FINAL

MLTS E9-1-1 Workshop Report

In Rulemaking 10-04-011 to Improve Public Safety by Determining Methods for Implementing Enhanced 9-1-1 Services for Business Customers and for Multi-line Telephone System Users

California Public Utilities Commission

Communications Division

October 2010

Memorandum

This workshop report was prepared by Michael Aguilar, Communications Division Regulatory Analyst. The report summarizes the presentations made at the Public Workshop held at the Commission on July 26 and 27, 2010, and on the Q&A and participant discussions that followed the presentations. Some of the information in this report was provided after the workshop by utilities and other participants in response to staff inquiry, and to clarify issues raised during the workshop.

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Executive Summary

On July 26 and 27, 2010 the Communications Division (CD) held a public workshop on Provisioning E9-1-1 Caller Location Information for phones served by Multi-line Telephone Systems (MLTS) such as a PBX, as ordered by Rulemaking 10-04-011.

CD characterized the workshop as primarily informational in nature, and asked stakeholders to address three main subject areas:

1) Identify the public safety need for accurate caller location information on 9-1-1 calls
2) Describe how public utilities and other service providers work with business customers in implementing best practices for provisioning caller location information needed for timely emergency response
3) Identify the feasibility and cost to businesses and other property owners of provisioning caller location information needed by Public Safety Answering Points (PSAPs) and field responders

The following summarizes the major points of the workshop presentations and stakeholder comments[1].

Public Safety Need for accurate caller location

- PSAPs' primary concern is that inaccurate reporting of PBX/MLTS information to the PSAP is a major public safety concern that causes delayed response to emergency situations.

- PSAPs presented examples of representative problems with 9-1-1 calls originating from PBXs at large hospitals, public schools, large businesses, chain stores, local government installations, and assisted living facilities -- in all regions of California, within small towns and the State's largest metropolitan areas.

- PSAPs reported that the problems involved the misrouting of PBX 9-1-1 calls to the wrong PSAP, and/or the displaying of caller information to the PSAP that did not show the caller's actual location and telephone number. The lack of accurate location information results in limited public safety resources being directed to the wrong location, and can be life threatening if the caller can not supply the correct location.

- These problems occur in certain high risk MLTS installations and configurations when the PBX owner/manager does not provision accurate caller location information in the 9-1-1 database, which will result in the PSAP screen displaying the billing or main address and the phone number of the PBX trunk or network connection instead of the 9-1-1 caller's actual location and phone number.

- PSAPs identified High Risk PBX/MLTS Environments as:

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[1] This executive summary and the following summary of workshop presentations may also include at times some characterizations of the participants' presentations and stakeholder comments. Parties will have the opportunity to comment on this workshop report and any characterization contained in it.

- Multiple or remote buildings and locations served by a central/host PBX with only one address and the main trunk telephone number (TN) stored in the 9-1-1 database
- Assisted living or medical facility with a phone in each living unit or patient room, but with only the main address and front desk TN provisioned in the 9-1-1 database
- Installations that do not provide on-site notification that a 9-1-1 call was made, and therefore the 24/7 attendant or security cannot assist the PSAP during call-back to the main billing number or trunk TN
- Installations with no live person attendant to answer a PSAP call-back to the main trunk TN

- PSAPs did not identify caller location problems with 9-1-1 calls from small businesses at a single location, or with calls from a Centrex customer.

- No other participant presented information or comments contrary to the PSAP findings.

Public utility tools, services and best practices for provisioning MLTS phone station information in the 9-1-1 Database

- AT&T and Verizon each offer an optional web-based PS/ALI[2] service which permits a PBX/MLTS owner/manager to provision accurate caller location information in the 9-1-1 database.
  - PS/ALI services are available to any PBX owner/manager in California including CLEC customers and customers in the service territories of the other ILECs. The customer would need to contact the dial tone provider to arrange for subscribing to PS/ALI service and the additional services that permit delivery of the 9-1-1 caller ID from the PBX phone station to the PSAP.
  - Third parties observed that AT&T's PS/ALI one-time tariff rate is very low compared to PS/ALI tariffs in other states.

- AT&T and Verizon identified customer responsibilities involving the process for establishing, submitting and updating 9-1-1 database records for PBX/MLTS end users' phone stations.
  - The PS/ALI customer is required to purchase additional services including Direct Inward Dial (DID) TNs for end user phone extensions, and in some cases, circuits for transport of the PBX phone station caller ID to the 9-1-1 network.
  - Most current PS/ALI customers utilize their existing PRI ISDN[3] circuits to deliver the 9-1-1 voice call with the associated phone station caller ID to the local switch, for routing to the PSAP. AT&T's PRI ISDN customers who wish to send the phone station caller ID with the 9-1-1 voice call are subject to additional non-recurring and recurring monthly charges[4]. Verizon does not charge its PRI ISDN customers for sending the PBX 9-1-1 phone station caller ID to the local switch.

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[2] Private Switch/Automatic Location Information (PS/ALI) as explained in detail on page 5 of the OIR.

[3] Primary Rate Interface Integrated Services Digital Network (PRI ISDN) is the equivalent of a T1 circuit at total signaling speed of 1.544 Mbps in support of 24 channels, Newton's Telecom Dictionary.

[4] Inform 911 for ISDN PRI as described in AT&T California Guidebook, Part 17, Section 2.

- Verizon plans to revise its PS/ALI tariff to streamline the process, minimize the need for customer legal review of ICB contracts, reduce total customer costs, and eliminate utility monthly billing expenses.
- Neither utility offers XML[5] formatting for customer transmittals of PS/ALI database records which can serve as a basis for programming automatic data exchange between a customer's computer system and the 9-1-1 database.[6]

- Local Exchange Carriers did not provide examples of written standard operating procedures or Best Practices policies which instruct sales and customer service personnel on how to inform and assist customers regarding MLTS E9-1-1 issues.
  - Several carriers acknowledged that their business processes in this regard need to be improved, and plan to upgrade their internal protocols and information resources to support increased concern from customers about access to emergency services and interest in E9-1-1 solutions.

Feasibility and costs to businesses and other property owners of provisioning MLTS E9-1-1 caller location information

- MLTS equipment manufacturer AVAYA and third party E9-1-1 solution providers identified several trends that have made solutions more feasible for the MLTS owner/operator:
  - For the last ten years, major equipment manufacturers have built E9-1-1 capabilities into new models and PBX upgrades. It is very rare to find a PBX in use that cannot be programmed to deliver the caller ID needed to retrieve caller location information.
  - Lower cost ISDN PRI circuits are now more common, and expensive mileage-based CAMA trunks are no longer required.
  - Third party MLTS E9-1-1 solutions are going down in cost and are available for under $5000. Small business solutions can be as low as $1250 for a one-time implementation fee and $65 to $100 per month in recurring fees.
  - The VoIP MLTS/PBX platform natively provides improved support for 9-1-1 for multi-location customers, and automated solutions can discover and update phone locations as they change which greatly reduces the administrative burden and cost to the business owner of tracking Moves/Adds/Changes (MAC) in a VoIP installation.
  - SIP Trunking is more available from Internet Telephony Service Providers (ITSP)[7] permitting the smallest enterprise VoIP PBX system to send caller ID with the 9-1-1 call.

- Third party solution providers offered several case studies of implementing MLTS E9-1-1 for California clients. Examples ranged from one time implementations at a single location on a project completed within a month, to major turnkey installations requiring high-value project

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[5] Extensible Markup Language (XML) "allows companies to automatically order from and sell to each other -- without having to have a human in between physically translating between the different systems. The vast bulk of the largest companies in the world use XML for electronic transactions with their customers or suppliers". Newton's.

