

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
Inquiry Concerning 9-1-1 Access, Routing, and)	PS Docket No. 17-239
Location in Enterprise Communications Systems)	

COMMENTS OF WEST SAFETY SERVICES, INC.

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West Safety Services, Inc. (“West Safety”) (f/k/a Intrado Inc.)¹ respectfully submits these comments in response to the Commission’s Notice of Inquiry in the above-referenced proceeding.²

I. INTRODUCTION AND SUMMARY

West Safety has long supported federal regulation of enhanced 9-1-1 (E9-1-1) capabilities of Enterprise Communications Systems (ECS).³ As a provider of emergency communications services and infrastructure systems and industry-leading 9-1-1 solutions for ECS,⁴ West Safety strongly believes that the ECS industry is ripe for national ECS E9-1-1 rules. Since the Commission last examined this issue in 2012, only a handful of states have passed

¹ West Safety is a wholly-owned subsidiary of West Corporation, a global provider of technology-enabled communications and network services primarily to business customers. West Safety provides emergency communications services and infrastructure systems to public safety organizations and service providers, including wireless carriers, wireline competitive local exchange carriers (CLECs), cable telephony providers and Voice over the Internet Protocol (VoIP) providers.

² *Inquiry Concerning 9-1-1 Access, Routing, and Location in Enterprise Communications Systems*, PS Dkt. No. 17-239, Notice of Inquiry (rel. Sept. 26, 2017) (NOI).

³ West Safety notes the Commission’s shift in terminology in the NOI from Multi-Line Telephone Systems (MLTS) to ECS in order to capture the full range of legacy MLTS and emerging IP-based enterprise systems.

⁴ West Safety has made significant investments in E9-1-1 solutions for ECS through its September 2014 acquisition of 911 Enable and its December 2016 acquisition of 911 ETC. More information about West Safety’s enterprise E9-1-1 solutions is available at: <https://www.west.com/safety-services/enterprise-e9-1-1-solutions/>. With over 35 years in the industry and more than one thousand employees dedicated to emergency services, West Safety has witnessed firsthand the evolution of E9-1-1 for ECS.

statutes or implemented rules requiring ECS to provide E9-1-1, bringing the total to a mere twenty-three.⁵ Moreover, the existing state laws are inconsistent, limited in scope and ineffective due to lack of enforcement or broad exceptions to compliance.

The Commission's decision to defer to state action on ECS E9-1-1 has proven unsuccessful. The states have not adequately answered the Commission's call in 2003 to "act expeditiously in this area" by taking "appropriate steps to ensure MLTS E9-1-1 deployment in their jurisdictions."⁶ Many office and factory workers, students and faculty, hotel guests and military personnel remain needlessly at risk that a 9-1-1 call from an ECS will not directly connect to 9-1-1 without a dialing prefix, route to the correct Public Safety Answering Point (PSAP), or provide a PSAP with even remotely accurate location information. Examples in the record abound of tragedies resulting directly from ECS E9-1-1 deficiencies.⁷

West Safety handles E9-1-1 for thousands of enterprise locations across the United States and Canada. Today the ECS scenario of each organization is truly unique—time-division multiplexing (TDM)/VoIP hybrid systems, hosted private branch exchange (PBX), soft phones, on-premises voice gateways, remote workers, etc. Complex network designs and distributed workforces have created an especially unique challenge for the enterprise's management of E9-

⁵ *Public Safety and Homeland Security Bureau Seeks Comment on Multi-Line Telephone Systems Pursuant to Next Generation 9-1-1 Advancement Act of 2012*, Public Notice, 27 FCC Rcd 5329, 5330-31 (PSHSB 2012) (2012 ECS Public Notice).

⁶ *Revision of the Commission's Rules to Ensure Compatibility With Enhanced E9-1-1 Emergency Calling Systems*, Report and Order and Second Further Notice of Proposed Rulemaking, 18 FCC Rcd 25340, 25362-63 (2003) (E9-1-1 Scope Order).

⁷ See, e.g., "Man Found Dead in Office 10 Hours After 911 Phone Glitch Confuses Rescuers," Washington Post (2006), available at: <http://www.washingtonpost.com/wp-dyn/content/article/2006/04/20/AR2006042001923.html>; "Texas Woman's Father Makes Case for Direct-dial 911," USA Today, available at: <https://www.usatoday.com/story/news/nation/2014/08/28/karis-law-911-calls/14761225/> (Aug. 28, 2014); "911 Call Mishap Takes Another Man's Life, Family Says," Fox13 Salt Lake City (Feb. 11, 2014), available at: <http://fox13now.com/2014/02/11/911-call-mishap-takes-another-mans-life-family-says/>.

