Project Number:
Revision / Date:	4/24/2014	Customer Name:	State of Connecticut	Product Family:
Drawn by:	Kath Martin	PROPRIETARY INFORMATION		
Department:	AT&T Public Safety	Not for use or disclosure outside the AT&T companies except under written agreement		
File Name: 20140424 CT Bridgeport NCC Bay Face Layout.dwg				Page: 1 of 1

# State Host Site Architecture

## CT Troop G Host Bay Face Layout

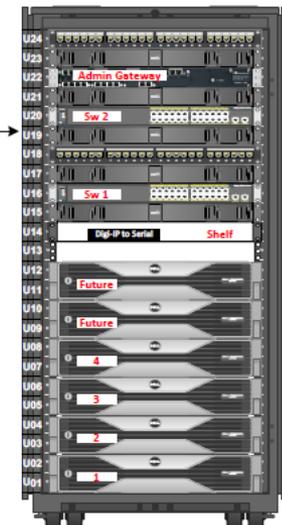


Host Device	Qty	Watts (each)	BTU
Firewall	2	180	1,229
Host Router	2	470	3,208
48-Port Switch	2	540	3,686
ATS Router	1	50	171
Digi Serial-to-IP Converter	1	15	51
KVM	1	50	171
Monitor	1	48	164
ALI Router	2	120	819
Server, 1U	12	540	22,116
Server, 2U	2	588	4,014
<b>Host BTU</b>			<b>35,628</b>

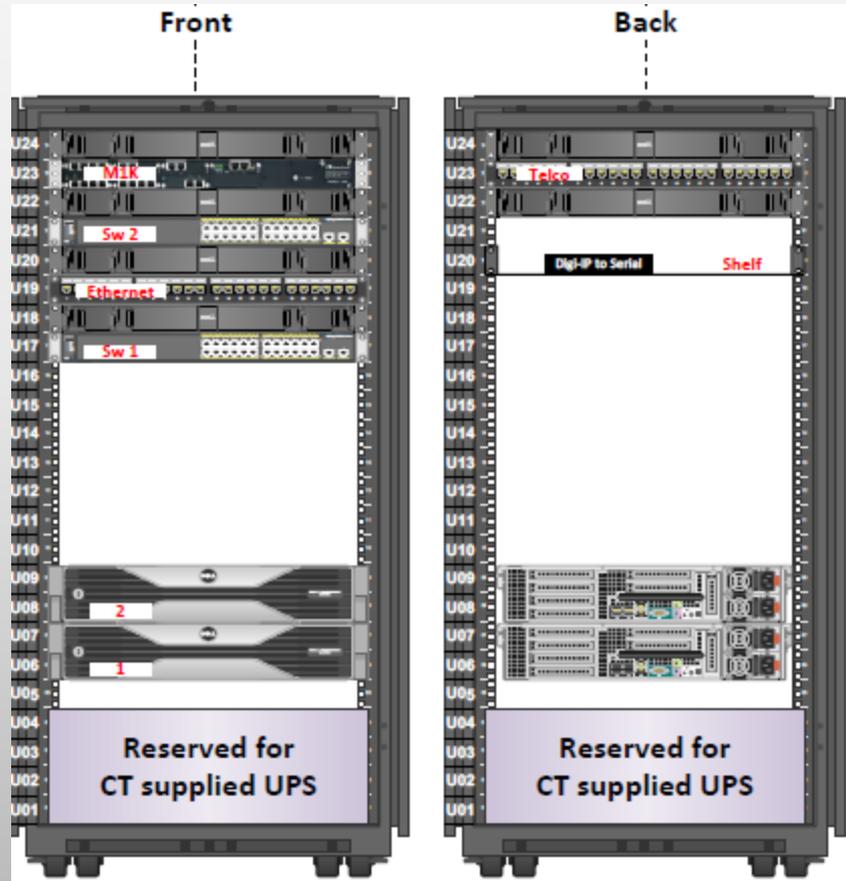
PSAP Device	Qty	Watts (each)	BTU
Admin Gateway	1	90	307
24-Port Switch	2	470	3,208
Serial-to-IP Converter	1	15	51
Workstation	4	1,100	15,017
Future Workstation	2	1,100	7,509
<b>PSAP BTU</b>			<b>26,092</b>