[6] As described by the NENA Data Technical Committee in its recommendation for adoption of NENA Version 4 for PS/911 data exchange, NENA-06-003 "Private Switch (PS) E9-1-1 Database Standard, page 8 of 17.

[7] Session Initiation Protocol (SIP) is a VoIP signaling protocol offered by an ITSP permitting IP PBXs and traditional TDM PBXs to use lower cost IP service through a SIP adjunct device as an alternative to PRI ISDN service.

management and on-going database maintenance for clients with extensive facilities and multi-state locations.
- o Most of the case studies took place during a conversion from a traditional TDM PBX to a VoIP installation.
- o Educating the customer about MLTS E9-1-1 needs to be part of the sales process.
- o Flexibility in approach is needed since most customers don't have everything in place to implement a solution, and utilizing existing customer databases (HR, telephone station lists or phone logs) reduces the burden on the customer.
- o Many customers don't want to be bothered with maintenance, but the practice of daily maintenance needs to be emphasized. Site audits are important for developing a plan for maintenance, and establishing a reminder system that emails the customer about updates has also proven very useful.
- o Automated on-site notification to customer security or management was provisioned in large facilities, utilizing screen pop ups and SMS text messages.

- No business or private property owner association agreed to participate in the workshop despite CPUC outreach efforts. But information was presented from individual businesses and MLTS owners who were concerned about potential caller location problems and had requested assistance on E9-1-1 requirements and solutions.
  - o A healthcare provider faxed a letter to the CPUC documenting its difficulties in finding MLTS E9-1-1 information, and requesting the CPUC to establish regulations, public outreach and proactive customer assistance from 'telco' providers.
  - o The California 9-1-1 Office presented 13 examples of requests it has received from schools, hospitals, network engineers, consultants, counties, medical providers, equipment suppliers, insurance companies, security consultants, solution providers, and VPCs requesting information on MLTS E9-1-1 guidelines, regulations, legal requirements, or best practices.
  - o California State University Fullerton provided case studies of how MLTS E9-1-1 was provisioned on three Cal State campuses utilizing PS/ALI and campus phone station location databases.

- Utilities did not offer information about the views of their MLTS/PBX customers regarding the feasibility and cost of provisioning E9-1-1 caller location information.

Participant Conclusions and Recommendations

- Identifying the 9-1-1 caller's location is a challenge involving the individual, the PBX/MLTS owner, the local carrier/service provider, other third parties, and government agencies responsible for providing public safety.

- Participants repeatedly stated that there is a lack of public understanding and knowledge of the PBX E9-1-1 caller location problem, and a public education program could help solve that problem. In addition, most businesses and MLTS installers don't understand how E9-1-1 works, how to fix it or where to find information about it.

- MLTS Owners and installers are often on their own when trying to test 9-1-1 call routings and don't know who to contact to arrange it.
  - o Several parties asked CALNENA to establish statewide testing protocols to address this issue.

- The participant from the 9-1-1 Office recommended that the CPUC create a reference point on its website with guidelines, educational materials, links to other resources, and a statement of benefits to ensure that the MLTS end user has access to 9-1-1 with the accurate location provisioned and displaying at the PSAP.

- 9-1-1 County Coordinator Task Force asked whether SETNA[8] funds could be used to help subsidize PBX owner costs of provisioning E9-1-1 caller location information.

- PSAPs and other parties emphasized the need for a legal requirement on PBX/MLTS owners with penalties for non-compliance, since carriers and other service providers can not compel the provisioning of MLTS caller location:
  o AVAYA estimates that 70% of all PBXs are not provisioned to display accurate caller location information to the PSAP.
  o There are solutions in place for all technologies, and the only allowance should be for older PBXs that can not be programmed to deliver phone station caller ID which is very rare.
  o MLTS owners are often aware of these problems following the passage of a state E9-1-1 mandate, but without a penalty there is usually no compliance. In contrast, when Massachusetts passed its MLTS E9-1-1 law with penalties, business owners proactively contacted solution providers to arrange compliance.
  o In some states, the fire marshal will make some test calls to 9-1-1 during his inspection in order to determine that the correct location is being shown.[9]

- PSAPs recommend adoption of the NENA Model Legislation for MLTS E9-1-1[10] as a good template for regulations.
  o AVAYA worked on the national technical group that wrote it, and concluded that because PBX/MLTS owners were part of the effort, the model regulations should not be a burden to PBX owners.
  o Several participants agreed that the Model Legislation's 7000 sq. ft. exemption for small workplaces may be too broadly written and should be refined to more accurately reflect on-site conditions. AVAYA suggested that a fire safety inspection may offer the best approach for determining small business requirements and acceptable exemptions.

- CALTEL requested clarification of whether stakeholders would participate in the drafting of any CPUC proposal to the Legislature regarding the mandating of E9-1-1 requirements on MLTS/PBX owners. In response, the ALJ Division reviewed the issue and decided it was fine to open the legislation working group to stakeholder participation.

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[8] State Emergency Telephone Number Account -- the subscriber surcharge used to fund the 9-1-1 Network as administered by the California 9-1-1 Emergency Communications Office.

[9] The Revised Code of Washington (RCW 38.52.505) describes the role of the local fire protection officer in the implementation of Washington Administrative Code (WAC) Title 118 Chapter 118-68-050: Inspection for compliance with the adequacy of automatic location information displayed at the PSAP when 911 calls are made.

[10] NENA Technical Requirements Document on Model Legislation E9-1-1 for Multi-Line Telephone Systems, NENA 06-750, Version 2, 2009.

Formation of Technical Workgroups

In order to maintain the momentum of stakeholder interest and recommendations, on August 9 CD proposed eight technical workgroups that would address, study and report on the issues, topics and subject areas raised in the workshop. Parties were asked to review the list (shown below) and offer comments, revisions or alternative suggestions by September 3, 2010.

No party objected to the overall subject areas proposed by CD. Upon review of the comments and suggestions, staff clarified and slightly revised the scope and purpose of the workgroups, as shown below. Subject areas may be further refined as needed. Staff may meet initially with individual stakeholders to better understand technical issues and availability of relevant data, but workgroup meetings will be open and accessible to all interested parties. Parties are asked to begin planning their participation in workgroups of interest. Written statements outlining positions, suggestions and recommended solutions submitted prior to each meeting will assist staff in identifying areas of consensus and disagreement, and should result in a more effective and time-efficient effort.

CD plans to announce and schedule meetings for workgroups one through six during the last quarter on 2010 and first quarter of 2011. Stakeholders may be asked to provide a suitable meeting place, or volunteer for producing meeting minutes. Staff plans to hold at least one meeting in Sacramento and one meeting in Southern California to facilitate stakeholder participation. The Legislative workgroup will be the last workgroup to meet and will follow stakeholder review of CD's summary of the results of the first six technical workgroups, as shown in the following table.