1-1, and have exacerbated the “unacceptable gap in the emergency call system” for ECS E9-1-1 forecasted by the Commission in 2003.⁸ Commission action is therefore necessary in order for there to be some uniform, benchmark level of protection and E9-1-1 capabilities for users of ECS.

Fortunately, technological and cost considerations for ECS E9-1-1 have shifted in favor of federal regulation. Enterprises are migrating rapidly to on-premises and hosted Internet Protocol (IP)-based ECS for VoIP and Unified Communications (UC) platforms to reduce voice and network costs and consolidate or eliminate internal infrastructure.⁹ All of these IP-based ECS systems and equipment are capable of supporting E9-1-1 with little or no additional cost, and reasonable upgrades and services are available to bring legacy, TDM-based ECS into E9-1-1 compliance. The cost of E9-1-1 solutions for IP-based ECS is nominal and E9-1-1 functionality can now be seamlessly integrated across a wide range of VoIP and UC platforms with minimal user effort and automated E9-1-1 location updates. Apart from the potential burden to be imposed on the shrinking (and one-day nonexistent) marketplace for legacy ECS, which can be addressed through a generous implementation schedule tied to the pace of migration to IP, cost and burden should no longer be valid reasons for delaying Commission action.

⁸ E9-1-1 Scope Order at 25385 ¶ 113.

⁹ Hosted UC solutions with access to the public switched telephone network (PSTN) are many times provided by interconnected VoIP providers or an incumbent local exchange carriers (ILECs) or CLEC affiliate. Appendix A of the NOI outlines the required E9-1-1 capabilities for each of these service types, including the obligation of interconnected VoIP providers to require their subscribers to provide a registered location. In some fully hosted UC configurations, the interconnected VoIP provider also acts as the hosted ECS operator for the enterprise owner under contract. In other hosted UC solutions, the service provider may host and operate ECS for the enterprise but its communications service does not constitute interconnected VoIP, such as an “outbound-only” or “one-way” VoIP service. *See Amending the Definition of Interconnected VoIP Service in Section 9.3 of the Commission’s Rules, Wireless E911 Location Accuracy Requirements, and E911 Requirements for IP-Enabled Service Providers*, Notice of Proposed Rulemaking, Third Report and Order, and Second Further Notice of Proposed Rulemaking, 26 FCC Rcd 10074, 10089 (2011).

West Safety also believes that the Commission has sufficient legal authority to propose E9-1-1 regulations for ECS under Sections 1, 4(i) and 255 of the Communications Act and the Twenty-First Century Communications and Video Accessibility Act of 2010 (CVAA).¹⁰ The Commission possesses significant, albeit not unfettered, Title I authority to regulate interstate networks and originating access to 9-1-1 services for purposes of promoting safety of life and property. The CVAA provides the Commission with express authority to implement recommendations by the Emergency Access Advisory Committee (EAAC), several of which are relevant to ECS E9-1-1, as well as any regulations necessary to ensure individuals with disabilities have access to an IP-enabled emergency network. The Commission can also promulgate ECS E9-1-1 rules pursuant to its ancillary authority.

The current record on ECS E9-1-1 demonstrates that the Commission is now best positioned to permanently close the glaring safety gap for ECS. Although the passage of Kari's Law by Congress would close a portion of the gap through mandatory direct 9-1-1 dialing and onsite notification, the current bills do not address routing or location information for ECS E9-1-1.¹¹ Voluntary best practices and standards, although important for ECS E9-1-1 implementation and configuration, are insufficient to ensure expeditious and full compliance by ECS participants. West Safety urges the Commission to proceed with a rulemaking for adoption of a nationwide rule ensuring ECS support of direct 9-1-1 access, onsite notification, appropriate routing and accurate and sufficiently precise location.

¹⁰ 47 U.S.C. §§ 151, 154(i), 255; Twenty-First Century Communications and Video Accessibility Act of 2010, Pub. L. No. 111-260, 124 Stat. 2751, 2764, § 106(g) (2010) (codified at 47 U.S.C. § 615c(g)).

¹¹ See Kari's Law Act of 2017, H.R. 582, 115th Cong. (2017); S. 123, 115th Cong. (same title).