## CT Troop G Racks with BTU

## CT Troop G PSAP Bay Face Layout



# PSAP Site Architecture



# PSAP Solution Elements

- Typical PSAP Equipment List
  - System Equipment Rack
  - Workstation(s), Rack Mounted
  - Telephony Gateway(s) – Admin & Ring-down circuits
  - Wiring Patch Panel(s)
  - Printer, LaserJet
  - Ethernet Switch
  - Router and Uninterruptable Power Supply
- Telecommunicator Position
  - (2) 22” Widescreen LCD Monitors
  - Speaker Bar
  - Keyboard, Headset, Mouse

# SoCT/PSAP pre installation requirements:

- DSET Initial Site Visits Fall 2013
- Site Survey to be performed by AT&T techs
- Site Requirements to DSET (then DSET to PSAP) for space/electrical/air conditioning
- State/PSAP responsible to get site ready prior to equipment delivery
- PSAP provide update to DSET on site readiness
- DSET provide update to AT&T that site is ready for install

# PSAP Work Breakdown

ID	Task Mo	Task Name	Duration	Start	Finish	Predecessors
1		<b>PSAP Example - Cutover 01/07/2015</b>	<b>134 days</b>	<b>Wed 8/27/14</b>	<b>Fri 3/13/15</b>	
2		<b>Site Survey</b>	16 days	Wed 8/27/14	Thu 9/18/14	
3		Site survey completed by AT&T	<b>1 day</b>	<b>Wed 8/27/14</b>	<b>Wed 8/27/14</b>	<b>56FF-96 days</b>
4		Site modification requirements to SoCT	5 days	Thu 8/28/14	Thu 9/4/14	3
5		Site Survey portion of Workbook to TCS	15 days	Thu 8/28/14	Thu 9/18/14	3
6		<b>Detailed Database Gathering</b>	<b>27 days</b>	<b>Fri 9/19/14</b>	<b>Mon 10/27/14</b>	
7		Schedule Database Gathering with PSAP	5 days	Fri 9/19/14	Thu 9/25/14	5
8		Review Workbook (* Codes & Speed dials, Call Flow, Admin lines,	10 days	Fri 9/26/14	Thu 10/9/14	7
9		Compile Final Database Gathering Workbook	7 days	Fri 10/10/14	Mon 10/20/14	8
10		Customer Review and Acceptance of the Workbook	5 days	Tue 10/21/14	Mon 10/27/14	9
11		<b>PSAP Equipment</b>	<b>13 days</b>	<b>Tue 10/28/14</b>	<b>Thu 11/13/14</b>	
12		Review Equipment requirements in Accepted Workbook	5 days	Tue 10/28/14	Mon 11/3/14	10
13		Final BOM sent to Staging	3 days	Tue 11/4/14	Thu 11/6/14	12
14		Equipment Picked From Inventory	5 days	Fri 11/7/14	Thu 11/13/14	13
15		<b>Equipment Staging &amp; Provisioning</b>	<b>19 days</b>	<b>Fri 11/14/14</b>	<b>Fri 12/12/14</b>	
16		Equipment Received in TCS Staging Lab	5 days	Fri 11/14/14	Thu 11/20/14	14
17		Set Up equipment	2 days	Fri 11/21/14	Mon 11/24/14	16
18		Base Configuration of Equipment	6 days	Tue 11/25/14	Thu 12/4/14	17
19		Custom Configuration of Equipment based upon Workbook	6 days	Fri 12/5/14	Fri 12/12/14	18
20		equipment staging & provisioning complete	0 days	Fri 12/12/14	Fri 12/12/14	19
21		<b>Shipping to customer prem</b>	<b>8 days</b>	<b>Mon 12/15/14</b>	<b>Wed 12/24/14</b>	
22		Ship equipment to site	8 days	Mon 12/15/14	Wed 12/24/14	20
23		Shipping Complete	0 days	Wed 12/24/14	Wed 12/24/14	22FF