CD's Proposed Technical Workgroups

WG	Subject Area	Proposed Purpose and Goals	Plan
1	9-1-1 database formats and data exchange processes	Review the benefits, costs and feasibility of upgrading current formats to conform to NENA version 4; Develop timetables for PSAP CPE replacement/refit and compare to the State's timetable for full implementation of NG9-1-1.	4th Qt, 2010
2	CPUC Webpage: Public Resources and Information	Develop the content of a CPUC webpage dedicated to MLTS E9-1-1 Information that identifies and addresses caller location issues, defines high risk MLTS environments, identifies solutions and links to solution providers, link to Guidelines and Best Practices for owners of PBX/MLTS/VoIP Enterprise Networks [Workgroup 6], link to Statewide Guidelines for testing 9-1-1 call routings [Workgroup 3], and links to other resources.	1st Qt, 2011
3	Testing 9-1-1 call routings	Statewide Guidelines and procedures for planning and testing 9-1-1 call routings from MLTS installations prior to going live: 1) criteria that identifies high risk MLT environments that requires coordination with county coordinators, 2) list of 9-1-1 county coordinators in each county, and 3) list of contact person in each PSAP for scheduling 9-1-1 call-routing testing.	4th Qt, 2010
4	Business Practices of Regulated Utilities and Local Service Providers related to provisioning multi-line access services	Improve the way LECs and other local service providers inform their multi-line customers about MLTS E9-1-1 issues, and facilitate customer access to services that provide solutions; Benefits of a "Standard Operating Procedure" (SOP) which provides written policy and instructions for customer service and sales support personnel; Duties of Incumbent LECs as carriers of last resort compared to CLECs and other local service providers.	1st Qt, 2011
5	Fire Safety Inspections	Outreach to State and local fire safety marshals to understand current processes, and examine the potential for expanding fire safety inspections for: 1) defining Emergency Response Location Zones, 2) testing 9-1-1 call routings from MLTS phones, and 3) enforcement, compliance and penalties for violations.	4th Qt, 2010
6	Guidelines for Businesses, Government agencies and other property owners for Ensuring E9-1-1 in PBX/MLTS and VoIP Enterprise Networks.	Guidelines and Best Practices for MLTS owners and installers for provisioning accurate caller location information for high risk MLTS environments. Information that identifies caller location issues and defines high risk MLTS environments; Identifies responsibility of each party, solutions and solution providers; Link to the CPUC Public Resources and Information webpage [Workgroup 2]; Link to Statewide Guidelines for testing 9-1-1 call routings [Workgroup 3]; Statement of exemption for small business; and Links to relevant California laws and regulations.	1st Qt, 2011
7	SETNA Reimbursement	Modifying disbursements from the State Emergency Telephone Number Account (SETNA) may require legislation; subject incorporated into WG 8.	
8	Proposal to the Legislature to address MLTS E9-1-1 issues	Evaluate the NENA Model Legislation as a template for a legislative solution to the issues/problems/recommendations identified in the other technical workgroups. Develop and recommend a plan for compliance based on experience in other states. Review the need for subsidizing PS/ALI and phone station caller ID transport costs through reimbursement from SETNA.	2nd Qt, 2011

Introduction

This rulemaking was opened to improve public safety access to emergency services from a workplace, public place, residential complex or other business location served by a multi-line telephone system (MLTS) such as a PBX. The public safety objective of the proceeding is to reduce the time needed to find an injured or distressed 9-1-1 caller, and minimize the exposure of police, fire and emergency medical responders to dangerous conditions.

Comments to the O.I.R. were filed by LECs, with D.R.A being the only non-service provider to file. It became evident that the major reason other stakeholder groups did not file comments was their unfamiliarity with the Commission's rulemaking procedures and regulatory processes. In order to ensure that the rulemaking considers the views of all the affected stakeholders, Staff initiated an outreach effort to identify and contact public safety entities, businesses, building and property owners and other representative stakeholders.

 Eleven representative parties agreed to attend the workshop and make presentations. These include statewide organizations representing California's PSAPs and 9-1-1 County Coordinators, North America's largest MLTS/PBX manufacturer, nationally known third party E9-1-1 solution providers, a CLEC providing hosted VoIP service, a California State University campus, and the California 9-1-1 Emergency Communications Office. In addition, California's two 9-1-1 Network and Database Management service providers and largest ILECs -- AT&T and Verizon -- made presentations. The other ILECs in the state were also present, and participated in the workshop. This included representatives from Frontier Communications, SureWest Telephone, Sierra Telephone, and the "Small LECs".

The CPUC Business & Community Outreach Office contacted six statewide property owner and manager associations and regional business councils, but these parties declined to participate in the workshop or proceeding. However, the 9-1-1 Office provided CD with copies of emails it received from individual business owners and telecommunication installers requesting guidance, information and assistance on MLTS E9-1-1 requirements. CD contacted a few of these parties to obtain their perspective and experiences, and requested the 9-1-1 Office to quote from these email requests and address the issues raised in its workshop presentation.

The Assigned Commissioner and Administrative Law Judge's Ruling and Scoping Memo dated June 16 set the scope and schedule for the proceeding, and provided the proposed topics and agenda for the first workshop scheduled for July 26 and 27, 2010. The Agenda explicitly recognized that the workshop would be primarily informational in nature in order to give additional stakeholders and interested parties the opportunity to provide new information and input on the issues raised by the proceeding.

CD emailed a public notice on July 12 providing additional workshop details and a draft agenda identifying topics, presenters and timelines. The agenda was structured around nine subject areas or topics as shown below -- the list includes the final list of presenters.

Number	MLTS E9-1-1 Workshop Topic/Subject	Presenter(s)*
Topic 1	Background, Definitions and Starting Points	CD Staff
Topic 2	PSAP and Public Safety experiences and needs for accurate caller location and call back information from high risk MLTS configurations.	CALNENA, 9-1-1 County Coordinator Task Force (CCTF)
Topic 3	Low-risk MLTS configurations and acceptable exemptions and alternatives.	CALNENA, 9-1-1 County Coordinator Task Force (CCTF)
Topic 4	Tools and services available for provisioning caller location information for use by connecting carriers, end users and third party E9-1-1 solution providers.	California's 9-1-1 Network Operators: AT&T California, Verizon California
Topic 5	Industry best practices regarding E9-1-1 capabilities of PBXs and Enterprise VoIP systems, and typical costs to the business owner of provisioning caller location information.	MLTS equipment manufacturer: AVAYA
Topic 6	LEC business practices for informing customers ordering multi-line service of the need to provision caller location information needed by PSAPs.	AT&T California, Verizon California, Creative Interconnect Communications (CIC)
Topic 7	Solutions and alternatives available to the customer for provisioning caller location information in service territories where ILECs do not offer PS/ALI service or ISDN transmission service.	Small LECs, Surewest, Frontier
Topic 8	Case histories of provisioning caller location information for MLTS and Enterprise installations within California by Third Party E9-1-1 Solution Providers.	911 ETC, RedSky, Telecommunications Systems (TCS)
Topic 9	Perspective and feedback on the need, feasibility and cost of provisioning caller location information by businesses, government agencies and other property owners.	Facey Medical Foundation, California State University Fullerton, California 9-1-1 Emergency Communications Office

* Includes written and oral statements and subsequent email clarifications

Workshop Presentations

Prior to the workshop, CD created a webpage on the Commission's website[11] with reference materials on the proceeding, workshop and links to the presentations. Due to the highly technical subject matter, CD recommended that workshop attendees review the OIR and appendices in preparation. The following summary identifies the major points of each presentation, gist of comments during the subsequent Q&A and discussion, and supplemental information provided by email. This summary is organized by workshop subject area and presenter. The original presentations and submissions are attached to this report.

Topic 1: Background, definitions and starting points

CD Regulatory Analyst Michael Aguilar commenced the workshop with a review of the workshop meeting goals and agenda followed by background information on FCC MLTS E9-1-1 proceedings. As the workshop moved through the agenda topics, CD prefaced the introduction of topics and presenters with the additional reference material shown below.

Workshop Goals and Objectives:

1) Identify the public safety need for accurate caller location information on 9-1-1 calls
2) Describe how public utilities and other service providers work with business customers in implementing best practices for provisioning caller location information needed for timely emergency response.
3) Identify the feasibility and cost to businesses and other property owners of provisioning caller location information needed by PSAPs and field responders.

FCC MLTS E9-1-1 proceedings

- In 1994, the Federal Communications Commission sought comment on ensuring the compatibility of PBXs and other dispersed MLTS with E9-1-1 services.[12] The FCC notice described the unique characteristics of PBXs that made it difficult to identify a 9-1-1 caller's TN and location.