II. DISCUSSION

A. Exclusive State Regulation of ECS E9-1-1 has Created an Ineffective Patchwork of Rules not Suitable for Modern ECS

Commission review of E9-1-1 capabilities for ECS dates back until at least 1994 when the Commission first sought comment on this issue.¹² Twenty-three years later, and fourteen years after the Commission concluded in the E9-1-1 Scope Order that states were best positioned to devise rules, the states still have not adequately addressed the ECS E9-1-1 problem.¹³

Twenty-three states have enacted some form of ECS E9-1-1 regulation, and the requirements among them are not comprehensive or consistent.¹⁴ Some state laws impose 9-1-1 location requirements only on residential ECS, while others impose location requirements on all ECS but do not mandate direct 9-1-1 dialing, routing/callback information (*i.e.* Automatic Number Identification (ANI) or Emergency Location Identification Number (ELIN)¹⁵) or onsite notification.¹⁶ Many state laws vary as to the size and type of Emergency Response Location (ERL)¹⁷ that must be passed with 9-1-1 calls, and some do not include location or ANI/ELIN

¹² *Revision of the Commission's Rules to Ensure Compatibility with Enhanced 9-1-1 Emergency Calling Systems*, CC Dkt. No. 94-102, Notice of Proposed Rulemaking, 9 FCC Rcd 6170 (1994).

¹³ E9-1-1 Scope Order, 18 FCC Rcd at 25363.

¹⁴ Appendix B to the NOI omits the MLTS law in Tennessee at Public Chapter No. 808, S.B. No. 2137 (2016).

¹⁵ An ELIN is a ten digit DID number purchased from the local exchange carrier (LEC), and is one way for organizations to provide specific location information to the PSAP for a 9-1-1 call. First, enterprise administrators assign an ELIN to each ERL; one ELIN can be used for many phones within an ERL, but each ERL requires at least one unique ELIN. This mapping of ELINs to ERLs must then be loaded into the regional ALI database. During a 9-1-1 call, the ELIN takes the place of the caller's telephone number as the ANI and is used to route the call to the appropriate PSAP. The PSAP uses the ELIN to query the ALI database and retrieve the caller's location (*i.e.* ERL). The PSAP can also use the ELIN to call back the extension directly (which requires a temporary mapping of the 9-1-1 caller's number to the ELIN), bypassing the PBX attendant or auto-attendant.

¹⁶ See KRS 64.752 (requiring dispersed private telephone systems for residential use to provide ALI/ALI with street address, apartment and floor); Fla. Stat. § 365.175 (requiring all PBX to provide station-level ALI but no routing/callback ANI, onsite notification or direct 9-1-1 dialing requirements).

¹⁷ An ERL is a specific geographic location to which a 9-1-1 emergency response team may be dispatched. For increased accuracy, to reduce response times, or to meet state E9-1-1 legislation, the PBX administrator may break

requirements at all.¹⁸ Other state laws exempt ECS from onsite notification if the configuration requires additional equipment or cost, one state delegates ECS regulation to municipalities and another fully excuses local units of government from compliance if it would require additional revenue expenditures.¹⁹ In West Safety's home state of Colorado, the ECS E9-1-1 law merely requires that ECS operators provide written information to their end-users disclosing the proper method to dial 9-1-1 (*e.g.*, dial "9" prefix then 9-1-1) and any system limitations if the ECS does not provide ANI or automatic location information (ALI).²⁰

Enforcement in the states with ECS E9-1-1 laws is also lacking, and only a few of the laws include compliance penalties. Moreover, there is a high probability that some of the remaining 27 states will never implement ECS E9-1-1 laws due to political pressure, state deregulation of IP-based services and the unsettled federal regulatory classification of VoIP services. Enterprises located exclusively in these states, which include major business and population centers like California and New York, remain free to implement ECS without E9-1-1 capabilities.

down an organization's campus or buildings into several different ERLs. This allows the organization to provide the PSAP with a 9-1-1 caller's precise location, rather than simply the organization's main billing address. For example, each building within a campus or floor/wing of a building may be considered its own ERL; within a given ERL there may be several phones or extensions. In some states, regulations require that organizations maintain ERLs of a specific size or identifiable area (*e.g.*, one ERL per work station, one ERL per 7,000 square feet or per floor).

¹⁸ Compare 50 ILCS 750/15.6(a) (requiring building address and one location identifier per 40,000 sq. ft. of workspace) with 560 CMR 4.04(2) (requiring street address and at least one ANI per 22,500 sq. ft. of workspace), 35 PCS 5311.16 (requiring ERL with, at a minimum, building and floor location of caller; exempting workspaces less than 7,000 sq. ft. on single level in single contiguous property) and RCW 80.36.560 (requiring ALI for each telephone where business contains area over 25,000 sq. ft. or business is on more than one floor or building); MD H.B. 1080 (2015) (codified at MD Code § 1-314) (requiring direct 9-1-1 dialing but no location or routing requirements); TN Public Chapter No. 808, S.B. No. 2137 (2016) (same).