# PSAP Work Breakdown

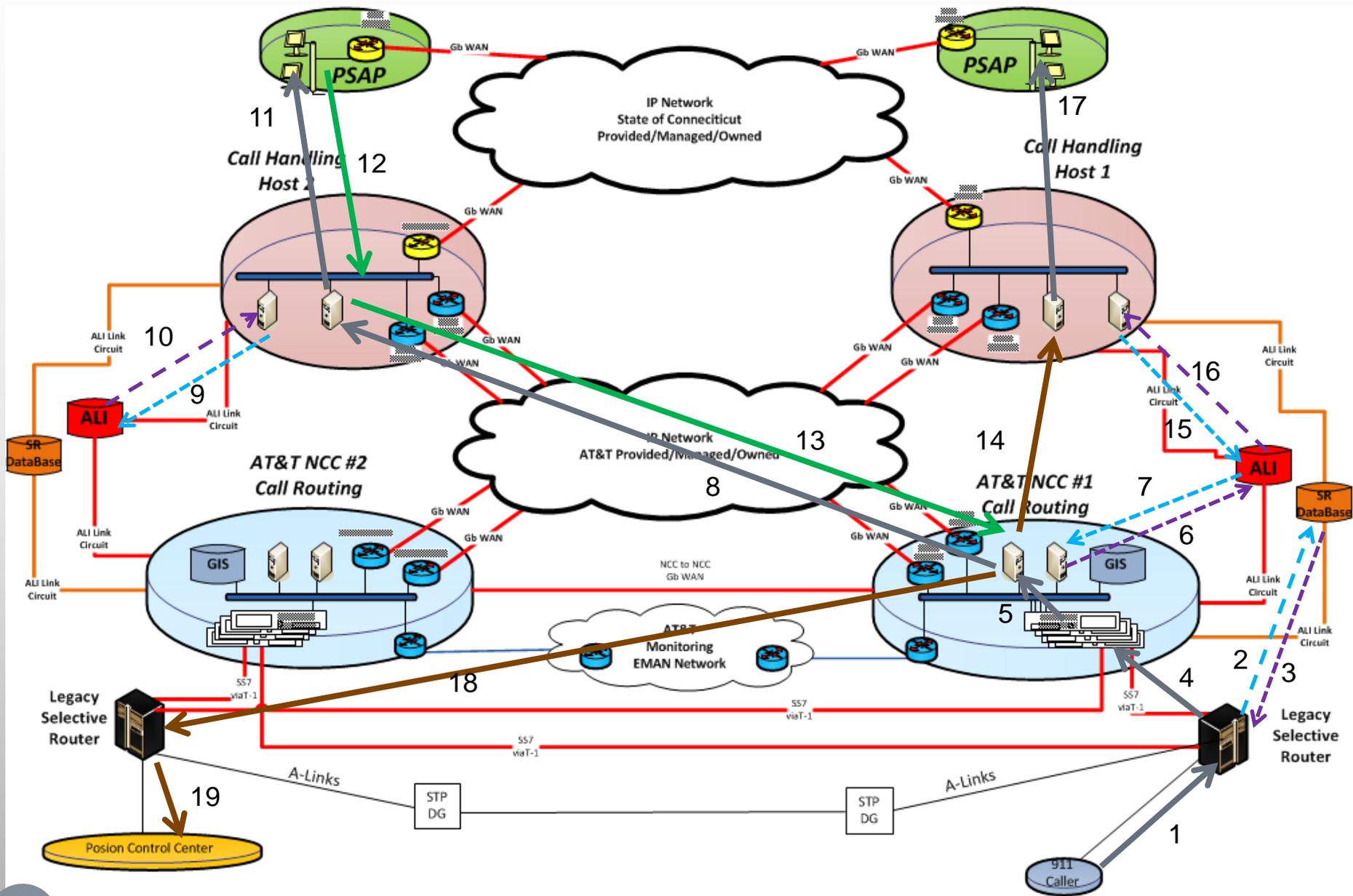
ID	Task Mo	Task Name	Duration	Start	Finish	Predecessors
24		<b>Site Readiness</b>	<b>68 days</b>	<b>Fri 9/5/14</b>	<b>Thu 12/11/14</b>	
25		<b>Site Preparation</b>	<b>68 days</b>	<b>Fri 9/5/14</b>	<b>Thu 12/11/14</b>	
26		SoCT Receives Site Remediation Info from Tech & Notifies PSAP	5 days	Fri 9/5/14	Thu 9/11/14	4
27		PSAP Work Orders for remediation Work	1 day	Wed 9/17/14	Wed 9/17/14	28SS-20 days
28		PSAP Remediation work Performed	40 days	Wed 10/15/14	Thu 12/11/14	29FS-40 days
29		Customer Confirms Site Readiness to DSET/AT&T	1 day	Thu 12/11/14	Thu 12/11/14	22FS-10 days,4
30		AT&T prewire (may be started/completed earlier)	15 days	Wed 11/19/14	Thu 12/11/14	29FF
31		PSAP to arrange for Radio/CAD Vendor on site for install & Testing	0 days	Mon 12/8/14	Mon 12/8/14	37FF-10 days
32		<b>Equipment Installation</b>	<b>2 days</b>	<b>Thu 12/18/14</b>	<b>Mon 12/22/14</b>	
33		Equipment received & Inventoried at PSAP	0 days	Thu 12/18/14	Thu 12/18/14	52FF-11 days
34		Asset Tags on Eqpt/Serial Numbers recorded on sheet	0 days	Thu 12/18/14	Thu 12/18/14	33FF
35		Installation of PSAP Equipment (Back room and Front Room)	2 days	Fri 12/19/14	Mon 12/22/14	33
36		Equipment installation complete	0 days	Mon 12/22/14	Mon 12/22/14	35
37		<b>Interface with customer vendors</b>	<b>1 day</b>	<b>Mon 12/22/14</b>	<b>Mon 12/22/14</b>	
38		Radio	1 day	Mon 12/22/14	Mon 12/22/14	36FF
39		CAD	1 day	Mon 12/22/14	Mon 12/22/14	36FF
40		Analog admin lines	1 day	Mon 12/22/14	Mon 12/22/14	36FF
41		<b>Training</b>	<b>24 days</b>	<b>Mon 12/1/14</b>	<b>Tue 1/6/15</b>	
42		Schedule Administration & Telecommunicators	5 days	Mon 12/1/14	Fri 12/5/14	52FF-20 days
43		Train Administrators	1 day	Mon 12/22/14	Mon 12/22/14	52FF-9 days
44		Train Telecommunicators	7 days	Wed 12/24/14	Tue 1/6/15	52FS-8 days
45		<b>Testing</b>	<b>7 days</b>	<b>Fri 12/19/14</b>	<b>Wed 12/31/14</b>	
46		Test PSAP connectivity back to host	5 days	Fri 12/19/14	Mon 12/29/14	52FF-6 days