- In 2002, the FCC sought to refresh the record through its *E911 Scope NPRM* [13] by reiterating its previous conclusion that the delivery of accurate location information and callback number is vital for a local emergency response to be effective and is in the public interest. The FCC had found that "callback and station location information is not automatically available today from behind MLTS and from behind an IP-based private network".

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[11] http://www.cpuc.ca.gov/PUC/Telco/MLTS+E-911+Workshop.htm

[12] Revision of the Commission's Rules to Ensure Compatibility with Enhanced 9-1-1 Emerging Calling Systems, CC Docket No. 94-102, 9 FCC Rcd. 6170 (1994)

[13] FNPRM, 17 FCC Rcd. 25576 (2002)

- In 2003, the FCC issued its Report and Order and Second Further Notice of Proposed Rulemaking[14], stating that the "FCC was concerned that the lack of effective implementation of MLTS E911 could be an unacceptable gap in the emergency call system, and could have a deleterious effect on our homeland security system." The FCC made a number of findings: it reviewed the obligations of carriers to transmit all 9-1-1 calls and "provide the trunking and interfaces capable of transferring location information received from MLTS"; it found a "variety of technologies and vendors exist currently that make E911 compliance in the MLTS context quite feasible"; and it concluded that "States are in a unique position to coordinate the disparate elements necessary for MLTS E911 implementation."

California's 9-1-1 Database Service Providers

- Pacific Bell (predecessor to AT&T California) and GTE (predecessor to Verizon California) designed, built and operate California's two separate legacy 9-1-1 networks and integrated database management systems (DMS), and wrote the 9-1-1 Service Order Requirements and Standards for connecting LECs. Accordingly, LECs are required to submit to the appropriate 9-1-1 DMS their subscriber's TN, address, class of service, and other critical information needed by PSAPs to evaluate 9-1-1 calls and direct emergency responders. Wireless, VoIP and other emerging technology service providers maintain separate database arrangements, but are required by FCC rules to route 9-1-1 calls to the legacy 9-1-1 network for delivery to the PSAP.

- E9-1-1 service is available throughout California, there are about 26 Million 9-1-1 records in the combined databases and 25 Million 9-1-1 calls were delivered in 2008. The State of California makes annual payments of $40Million for Database services and an additional $15Million provisioning the Wireline 9-1-1 Network[15].

- AT&T and Verizon are active on the national level and serve on NENA technical committees that have adopted new database formats. Newer formats such as NENA 4 allow for additional and expanded information about a 9-1-1 call from a PBX/MLTS provisioned with PS/ALI database information. NENA4 also utilizes XML formatting that may potentially reduce costs to PS/ALI customers/businesses and E9-1-1 service providers by permitting current industry standard automated data exchange processes, as described by NENA.[16]

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[14] 18 FCC Rcd 25340 (2003)

[15] 64 percent of the 9-1-1 calls in 2008 were wireless and their subscriber records are not in the database. Annual payments are based on average SETNA disbursements as shown in the California 9-1-1 Strategic Plan 2009.

[16] 'The NENA Data Technical Committee has established 4 standard data exchange formats for use by Service Providers and Data Base Management System Providers when exchanging E9-1-1 data base information. All 9-1-1 data exchange formats utilize ASCII characters. The NENA Data Technical Committee recommends the use of the most current format for data exchange, NENA Version 4 for PS/911 data exchange since this version provides identification of the Telephone Service Provider (Dialtone) and the source of the Automatic Location Identification or ALI record. Version 4 format is intended to bring the data exchange process in line with current technology, processing tools and methods utilizing XML, a "Tag Data" approach to information exchange. XML will allow for growth, flexibility, and use of industry standard programming techniques', NENA-06-003 "Private Switch (PS) E9-1-1 Database Standard", page 8.

Types of Multi-line Telephone Systems

- Hosted Service is a MLTS owned, operated and managed by a regulated carrier or other service provider. Most if not all ILECs offer a CENTREX type hosted service housed at a local switch.

- Premise based MLTS/PBXs are owned by a business, government entity or non-profit organization, and generally fall into three main types:
  - Traditional or TDM PBXs typically carry only voice calls and utilize a circuit-switched, multi-line transmission service such as PBX Trunk, T1 line or ISDN/PRI service for access to the PSTN.
  - VoIP/Enterprise PBXs digitize and transmit voice calls in data packets, and can utilize an Internet Protocol (IP), DSL or broadband connection provided by an ITSP, VoIP Service Provider (VSP), CLEC or LEC affiliate.
  - Hybrid PBXs transmit both voice and data and can utilize either circuit-switched digital service (ISDN PRI) or an IP/broadband connection, depending on the PBX adjunct device.

Fixed/Nomadic VoIP LAN and WAN PBX Networks

- End user phones are connected to VoIP/Enterprise and hybrid PBXs through a local area network (LAN) or wide are network (WAN). In these configurations, LANs typically are privately owned networks on the customer premises while WANs are generally public networks serving metropolitan or extended service areas. WANs can be used to connect remote offices to the central PBX host.

- It is important to note that the Interconnected VoIP service offered by the public utility or other telephony provider in these cases is a fixed VoIP service provisioned to the demarcation point where the utility transmission service connects with the host PBX. However, within the customer's network the VoIP service may be nomadic which permits end users to move their phone device to any available port or jack, connect to the LAN and get dial tone.

MLTS Equipment E9-1-1 Capabilities

- The Telecommunications Industry Association (TIA) addressed the "E9-1-1 call misdirection and response unit misdirection problems" of PBXs in a series of published standards beginning with the '1995 TIA/EIA-689 Standard: PBX and KTS Support of E9-1-1 Service'.
  - 'This standard is intended to guide the design of new MLTS equipment to help assure that 9-1-1 callers from phones connected to that equipment receive the full benefits of E9-1-1 calling.'
  - The standard specifically addressed dialing, routing, attendant notification, network interfaces, DID and non-DID database information, and installation instructions.

- In 2003, TIA issued the "Revised TIA-689A 'Telecommunications Multiline Terminal Systems: PBX and KTS Support of E9-1-1 Emergency Calling Service'".
  - 'The standard may be used in the design of MLTS that are installed in many businesses, hotels or campus environments. … helps emergency responders to determine the location of 911 calls connected to MLTS, as occurs with fixed single-line telephones that are typically found in a residence.'

PBX Owners are looking for guidelines and standards

- The California 9-1-1 Office provided CD with copies of representative emails it has received from PBX owners, installers and other service providers which revealed that many businesses and public agencies wish to provision accurate E9-1-1 caller location information, but experience difficulties getting information from service providers or locating resources on best practices.

- As a result of CD outreach, a health care provider was willing to provide written comments[17] on the issue as summarized below:
  - 'Facey Medical Foundation is a non-profit, multi-specialty, multi-site healthcare provider group with 150 physicians providing healthcare services to over 150000 residents of Los Angeles County.'
  - 'While implementing E-911 services with our PSTN providers to minimize the risk of an ambulance arriving at a location 10 miles from the emergency, I did a bit of research and found many states are now requiring that the correct location information gets sent to 911 call centers, sometimes even going down to the suite level.'
  - 'I would think that as [VoIP] technology becomes widespread that it would be beneficial for the public safety if CPUC were to establish the following: A) Similar regulations to other states requiring accurate station level location identification be sent to 911 systems; B) Public outreach communications such that information on e-911 services was easy to find; C) A working dialogue and cooperative mission with Telco providers that would help ensure that the telco providers customers needs are proactively addressed.'

Topic 2: PSAP and Public Safety experiences and needs for accurate caller location and call back information from high risk MLTS configurations

CALNENA and CCTF

CALNENA, the California chapter of the National Emergency Number Association (NENA) and the 9-1-1 County Coordinator Task Force (CCTF) presented on behalf of PSAPs and 9-1-1 County Coordinators. Lisa Hoffman, Deputy Director of the San Francisco Department of Emergency Management was the main speaker for CALNENA, and Ella Sotelo, 9-1-1 County Coordinator Los Angeles, represented the CCTF.