¹⁹ See OK S.B. 1221 (2016) (codified at 63 O.S. § 2855.1) (requiring onsite notification provided configuration does not require hardware improvement); AS 29.35.134 (permitting municipalities to require E9-1-1 for ECS operators); 25 MRSA §2934 (exempting local government from any ECS E9-1-1 rules adopted by bureau if compliance would require additional expenditures from local revenues).

²⁰ C.R.S. § 29-11-106.

Inconsistent state legislation has led to confusion for several of West Safety's large enterprise customers with VoIP or UC platforms spread across branch locations in multiple states. Multi-state enterprises are forced to choose between investing in state-specific deployments guaranteeing compliance or universal configurations assuming the most stringent compliance standard for all of the common elements of the state ECS laws. Managing the complexity and variety of state ECS E9-1-1 laws is time consuming for enterprise organizations, and each new or dissimilar rule can create additional expense, system and hardware upgrades, configuration and maintenance requirements and re-negotiation with vendors. In short, state legislative efforts to regulate ECS E9-1-1 have resulted in a patchwork of ineffective regulation not suitable for modern ECS systems.

B. The State of the ECS Industry and Cost-Benefit Analysis on ECS E9-1-1

1. State of the ECS Industry

a. ECS Operators and Vendors

The number and type of ECS operators and equipment and service vendors varies widely among West Safety's customers. ECS operators include enterprise owners who purchase, operate and maintain their own on-premises telephone systems with PBX equipment and third-party providers of network and hosted services. On-premises PBX systems are employed by a wide variety of organizations, including schools, hospitals, multinational businesses, call centers, small and medium-sized enterprises. Third-party ECS operators include network-based offerings for legacy ECS and cloud PBX for VoIP.

Many equipment manufacturers, service vendors and communication platforms support ECS. The participants in ECS vary depending on the technology employed. ECS divides into three basic categories—TDM ECS (self-contained, proprietary, physical switches and wiring

with localized infrastructure), Hybrid ECS (combined TDM and IP extensions, reduced infrastructure, interoperability) and IP ECS (centralized infrastructure and servers, SIP capabilities with multimedia support, scalable). TDM-based ECS has been nearing end-of-life for a long time now, and the vast majority of enterprises have migrated, or will migrate soon, to pure IP-based ECS to support VoIP and UC systems, with an increasing trend toward cloud-based service offerings.²¹

b. Subscribers, Total Connections and Usage

The NOI cites the 2016 National 9-1-1 Progress Report issued by the National Highway Traffic Safety Administration (NHTSA), which contains data from 11 states on incoming 9-1-1 calls from ECS.²² To West Safety's knowledge, this report includes the most recent publicly available data on ECS 9-1-1 call volume. The report concludes that the majority of 9-1-1 calls are increasingly received from cell phones, the volume of ECS-originated calls exceeded 1,500,000 in 2016 in the 11 reporting states, and VoIP, ECS and text-to-9-1-1 are being used in increasing volumes.²³

West Safety's own records are consistent with the trends observed in the NHTSA 9-1-1 Progress Report. West Safety maintains call detail records (CDRs) for its enterprise customers

²¹ See Frost & Sullivan, *North American Hosted IP Telephony and UCaaS Market - Cloud Communications Solutions Evolve to Align with an API Economy* at 4, 52 (Nov. 2016), available from West Safety upon request and for purchase at: <https://www.frost.com/c/10107/sublib/display-report.do?id=K0DC-01-00-00-00> (concluding the "North American hosted IP telephony and unified communications-as-a-service (UCaaS) market is approaching mass adoption in small and medium-size business (SMB) segment and experiencing accelerated growth in the mid-market and large-enterprise segments"; estimating 21.7 million business users of hosted IP telephony and UCaaS in 2018); Frost & Sullivan, *Growth Opportunities in the VoIP Access and SIP Trunking Services Market - Innovative Providers Leverage Existing SIP Infrastructure for Advanced Voice Services*, at 19 (Jan. 2017), available from West Safety upon request and for purchase at: <http://www.frost.com/sublib/display-report.do?id=K0FC-01-00-00-00> (estimating 55.6 million business users with VoIP access and SIP trunking services in 2018).

²² NOI ¶ 19.