# PSAP Work Breakdown

ID	Task Mo	Task Name	Duration	Start	Finish	Predecessors
47		End to End PSAP precutover testing (call routing thru ESINet)	1 day	Wed	Wed	53FF-5 days
48		Testing complete	0 days	Wed 12/31/14	Wed 12/31/14	47
49		<b>Cutover</b>	<b>3 days</b>	<b>Tue 1/6/15</b>	<b>Thu 1/8/15</b>	
50		Go/No go meeting	1 day	Tue 1/6/15	Tue 1/6/15	52FF-1 day
51		Review backout plan	1 day	Tue 1/6/15	Tue 1/6/15	50FF
52		Cutover - All vendors participate	1 day	Wed 1/7/15	Wed 1/7/15	
53		Cutover clean up work	1 day	Thu 1/8/15	Thu 1/8/15	52
54		New repair number and procedures provided	1 day	Thu 1/8/15	Thu 1/8/15	53FF
55		Service Manager Handoff	1 day	Thu 1/8/15	Thu 1/8/15	54FF
56		<b>Post cutover activities</b>	<b>6 days</b>	<b>Fri 1/9/15</b>	<b>Fri 1/16/15</b>	
57		Removal of Existing 911 Equipment	1 day	Fri 1/9/15	Fri 1/9/15	52FS+1 day
58		Record serial numbers & asset tags recorded for all removed	1 day	Fri 1/9/15	Fri 1/9/15	57FF
59		Provide project management spreadsheet of inventory, S/N &	2 days	Mon 1/12/15	Tue 1/13/15	58
60		PM to Provide Spreadsheet of inventory, SN & Asset Tags to DSET	3 days	Wed 1/14/15	Fri 1/16/15	59
61		<b>Disposal of Palladium equipment</b>	<b>1 day</b>	<b>Mon 1/12/15</b>	<b>Mon 1/12/15</b>	
62		Decommision/Remove hard drives??	1 day	Mon 1/12/15	Mon 1/12/15	57
63		Dispose of hard drives per State direction??	1 day	Mon 1/12/15	Mon 1/12/15	57
64		Dispose of equipment per state request??	1 day	Mon 1/12/15	Mon 1/12/15	57
65		Package Equipment??	1 day	Mon 1/12/15	Mon 1/12/15	57
66		<b>Customer acceptance</b>	<b>45 days</b>	<b>Wed 1/7/15</b>	<b>Fri 3/13/15</b>	
67		Installation Acceptance of PSAP	1 day	Wed 1/7/15	Wed 1/7/15	52SS
68		Full Functionality Acceptance of PSAP	45 days	Wed 1/7/15	Fri 3/13/15	52SS