- CALNENA's membership includes staff from over 500 PSAPs, and commercial vendors providing 9-1-1 PSAP equipment and services. It also has two appointed members on the State 9-1-1 Advisory Board. The CCTF trains and mentors 9-1-1 county coordinators and serves on the OCIO Emerging Technologies Workgroup.

- Calls from a multi-line telephone system typically refer first responders to a billing address, and while technology is available for more specific location information, it is not widely used. This causes response delays and resource response to incorrect locations.

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[17] The Facey Medical Foundation written comments are attached to the workshop report.

- PSAPs reported serious problems with 9-1-1 calls originating from PBXs at large hospitals, public schools, large businesses, chain stores, local government installations, and assisted living facilities -- in all areas of California in both small towns and metropolitan areas.

- Representative serious problems were that 9-1-1 calls were misrouted to the wrong PSAP and/or the caller ID displayed to the PSAP was not the TN of the caller. Should the call be disconnected prematurely, the PSAP has no call back ability if needed. These problems lead to dispatching limited public safety resources to the wrong location and considerable disruption of the business' operations as field responders attempt to locate the caller.

- 9-1-1 call takers rely on the class of service (COS) information shown in the 9-1-1 database record. When PBX is shown as the COS, it leads the call taker to the logical conclusion that there may be an issue with the displayed address. In order to insure responders are correctly dispatched, the call taker drills down to the location field and asks further questions about the caller's location. Even when asked, some callers may not know or accurately describe their location in an extensive campus facility, or cannot verbally communicate it.

High Risk MLTS Environments

- PSAPs identified High Risk MLTS Environments and problems as:
  - Multiple or remote buildings and locations served by a central/host PBX with only one address and call-back number in the 9-1-1 database
  - Assisted living or a medical facility with a phone in each living unit or patient room, but with only the main address and front desk TN provisioned in the 9-1-1 database
  - No on-site notification that a 9-1-1 call was made, and therefore the 24/7 attendant or security cannot assist the PSAP during call-back to the main billing number
  - No live person attendant to answer a PSAP call-back to the main billing number
  - No testing of 9-1-1 call routing from a multiple location installation prior to implementation, resulting in misrouted calls and delayed emergency response
  - No public safety authority to require a PBX owner to provision E9-1-1 caller location information.

- No participant presented information or offered comments contrary to these findings.

Topic 3: Low-risk MLTS configurations and acceptable exemptions and alternatives

NENA Model Legislation on MLTS E9-1-1

- PSAPs stress that mandating E9-1-1 for MLTS is essential because in many cases, employees in the private and public sector do not even know that their location is not being accurately presented to the local 9-1-1 call taker. There are many examples where callers who were unable to speak or communicate, but were saved because of E9-1-1 capability.

- PSAPs recommend adoption of the NENA Model Legislation on MLTS E9-1-1 to address and correct MLTS E9-1-1 caller location problems from businesses, large facilities and shared tenant service providers.

- PSAPs pointed out that cell phones should not be viewed as offering a comprehensive alternative solution because 9-1-1 wireless location technology can not identify the floor location of a caller in a multi-story building, it can be distorted in high density neighborhoods and signals are often not received within earthquake hardened buildings.

- PSAPs did not identify problems with 9-1-1 calls from small businesses at a single location or from a Centrex customer.

- The NENA Model Legislation identified the following acceptable exemptions which may be viewed as a proxy for low risk MLTS environments :
  - A contiguous location on one floor of less than 7000 square feet
  - Key Telephone Systems (since they serve a small number of phone extensions)
  - On premise interception authorized by law and supported by training

Topic 4: Tools and services available for provisioning caller location information for use by connecting carriers, end users and third party E9-1-1 solution providers

California's 9-1-1 Network Service Providers

AT&T California and Verizon California offer tariffed PS/ALI service which provides access to the 9-1-1 database and permits PBX owners/managers to provision end-users' phone station locations through a web-based interface for transmitting caller location data records.

- **AT&T's** 9-1-1 Area Manager Paul-David de la Rosby explained that the ANI (caller's number) needed to route the 9-1-1 call, and ALI (the caller's location displayed to the PSAP) can be the responsibility of different providers depending on the provisioning and technology. For example, a Centrex caller's TN and address is created through the carrier's service order process and will show on the PSAP's display. Wireless and VoIP subscriber information is not maintained in the 9-1-1 database, but is linked to the database through the use of 'shell records' established by those carriers.
  - For PBX customers who do not subscribe to PS/ALI service, the main address and main telephone number of the customer would be displayed to the PSAP, not the caller's phone station information.
  - AT&T's PS/ALI service is offered at a one-time tariff rate of $147.24. Several attendees commented that AT&T's tariff rate is very low compared to PS/ALI tariff rates in other states.
  - For PS/ALI subscribers, there are no record storage charges since AT&T gets compensated by the State for maintaining the 9-1-1 database.
  - PS/ALI subscribers incur other costs including the purchasing of DID telephone numbers for PBX extensions, and the provisioning of circuits to deliver the DID ANI to the 9-1-1 network. PS/ALI customers also face resource costs associated with hiring a vendor or employee to maintain the PS/ALI database information.
  - AT&T customers provisioned with PRI ISDN service are subject to additional 'PRI Inform 911' charges to pass the ANI (Caller ID) for DID stations. Current published 'PRI

Inform 911' rates consist of a non-recurring charge (NRC) of $142.49, and monthly recurring charges of $140.00 for each PRI ISDN trunk.[18]
  - o AT&T recently introduced a user friendly "Web Gateway" that supports NENA data file format version 2.1 and 3.0, but reported that all its customers use version 2.1
  - o AT&T does not currently support XML file transfers of station information to the 9-1-1 database.

- **Verizon's** Regulatory Specialist Lorraine Kocen explained that it currently provisions PS/ALI as a contract service at a flat $2500 for a five year term, but plans to revise and reduce its tariff to reflect how it provisions its services[19]. This change will streamline the process and minimize the need for customer legal review of ICB contracts which might deter customers from subscribing.
  - o '911IM' is Verizon's customer web-based PS/ALI interface and can be used with all service platforms.
  - o Verizon described customer responsibilities and the process for establishing, submitting and updating PS/ALI 9-1-1 database records for PBX/MLTS end users' phone stations.
  - o Verizon does not charge extra for ISDN PRI connectivity to PSAPs for station number identification.

- The utilities reported that most PS/ALI customers utilize their existing PRI ISDN digital transmission service to deliver 9-1-1 calls to the central office without the need for dedicated circuits. MLTS owners who do not utilize digital multi-line transmission service would need to order CAMA analog trunks which go from the PBX to the selective router. The CAMA trunks are more expensive than PRI ISDN service due to the higher non-recurring charges plus mileage based monthly trunk rates.
  - o Several circuit or trunk types can be used with PS/ALI service including Supertrunks.

- PS/ALI service is available to any MLTS/PBX owner/manager in California including CLEC customers and customers in the service territories of the state's other ILECs. AT&T and Verizon explained that a customer would need to contact his or her local service provider to arrange the appropriate services that permit delivery of PBX phone station caller ID and location information to the PSAP.

Topic 5: Industry best practices regarding E9-1-1 capabilities of PBXs and Enterprise VoIP systems, and typical costs to the business owner of provisioning caller location information

AVAYA

Mark Fletcher, AVAYA's Product Manager for Emergency Service and Chairperson of NENA's MLTS Technical Subcommittee, provided a review of the main causes of E9-1-1 failures in MLTS,

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[18] PRI Inform 911 monthly rates were raised from $118.74 on July 2, 2010, AT&T California Guidebook, Part 17 - ISDN Services, Section 2 ISDN PRI, Second Revised Sheet 29.