²³ NHTSA, 2016 National 9-1-1 Progress Report, at 2, 23 (2016), available at: <https://www.911.gov/pdf/National-911-Program-2016-ProfileDatabaseProgressReport-120516.pdf>.

subscribing to the West Safety enterprise routing service (ERS) for IP-based ECS, tracking the number of 9-1-1 calls placed at each organization.²⁴ The number of 9-1-1 calls from ECS varies by industry, with some industries like healthcare experiencing higher 9-1-1 call volumes than others. On average, West Safety estimates that its enterprise customers subscribing to ERS place approximately 425,000 calls to 9-1-1 per year.

c. *Broadband Access, Teleworking and Smart Buildings*

Wide-availability of affordable, high-speed broadband service will increase deployment of enterprise VoIP and UC platforms with on-premises or hosted ECS. This shift to IP-based ECS will continue to present challenges to E9-1-1 capabilities and public safety, as employees in and outside the office gain greater access to mobile broadband and Wi-Fi coverage.

Many of the enterprise customers of West Safety operate ECS or subscribe to hosted ECS services that provide call handling for multiple buildings and locations across city, county, and state lines. Workforces for these customers are often spread across several satellite offices, and many telecommute or work remotely with nomadic access. Market research shows that distributed workforces are common and will continue to grow in the near future.²⁵

²⁴ West Safety, Emergency Routing Service (ERS) Data Sheet, <http://safety.west.com/safety-services/enterprise/ERS.pdf> (describing West Safety's E9-1-1 call routing and location delivery solution for enterprise organizations); *see infra* Section II.B.1.c.i (describing call routing and location services for ECS E9-1-1).

²⁵ A 2016 Frost & Sullivan Report found that only 45% of an enterprise's workforce operates out of its headquarters, 18% of the workforce operates out of a satellite office, 17% are telecommuters, and 18% are offsite workers. *See* Frost & Sullivan, *The State of Communications and Collaboration in the Enterprise—How Companies are Embracing Digital Transformation*, at 43 (Aug. 2016), available from West Safety upon request and for purchase at: <https://store.frost.com/the-state-of-communications-and-collaboration-in-the-enterprise-how-companies-are-embracing-digital-transformation.html> (August 2016 Frost & Sullivan Report). A 2016 Dialpad & Lab42 Research Survey of 1,000 organizations revealed that 67% indicate that employees are allowed to work from home and 83% say their organization will increase their reliance on remote workers in the next three to five years. *See* Dialpad & Lab42 Research, *2016 Report on Business Communications in the Era of the Anywhere Worker* at § 02 (2016), available at: http://hello.dialpad.com/rs/838-ZLQ-213/images/2016_Trend_Survey_Report.pdf (2016 Dialpad Survey).

The impact on E9-1-1 services for remote workers calling 9-1-1 from ECS is significant because office phones can be located anywhere there is an Internet connection. Without proper E9-1-1 solutions in place, remote employees using a virtual private network (VPN) can make calls that appear to be originated from an employer's main office thousands of miles away from the caller's home office. Mistakes in routing or location provisioning for 9-1-1 calls can be fatal for teleworkers.

d. E9-1-1 Capabilities of ECS

- i. To what degree do ECS enable and support direct access to 9-1-1, routing to the correct PSAP and the provision of accurate location information about the end user?*²⁶

Direct access to 9-1-1 without a dialing prefix can typically be implemented by appropriate configurations to ECS of all types at little or no cost to the enterprise.

Routing to the correct PSAP normally requires that enterprises implement a call routing solution for their ECS. Legacy-based call routing solutions rely on local trunks and PSTN gateways. 9-1-1 calls from legacy ECS are routed over local trunks to the LEC's Central Office (CO) and then out to the local PSAP. Legacy-based solutions may not be able to support E9-1-1 routing for users accessing the ECS remotely, and they do not support centralized trunking.

IP-based ECS can be supported either natively through the ECS equipment with distributed trunks or by subscribing to a third-party VoIP Positioning Center (VPC) solution for E9-1-1 routing and centralized trunking. VPCs serve as the interface between the IP PBX and the 9-1-1 selective routers (SR) throughout North America. 9-1-1 calls are routed from the enterprise's IP PBX or UC system via centralized Session Initiation Protocol (SIP) or PSTN to the VPC server. The VPC retrieves the originating ELIN and routes the 9-1-1 call over its

²⁶ NOI ¶ 21.

network to the appropriate SR, which then delivers the call to the appropriate PSAP. VPC-based call routing solutions offer centralized trunking with nationwide support, so they are able to reduce network costs and complexity and provide 9-1-1 call routing capabilities for all enterprise users, including those working at home or elsewhere remotely.