# Call Flow

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# Service & Support:

## Continuation of Existing Service

- Project Management
- Service Management
- NOC(s)
- Technicians
- Tier II/III/IV Support
- Training
- Labs
- Frontier Communications

# Training

- Led by Nancy Carter
- Building new AT&T Training Center – Science Park, New Haven
- Two concurrent classes available – up to 10 people per class
- Just in time training approach
  - Attend class within week of installation at PSAP

# Change Control

- Complexity of Offer
- Significant change for all parties
- Phased approach to features/functions
- Controlled introduction
  - Project
  - Overall term

# Text to 9-1-1

- The FCC has proposed rules which would require wireless carriers to provide text-to-911 (TT911) services at the end of 2014
- The four major wireless carriers have signed a voluntary agreement to provide TT911 services by May 15<sup>th</sup> to PSAPs which are prepared to receive text messages
- Our legacy E911 system cannot be modified to receive text messages
- NG911 is designed to deliver TT911 calls
- We will begin accepting TT911 calls during the pilot PSAP testing period at two of the ten pilot sites

# Text to 9-1-1

- J-STD-110 – 3 methods of SMS to 9-1-1 delivery:
  - TTY Emulation
  - Web Client GUI
  - Native i3 using MSRP
- Benefits of native i3 via CT ESInet
  - Messages from all carriers delivered through a single interface
  - Integrated into the Call Handling platform / MIS reports
  - Ability to determine what PSAPs will accept text messages, what geography, and when
  - Establish maximum number of simultaneous text sessions per PSAP
  - Ability to transfer text sessions to another PSAP
  - Connecticut specific “bounce-back” messages
  - Enterprise metrics and reports
  - Basis for additional multi media – over the top, MMS, etc.

# Disaster Recovery

- In the State's new role as the network provider, we recognize the need for reliable safety-of-life services
- The FCC requires 911 Service providers to take “reasonable measures to ensure 911 circuit diversity... and diversity of network monitoring links”
- We are investigating both terrestrial and satellite (VSAT) disaster recovery (DR) networks

# Call Handling Demonstration

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# Next Steps

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- **Communication**

- **Future Update Meetings**
- **DSET Website**
- **Email Blasts**
- **Advisory Group**
- **Individual PSAP Communication**

- **Site Readiness**

- **Site Surveys**

THANK YOU FOR COMING

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# Call Steps (high-level) (PRINT OUT AND DELETE PRIOR TO PRESENTATION WITH PSAPS)

## High Level Call Flow for St of CT

1. Caller dials 9-1-1 and PSTN routes to serving Legacy Selective Router (LSR) (Class 5 office)
2. LSR sends callers ANI to Selective Routing Database (SRDB)
3. SRDB returns Emergency Services Number (ESN)
4. LSR (based on ESN) routes to appropriate Emergency Services IP Network Node's SS7/IP Gateway at the Nine-One-One Control Center (NCC) with Callers ANI
5. Gateway send call to the NCC's xSR (soft switch)
6. NCC dials, or sends Automatic Line Identifier database (ALI) by sending callers ANI.
7. ALI database returns Automatic Location Identifier (ALI) to NCC
8. NCC extracts ESN and routes to appropriate HOST via SIP/RTP
9. Host bids for ALI
10. ALI database returns ALI
11. Host sends call and ALI to appropriate Call Taker, Call completes.

**PSAP call taker determines the caller is better served by another "on-net PSAP" and initiates a call transfer.**

12. Call taker hook-flashes the call and inputs digits to transfer call to alternate PSAP to the Call Handling Host.
13. Call Handling Host send the Call Routing NCC via SIP Refer message indicating a transfer call.
14. The Call Routing NCC send an Invite to the Call Handling host for another PSAP
15. The Call Handling Host dials for ALI
16. ALI is returned
17. Call Handling host establishes call to another Call Taker.

**Once connected the Call Taker requesting the transfer usually drops the original call and is taken out of the call flow.**

18. Given the transfer request is for an 'Off-Net' call, i.e., Poison Control Center, the Call Routing NCC will send the call out to the PSTN via 10 digit.
19. The PSTN will send call to the receiving Poison Control Center.