[19] Verizon Advice Letter 12530 was filed with an effective date of 10/14/2010, following introduction of Verizon's Information Manager and the development of Verizon's internal software application.

technology advances, incorrect perceived roadblocks, and E9-1-1 capabilities and costs. AVAYA manufactures the NORTEL switches used by telecommunication utilities, and enterprise MLTS/PBXs used by businesses and government entities.

- 70% of PBXs are not E9-1-1 compliant. The main causes are a lack of public understanding and knowledge of the PBX caller location problem, and a lack of compliance with laws that may exist. Public education could solve the bulk of the problem, and legislation should consider fines and penalties in a compliance plan.
  - Provisioning accurate caller location can shave five minutes off field responder response times

- Industry trends have made MLTS E9-1-1 solutions more feasible:
  - PRI circuits are now more common and expensive CAMA trunks are no longer required
  - SIP Trunking is more available permitting the smallest enterprise VoIP system to send the caller ID needed to retrieve the phone station information
  - Third party MLTS E9-1-1 solutions are available for under $5000
  - MLTS upgrades include built-in 9-1-1 capabilities
  - The same technology found in PSAP equipment is built into PBXs to provide caller ID and on-site notification
  - PS/ALI service is very affordable in California
  - End users were part of the group that developed the NENA Model Legislation so that it doesn't represent a burden

- Costs are fairly static with the major cost being managing and maintaining the database of phone station locations. Emergency Response Locations Zone (ERLZ) solutions[20] offer an affordable solution. In a new building, the IT data group can implement zones fairly easily, but it is more difficult to implement in older facilities where there may be a need to reengineer the data network.
  - Fire alarm zones can provide a good start for identifying ERLZs since they have already been evaluated for HAZMAT, user density, location of machinery, exit routes, and other on-site conditions.
  - The only allowance should be for old PBXs that cannot deliver caller ID (ANI). However, this is very rare and AVAYA/Nortel has been building E9-1-1 capabilities into its PBXs for the last ten years.

Topic 6: LEC business practices for informing customers ordering multi-line service of the need to provision caller location information needed by PSAPs.

LEC presentations and statements on this topic differed significantly in approach and detail.

- **AT&T** Senior Sales Manager Thomas Perry explained that sales and/or provisioning teams may discuss disaster recovery plans with a customer which may include review of 9-1-1 emergency processes. For customers requesting help on E9-1-1 services, AT&T will assign its 9-1-1 Data Integrity Unit "design team" to assist.

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[20] See the OIR Appendix B for a more detailed description of Emergency Response Location Zones.

- **Verizon** Product Manager Nick Sannelli described increased customer concern about workplace safety, and that more customers were interested in this issue. PBX owners are not knowledgeable about 9-1-1 and have approached Verizon about this issue even when it wasn't the 9-1-1 service provider. Verizon admitted that there have been stumbling blocks and problems in identifying who internally to talk to. It is developing a PS/ALI customer service informational package to assist and make it easy for the customer, and it views third party solution providers as welcome additions to the process.

Creative Interconnect Communications (CIC)

CIC is a California CLEC offering hosted VoIP service and installations, and is in the process of a complete transformation from being a traditional circuit switched TDM service provider. CIC President Bill Wilde offered his experience in converting TDM PBX customers to hosted VoIP MLTS service.

- Most of its traditional TDM customers with more than one site were not interested in accurate E9-1-1 location data for remote sites even when "educated" by CIC. Many older PBXs did not support sending the ANI on a 9-1-1 call, and customers did not want the expense of a major PBX upgrade or replacement.

- The VoIP platform natively provides improved support for 9-1-1 for multi-location customers, and customer education is part of the sale and provisioning process. CIC's Hosted VoIP service updates the 9-1-1 database for each handset when there is more than one building or floor, based on information from the customer.

- Customers face many obstacles including financial and the lack of information, and there is a need for guidelines for the testing process (of 9-1-1 call routings).

- None of the decisions required to resolve the issues are under the control of the carrier.

Topic 7: Solutions and alternatives available to the customer for provisioning caller location information in service territories where ILECs do not offer PS/ALI service or ISDN transmission service

- AT&T and Verizon reiterated that PS/ALI service is available throughout California and can be ordered through the local service provider.

- **Surewest** Executive Director of External Relations Greg Gierczak stated that at service initiation when there is a customer with two locations, Surewest can provision two different billing addresses if the customer desires.

- **The Small LECs'** attorney Patrick Rosvall stated that the 'Small LECs' have very few MLTS installations in their service territories -- the few MLTS customers in their territories are mostly schools and hospitals. The Small LECs have observed that there is little demand from customers for PS/ALI service, as they are not aware of any requests for such a service from their few MLTS customers. The small LECs are concerned that the business community was

not represented at the workshop, and that the burden for addressing the problem should not be placed solely on the utilities.

- **Frontier** Regulatory Manager Charles Born subsequently provided a copy of an email from its enterprise account sales representative that identified four steps for a customer to establish multiline E9-1-1. Two of these steps included Frontier contacting NENA to get a NENA ID for its customer, and putting the customer in touch with AT&T for subscribing to PS/ALI service.

Topic 8: Case histories of provisioning caller location information for MLTS and Enterprise installations within California by Third Party E9-1-1 Solution Providers

Telecommunication Systems (TCS)

TCS is a nationwide network operator that provides back-office call delivery services for wireless operators, cable MSOs (operator of multiple cable television franchises) and VoIP Service Providers (VSP). According to its website, TCS currently delivers half of all wireless 9-1-1 and VoIP 9-1-1 calls in the United States. TCS operates as a VoIP Positioning Center (VPC) for VoIP calls providing applications and database services to its VSP clients. CD asked TCS Sr. Product Manager Firdaus Aryana to provide information on two subjects: 1) best practices on tracking and updating MLTS phone locations, and 2) attaining, matching and validating call location data for VoIP phone subscribers.

- TCS provided a brief explanation of MLTS PBX technology that revealed that PBXs are programmed to use voice resources in the most optimal manner possible by utilizing available circuits when delivering calls to the PSTN. As a result, many end-users do not realize that a 9-1-1 call from a PBX will not deliver the caller's actual location to the PSAP as occurs with 9-1-1 calls from a traditional residential landline or typical cell phone, unless the PBX owner takes proactive steps. Many PBXs owners are unaware of the issue, and if they are, have little incentive to correct the problem.

- VoIP 9-1-1 call routing is similar to wireless 9-1-1 call routing because there is no record in the traditional 9-1-1 database for the end-user's TN. VSPs use the services of a VPC to route 9-1-1 calls to the correct PSAP. VSPs establish pseudo or shell records in the 9-1-1 database that steer the PSAP ALI data query to the VPC database that has the 9-1-1 caller's call back number and location information. Instead of submitting records to the 9-1-1 Database, the VSP customer or the end user registers and updates the caller location information in the VPC database.

- In a VoIP Enterprise network, end-users have the ability to move phones freely and get dial tone at any available network access node. TCS identified the Location Information Server (LIS) as a best practice implementation that provides solutions for nomadic VoIP caller location problems since the LIS gives enterprises the ability to automate the collection, validation, storage and management of employee telephone location information.

- The LIS automates the matching of the end user's location to the local MSAG[21] to assure the VSP has a validated location for its customer in the event the end user makes a 9-1-1 call. The LIS solution permits the end-user to update his location without the intervention of the enterprise's telecom manager or staff, thus reducing the administrative burden on the business or property owner.