Accurate location information for legacy ECS depends on third-party Private Switch ALI (PS-ALI) services. Generally, when a 9-1-1 call is made through a PBX, only the enterprise's main address is sent to the PSAP. By purchasing a PS-ALI account from a LEC or 9-1-1 database provider, enterprises can populate the regional ALI database with more specific location information, using ELINs and ERLs. When a phone's location changes, the regional ALI database must be revised with new location information, which takes time to update.²⁷

IP-based ECS equipment sometimes offers subnet-based IP tracking capabilities included as part of the standard feature set. Native ECS functionality for location is generally limited by the networking capability of the enterprise's subnet and the relationship of subnet to location within the enterprise. Often the native IP ECS equipment and subnet offers sufficient granularity to support acceptable location information, and enterprises generally spend inconsequential amounts on E9-1-1 location implementation. However, many of these enterprises choose to purchase third-party solutions from VPCs because the enterprise's network architecture is not deployed in accordance with the ECS manufacturer's requirements for phone location tracking (*e.g.*, they do not have geographically-discrete voice and data subnets), the enterprise has implemented a multi-vendor voice/UC/data network, or the enterprise has additional requirements otherwise not supported by the ECS manufacturer's capabilities.

²⁷ With traditional E9-1-1 service, ALI records are stored in regional ALI databases, and are administered by the LEC or a 9-1-1 database provider.

Third-party VPCs serve as a cost-effective replacement for PS-ALI for IP-based ECS. VPC solutions are available from multiple third-party vendors such as West Safety, Level 3, Comtech and Bandwidth.²⁸ A VPC solution is better suited to the nomadic nature of VoIP telephony than PS-ALI solutions. To ensure up-to-date ALI records for all VoIP users, regardless of location, VPCs maintain and provide access to their VPC ALI databases that host user location records which can be retrieved by the regional ALI databases.²⁹ These VPC ALI databases provide instantaneous ERL validation and provisioning, ensuring that the location data associated with a VoIP phone is correct and eliminating the lag time and complexity associated with managing records in different regional ALI databases. Unlike PS-ALI, a VPC solution is not limited to the use of ELINs to identify the location of the caller. While a VPC supports the use of ten-digit numbers, the locations of 9-1-1 callers may also be associated to a variety of other unique identifiers (media access control (MAC) address, IP address, extension, etc.) in the VPC ALI database.

Additionally, many vendor services are available to streamline E9-1-1 administration for enterprises using IP-based ECS. For example, West Safety offers an onsite appliance called an Emergency Gateway (EGW) that automatically tracks and assigns locations to IP hard phones, soft phones and wireless phones as they move on the corporate network (using layer 2, layer 3 or

²⁸ See ERS Data Sheet (describing West Safety's VPC service for enterprise).

²⁹ The term "VPC ALI database" is the generic identifier used by West Safety to refer to its dynamic ALI database of user location records to support VoIP and ECS E9-1-1. Other VPCs may name their databases by propriety names, but the basic functionality is uniform across all VPCs. Regional ALI databases are able to retrieve caller location from VPC ALI databases by using pre-provisioned pseudo ALI records. When these records are queried by the PSAP using an Enhanced Services Query Key (ESQK) (the pseudo-ANI (pANI) utilized for VoIP) provided with the 9-1-1 call, the regional ALI database steers the location request to the VPC associated to the ESQK. The VPC returns the callback number and location currently associated with the ESQK.

wireless LAN tracking).³⁰ This cost-effective solution also supports onsite 9-1-1 call notification, real-time location updates for remote workers directly from their IP phones and call delivery to VPCs using SIP or LECs using local trunking.

*ii. How precise should location information be when a caller uses ECS to attempt to reach 9-1-1?*³¹

West Safety believes that public safety should receive location information from an ECS 9-1-1 caller that is sufficient to dispatch first responders to a specific location in a life-saving timeframe. West Safety generally supports the location requirements set forth by the National Emergency Number Association (NENA) in its 2015 federal Model Legislation for ECS E9-1-1.³² Under the NENA proposal, each type of ECS (Business, Shared Residential, Temporary Residence) must provide station-level ERL and ELIN information unless (i) Business ECS is configured to provide at least one ERL for each floor of each property served, and within each floor at least one additional ERL for each whole 7,000 square feet of workspace beyond the first, (ii) Shared Residential ECS is configured to provide a unique ERL and ELIN for each living unit and common area served, and ERL that satisfies the Business rule for all other areas, and (iii) Temporary Residence ECS is configured to provide a unique ERL and ELIN for each temporary residential unit (*e.g.*, dorm/hotel room), and ERL that satisfies the Business rule for all other areas.³³

³⁰ West Safety, EGW Data Sheet, available at: http://safety.west.com/safety-services/enterprise/emergency_gateway.pdf.

³¹ NOI ¶ 22.