RedSky

RedSky is a nationally recognized advocate for and provider of third party MLTS E9-1-1 solutions. Based on its presentation, RedSky serves over 300 enterprises and government agencies and tracks over one million phones nationally. Nicholas Maier, SVP Marketing and Channels, provided an overview of its services, and presented two case studies of major installations for California enterprise clients.

- There is a wide range of MLTS E9-1-1 solutions from low-cost, do it yourself LEC subscriptions, to high value third party installations and services utilizing highly automated systems that provide sophisticated phone tracking and notification. MLTS E9-1-1 provides the benefit of reducing an enterprise risk profile, and many enterprises have adopted E9-1-1 without legislation. 16 states have implemented E9-1-1 regulations and the NENA model legislation is a great blueprint.

- RedSky identified four steps that MLTS owners/operators can take to solve the caller location problems faced by PSAPs:
  1. buy DIDs (direct inward dialing) TNs
  2. open a PS/ALI account for access to the E9-1-1 database
  3. load ALI records for the DIDs in the E9-1-1 database
  4. program the PBX to send out the DID when the 9-1-1 call is made

- RedSky described two basic approaches to implementing E9-1-1 solutions that are low cost with a one-time service initiation fee:
  1. The MLTS owner can open a PS/ALI account with the LEC and manage the E9-1-1 implementation and maintenance
  2. The MLTS owner can subscribe to a third party solution provider's hosted service (such as RedSky's *E911 Anywhere* service) and program the PBX to send all 9-1-1 calls to it. This option does not require the owner to open a PS/ALI account.

- RedSky's first case study involved the California State Automobile Association which was implementing a new VoIP phone system serving multiple sites in California and Arizona. CSAA opened a PS/ALI account, and RedSky installed its E9-1-1 software application with the following features:
  - Established a unique location for each floor in each building
  - Automatically records IP phones moves
  - The PBX out sends the correct location (ELIN) to the PSAP
  - Emergency responders are directed to the right building and floor

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[21] Master Street and Address Guide (MSAG) is a table administered by the 9-1-1 County Coordinator that assigns a routing code to each address range for routing 9-1-1 calls to the PSAP with jurisdiction for the caller's location.

- o Internal CSAA emergency responders are notified of a 9-1-1 call

- The second case study involved Fox Studios where the challenge involved the moving of phones around different sets in the studio. The RedSky solution integrated its E9-1-1 Manager software with the Studio's PBX which requires end users to log the new location of each phone to get dial tone. The result is:
  - o Fox changes the location of each phone in only one place -- the PBX
  - o RedSky's software 'reads the data four times daily and updates ALI records using a PS/ALI account
  - o The PBX sends out the TN of the phone to the PSAP and field responders are directed to the right set location
  - o On-site notification of a 9-1-1 call is provided by SMS or screen pop

- RedSky's website provides information resources on software and hardware E9-1-1 solutions, case histories of installations from small businesses to multi-state enterprise solutions, liability risk assessments, customer budgeting guidelines, and other background materials helpful to the business owner's evaluation and consideration.

911 ETC

911 ETC is a national professional services company that provides E9-1-1 solutions to owners of PBX and VoIP networks through its "Software as a Service" (SaaS) product. 911 ETC Operations Manager Theresa Stockton and Regional Sales Manager Kevin Kito offered four California case studies to demonstrate the wide range of client PBX network configurations, requirements and approaches to MLTS E9-1-1 implementation.

- 911 ETC can manage the project from start to finish -- performs the on-site phone location audits, recommends software and hardware solutions, does the implementation, and provides hosted database management for ongoing maintenance. It establishes and populates the PS/ALI accounts in each region, and provides the customer interface / loader application used to automate the translation of customer database information to the required NENA data file formats. It can also provide adjunct hardware attached to the PBX which can provide on-site notification through screen pop ups or SMS text messages.

- **CalOptima** is a county organized health insurer in Orange County, and is a CLEC customer with a single address with multiple floors. The insurer installed new PBX technology, and 911 ETC implemented the E9-1-1 solution in two weeks, using existing phone station records to assign DID numbers to phone stations on each floor.

- **City of West Sacramento** had 34 unique building addresses, and 911 ETC implemented an on-going plan for database maintenance utilizing a comma delineated employee database file. The city emails the file daily to 911 ETC where it is processed to capture changes and update PS/ALI accounts.

- **Qualcomm** had 42 unique addresses and multiple dial tone providers which required establishing different NENA IDs for each dial tone provider. The 911 ETC implementation auto assigns DID numbers to non-DID numbers, and utilizes the existing call accounting system for database updates. 911 ETC translates the call accounting codes into valid MSAG addresses for the updates.

- **The County of San Bernardino** was presented as an example of an on-going progressive implementation of a huge installation involving multiple LEC territories. 911 ETC emphasized that the customer doesn't need to have everything exactly ready to get started, and the County's first step was to audit its phone system. A single scheduled data feed of a comma delimited file of coded telephone location information is sent daily from the County to 911 ETC where changes from previous files are identified and coded telephone information is translated to pre-validated MSAG information.

- 911 ETC identified a significant cost issue with AT&T's 'PRI Inform 911' monthly charge of $140.00 per ISDN PRI circuit since San Bernardino County has over 200 ISDN PRI lines and Verizon does not charge the County for ISDN PRI pass through of the PBX 9-1-1 caller ID. 911 ETC subsequently revealed that Orange County faced a similar cost issue on the ISDN PRI trunks serving its 42 buildings. Staff contacted Orange County and learned that it reconfigured its network of PBXs to channel all 9-1-1 calls through a single ISDN PRI trunk in order to avoid AT&T's monthly 'PRI Inform 911' charges on each trunk.

Topic 9: Perspective and feedback on the need, feasibility and cost of provisioning caller location information by businesses, government agencies and other property owners

California State University Fullerton (CSUF)

CSUF University Police dispatcher Brian Barnes' presentation offered two perspectives on the issue: MLTS on a college campus and PBXs in the community.

- The first perspective described how three college campuses with on-site university police PSAPs handle landline 9-1-1 calls:
  - Cal State Fullerton: every campus phone is a DID phone line and campus Telephone Services subscribes to AT&T's PS/ALI service to update the 9-1-1 database anytime a phone location moves.
  - Cal State Long Beach: because of the mixture of DID and non-DID phone numbers, 9-1-1 calls are routed by the campus PBX to the university police without going to the PSTN. The university police queries a campus telephone database to determine the location of the 9-1-1 call.
  - Cal Poly Pomona: When someone dials 9-1-1, they are routed by the campus PBX to the university police without going to the PSTN. The location is provided by the caller ID information stored in the PBX. If someone dials 8 to get an outside line and then 9-1-1, the call goes to the 9-1-1 PSTN network and back to university police with just the campus main number and location information, requiring the dispatcher to question the caller for their correct location.

- The second perspective offered the experiences of Southern California Dispatchers Association members dealing with problem 9-1-1 calls from non-university PBXs:
  - Fountain Valley Police Department is concerned with 'what if' problems at schools and hospitals where the ALI shows only the primary address.

- o Fullerton Police Department experienced problems identifying caller locations from a private university, hospital and hotel where calls are routed through the main PBX and shows only the main number and address.
- o Huntington Beach Police Department reported a problem with a 9-1-1 caller requiring medical aid from a county facility that recently changed its phone system. The caller was calling from a facility in another city served by a single main PBX which delayed emergency response.
- o Placentia Police Department reported problems with a bank routing all 9-1-1 calls through a main PBX, with calls from outside the city being routed to its PSAP.

California 9-1-1 Emergency Communications Office (9-1-1 Office)

9-1-1 Office VoIP Deployment Coordinator Donna Pena presented information on 9-1-1 issues involving VoIP PBXs, based on its experience and role as the primary California contact to coordinate the deployment of VoIP E9-1-1 by VoIP Service Providers (VSP). CD asked the 9-1-1 Office to share information on the requests it gets from the public for information on MLTS E9-1-1 requirements, and on its work developing best practices through the FCC Communications Security, Reliability and Interoperability Council (CSRIC).

- VSPs typically work with a database provider known as a Voice Positioning Center (VPC), and have access to the 9-1-1 network via a CLEC acting as an Emergency Services Gateway (ESGW). VPCs are used to store and update registered user location information, and then provide the information to PSAPs when a 9-1-1 VoIP call is made.

- The 9-1-1 Office presented 13 examples of requests from schools, hospitals, network engineers, consultants, counties, medical providers, equipment suppliers, insurance companies, security consultants, solution providers, and VPCs requesting MLTS E9-1-1 guidelines, best practices, legal requirements, or regulations requiring accurate caller location. Its general response to these requests was that:
  - o California has no MLTS E9-1-1 legislation,
  - o it's up to the business/entity to determine their scope of requirements/liability,
  - o there is a need to accurately provision the address and locations, and
  - o its important to perform acceptance testing prior to sign off on a VoIP installation to prevent misroutes

- The 9-1-1 Office worked as a member of CSRIC Working Group (WG) 4A[22] -- Best Practices for Reliable 9-1-1 and E9-1-1. The objective of WG 4A was to investigate and identify currently available standards and best practices concerning the implementation of 9-1-1 and E9-1-1 for VoIP services, and identify gaps including challenges related to the implementation of such standards by VoIP providers within the E9-1-1 system.
  - o There were several issues/gaps identified by WG 4A, but one particularly relevant to this proceeding involved VSP campus testing following the conversion of a campus or enterprise MLTS system to VoIP. WG 4A recognized that address provisioning performed

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[22] NENA reported that the WG 4A Final Report was submitted to the CSRIC on June 15, and the report was adopted as submitted on October 7, 2010. As a public document, it is expected to be available at: http://www.fcc.gov/pshs/advisory/csric/

by installers can be inaccurate and result in misrouted E9-1-1 calls. This type of misrouting error caused by inadequate testing was identified by CALNENA as a representative problem and reported by the Siskiyou County 9-1-1 county coordinator following a VoIP installation at the local college.

- o WG4A recommended that VoIP service and equipment providers perform additional testing for large or higher risk environments. Accordingly, the recommended Best Practice requires the VPC to perform additional testing for VSP client environments that have a high user capacity.

- Finally, Ms. Pena recommended that the CPUC create a single reference point on its website with guidelines, educational materials, links to other resources, and a statement of benefits, to ensure that the end user has access to 9-1-1 with the accurate location provisioned and displaying at the PSAP. As Ms. Pena so eloquently put it, the bottom line really is "Where do you want the ambulance to go?"

Conclusions and Recommendations

It has been 16 years since the FCC opened CC Docket 94-102 to address the serious call delivery problems of 9-1-1 calls originating from PBXs. In 1995 the Telecommunication Industry Association issued its "689 Standard for PBX and KTS Support of E9-1-1", and Pacific Bell filed the first PS/ALI tariff with the CPUC. Illinois passed the nation's first PBX/MLTS E9-1-1 law in 1999[23], and 15 states have followed with similar requirements. Theses events and the workshop presentations confirm the findings of the FCC's 2003 Report and Order that utilities can provide the trunking and interfaces capable of transferring location information received from a PBX/MLTS, and that a variety of technologies and vendors exist that make MLTS E9-1-1 compliance quite feasible and affordable at all price points. Yet, California's PSAPs report serious PBX 9-1-1 call misdirection and response unit misdirection problems throughout the state. 9-1-1 calls from PBXs are misrouted and have to be transferred to the correct PSAP, 9-1-1 call takers are not provided with the accurate caller location information needed to direct field responders to the site of the emergency, scarce public safety resources are misallocated, and critical minutes are added to emergency response times with potentially tragic consequences.

The PSAPs' purpose in participating in this proceeding was to help the Commission understand the difficulties faced by a PSAP in identifying the actual location of a 9-1-1 caller, and to alert the Commission that inaccurate reporting of PBX/MLTS information to the PSAP is a major public safety concern that causes delayed response to emergency situations. PSAPs stressed that in many cases, employees in the private and public sector don't even know that their location is not being accurately presented to the local 9-1-1 call taker, and there are many examples where callers who were unable to speak or communicate were saved because of E9-1-1 capability that reported accurate caller location.

The Presenters offered many reasons to explain the widespread nature of the MLTS E9-1-1 problem. Many business owners and installers do not understand how 9-1-1 caller location delivery works, so they are unaware of the problem. Utilities have viewed PS/ALI and other MLTS E9-1-1 services as a 'demand product', and do not appear to proactively identify E9-1-1 issues and solutions when provisioning multi-line service. The presentations from third party vendors and the 9-1-1 Office revealed that many individual businesses and installers are aware that other states have MLTS E9-1-1 mandates, but have difficulty finding information on E9-1-1 guidelines, standards and solutions for their California installations.

Facey Medical Foundation's letter to the Commission as a PBX owner succinctly described these difficulties, and identified the benefits to public safety if the CPUC were to establish similar regulations to other states, public outreach communications to make it easier to find information on E9-1-1 services, and a working dialog and cooperative mission with 'telco' providers to help ensure that PBX/MLTS customers' needs are proactively addressed.

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[23] Please see the O.I.R, Appendix D for more detail on the current state legislation requiring MLTS E9-1-1.

To quote one service provider's presentation, 'Customer education is part of the sale and provisioning process'. Staff believes that utilities can do a better job of informing PBX customers of potential 9-1-1 call delivery problems with certain high risk MLTS installations. Not withstanding this duty, utilities can not solve these problems on their own since the final decision rests with the customer. In other states, PBX owners have chosen to ignore the problem even when there was a legal mandate. As a result of all these issues, NENA's MLTS Technical Subcommittee Chairman Mark Fletcher estimates that 70% of all PBXs are not provisioned for MLTS E9-1-1, and concludes that without a state law with strong compliance provisions, PBX owners have little incentive to correct the problem.

There was no disagreement expressed at the workshop with conclusions that carriers and other service providers can not compel the customer to provision phone station location information, and that a law is needed with teeth in it to require PBX owners to provision E9-1-1 where it is needed. While there appears to be a general preference among the participants for the legislative process, Staff also believes stakeholders can begin the work needed to address the problems and issues raised in the workshop, and prepare for the day when California joins the other states with a MLTS E9-1-1 legislative mandate.

Among the various action items discussed at the workshop, staff considers the following to offer reasonable and effective interim solutions with the promise of minimal regulatory delay:

- LEC and other service provider business practices should be improved to facilitate customer access to existing services that provide MLTS E9-1-1 solutions
- PSAPs and County Coordinators should develop statewide guidelines and points of contact for arranging the testing of call routing from high risk MLTS environments
- Public education and resources on MLTS E9-1-1 issues and solutions should be provided through the Commission and the California 9-1-1 Office.

As the PSAPs acknowledged, identifying the 9-1-1 caller's location is a challenge involving the individual, the PBX/MLTS owner, the local carrier/service provider, other third parties, and government agencies responsible for providing public safety. Assistance from the ALJ Division is available to help stakeholders reach a timely consensus on actions moving forward. California does not need to reinvent the wheel -- there is experience and multiple examples from within our state on how mid-sized and large businesses, non-profits and government entities provision MLTS E9-1-1. And laws in other states provide examples of what works and doesn't work for effective compliance.

There is no excuse for continuing non-action when the case for improving public safety was so clearly presented by California's 9-1-1 and public safety subject matter experts. The goal is simply to improve the public's access to E9-1-1 where we work, shop, relax and vacation; where our kids go to school and college; where we receive government services and medical care; and where many of our disabled and elderly citizens live.