³² NENA, MLTS Model Legislation (2015) at 8-9 § 6, available at: http://c.ymcdn.com/sites/www.nena.org/resource/collection/C3D071C2-FACD-41CB-A09C-354888272EF8/MLTS_2015.pdf.

³³ *Id.*

Minimum ERL sizes should account for the unique ECS environment, with shared and temporary residence ECS requiring ERLs for each individual unit and business ECS requiring one validated ERL for each 7,000 square foot workspace within each floor. This standard provides enterprise organizations with adequate flexibility to manage floor segmentation in a manner properly tailored to account for diverse and evolving office environments (*e.g.*, cubicles, shared workspaces, call centers, etc.).

Ultimately, the end state for ECS location requirements should be no different from any other technology. The Commission has benchmarks in place that require wireless providers to achieve certain accuracy percentage targets for x/y location within 50 meters or dispatchable address for all wireless 9-1-1 calls over defined, phased-in timeframes.³⁴ A similar set of E9-1-1 location benchmarks could be developed for ECS over time, including a z-axis standard for vertical location (*e.g.*, floor). With the move to IP discovery, it is no longer a matter of tracking each individual cable. IP discovery is based off of subnets, switches and access points—all readily known by the organization and capable of provisioning within 50 feet of the 9-1-1 caller.

- iii. *In what ways, if any, are the E9-1-1 capabilities and limitations of IP-based systems or cloud-based systems different from those of legacy circuit-based systems?*³⁵

The E9-1-1 capabilities of IP-based ECS systems supported by SIP and Multiprotocol Label Switching (MPLS) are far more robust than those of legacy TDM-based ECS. IP voice services, unlike TDM services, allow callers to make 9-1-1 calls from anywhere in the ECS with the possibility of automated IP discovery of devices. SIP and MPLS improve utilization of network capacity, multi-site survivability, security, dynamic bandwidth allocation, network

³⁴ See 47 C.F.R. § 20.18(i).

³⁵ NOI ¶ 22.

stability, and call setup time. These protocols also provide a gateway for VoIP and UC systems to converge voice and data and support a variety of communications and multimedia applications including real-time text, which can potentially be utilized by ECS callers to access 9-1-1 and provide enhanced location and non-voice media to service-ready PSAPs.

Because IP phones can move around easily on the company network while keeping the same phone number or extension, location tracking can be challenging for IP-based ECS. Whereas traditional telephone numbers are static, the movement of IP phones forces the user to notify a network administrator, who in turn must contact the LEC or 9-1-1 database provider to update the phone's location in the regional ALI database. IP phones can also relocate to regions served by different ALI databases entirely. A VoIP service provider or enterprise would then need agreements with each LEC to update different regional ALI databases as phones move around the country.

The solution to this challenge is the third-party VPC service discussed above, which allows organizations to upload all of their phone records and ERLs to a VPC ALI database rather than to the regional ALI databases. A VPC solution can also provide instantaneous ERL validation and provisioning in a manner consistent with the NENA i2 architecture for the delivery of IP-based 9-1-1 calls to the PSAP.³⁶ When VPC solutions are paired with other vendor services like the EGW appliance from West Safety, enterprise organizations are able to easily track and manage IP phones, including soft phones and Wi-Fi enabled mobile devices such as tablets and LAN handsets, move/add/change events such as port and jack changes, Wi-Fi roaming within an office, and remote employees using VPNs.

³⁶ *NENA Interim VoIP Architecture for Enhanced 9-1-1 Services (i2)* at 21-22, 82-99 (v. 2 Aug. 11, 2010), available at: http://www.nena.org/?page=Interim_VoIP_i2 (i2 Architecture).

- iv. *Are newly deployed systems typically using extensions or direct-dial (10-digit) phone numbers?*³⁷

Among West Safety's customers, newly deployed systems are typically using direct-dial (10 digit) phone numbers, which allow for precise callback and location data; extensions have become the exception.

- v. *How do VoIP-based ECS differ in terms of technology from carrier or over-the-top (OTT) interconnected voice services?*³⁸

There essentially is little difference in technology for VoIP ECS from carrier or OTT voice services for purposes of ECS E9-1-1. Carrier or OTT are broad terms for IP voice providers. Both the carrier and OTT provider of VoIP utilize broadband to deliver voice services to the end user. VoIP ECS supported by carrier or OTT services is basically a private network stood up to meet the communications requirements for the enterprise end-user. For carrier and OTT VoIP services alike, the difficulty of securing and maintaining E9-1-1 location identity of the voice endpoint is one of two major requirements. The other is proper routing of the emergency call to the correct geographic PSAP. A third-party VPC solution addresses both of these requirements on behalf of carrier and OTT VoIP for ECS using the same basic functionality and technology discussed above.

- vi. *Are there any technical barriers that would need to be addressed to enable ECS to provide E9-1-1 service, or more reliable or accurate E9-1-1 service, to all end users?*³⁹

No technical barriers exist that inhibit IP-based ECS from providing accurate and reliable E9-1-1 services to its voice end-users. Mapping of locations, initial discovery of location (subnet

³⁷ NOI ¶ 22.

³⁸ *Id.*

³⁹ *Id.*

or switch port/jack), and maintenance of nomadic or mobile voice endpoints is feasible with “discovery” either achieved by inherent PBX capabilities or by utilizing a third-party application/platform. Routing of calls based on voice end-user location matched to the correct geographically-situated PSAP is achieved via local trunks or a third-party VPC. All users of IP-based ECS can be protected with accurate and reliable E9-1-1 service provided by current technologies, including remote stationary/nomadic end-users.

- vii. *To what extent are ECS configured to route calls to an external emergency answering point but also to notify an onsite emergency contact?*⁴⁰

Many of West Safety’s enterprise customers configure their ECS to route 9-1-1 calls to the local PSAP and also provide notification to an onsite emergency contact. This configuration is most common when the organization has a security team or an established front desk. The advantages for an organization with onsite notification are numerous; most notable is situational awareness for onsite personnel anytime 9-1-1 is dialed from within the enterprise. Data delivery for onsite notification can be configured to include name, callback number, precise station-level ERL, and links to enhanced data such as detailed floor plans and emergency contacts. Onsite notification functionality is not always available natively in the ECS equipment and often requires a third-party application such as West Safety’s ERS and EGW.

- viii. *We seek information on alternative 9-1-1 call handling and fallback mechanisms in use or available for ECS and the practices that apply for remote call centers.*⁴¹

As noted in footnote 44 of the NOI, West Safety operates an Emergency Call Relay Center (ECRC) that offers VoIP emergency routing services for unprovisioned and failover 9-1-1

⁴⁰ NOI ¶ 23.

⁴¹ NOI ¶¶ 24-25.

calls. A very small portion of 9-1-1 calls from ECS fail over to the ECRC, and ECS calls account for a small portion of the ECRC's total call volume. Most of the ECS calls that fail over to the ECRC source from lapses in location provisioning by the enterprise organization.

The ECRC is a tertiary failover path when the emergency call cannot be delivered by either the primary or secondary call path. This could occur when an address is not provisioned or when a network irregularity occurs. The ECRC's procedure is to confirm the caller's address in all situations, consistent with PSAP protocols. The ECRC is located in Longmont, Colorado and is staffed 24/7 by APCO Certificated Public Safety Telecommunicators⁴² that have a minimum of two years' experience in emergency call handling at a PSAP.

ECRC telecommunicators orally confirm the caller's location and perform a warm transfer⁴³ for the caller, using West Safety's routing databases and the SR network, to the appropriate PSAP. The data in West Safety's routing database is obtained from PSAPs and proactively reviewed and updated on a regular basis. In the rare situation when a call is transferred and the PSAP indicates that the address is not within their jurisdiction, West Safety transfers the call to the correct PSAP and then researches and corrects the database discrepancy.

Staffing levels in the ECRC are modeled after historical call volume (by day of week and time of day) as well as customer forecasts with the objective of meeting the NENA best practice of average speed to answer 90% of all calls within 10 seconds. Projections for staffing are continuously updated with new call data and customer forecasts.

⁴² APCO International, Public Safety Telecommunicator (PST) 7th Edition Training Course, available at: <https://www.apcointl.org/training-and-certification/disciplines/public-safety-telecommunicator-pst/public-safety-telecommunicator.html> (requires training and passing of exam for new APCO PST certification and current PSTs must provide proof every two years of 48 hours of Continuing Dispatch Education (CDE)).

⁴³ A warm transfer means the telecommunicator stays on the call until he/she is able to orally confirm that the call has been connected to the correct PSAP.

If the ECRC telecommunicators are fully busy, the call will continue to ring until the next telecommunicator is available. Calls are answered by ECRC telecommunicators in the order they are received. Allowing calls to continue ringing rather than using a pre-recorded message after a certain amount of time avoids the common result of a caller hanging up and losing his or her place in the queue after reaching the recording.

- ix. *Do cloud-based VoIP providers provide location information for individual stations in the ECS and, if not, are they capable of doing so?*⁴⁴

The same discovery technology used for IP phones today can be used for cloud-based VoIP providers. Most cloud-based VoIP providers are able to provide locations for individual stations of the ECS. Granular location detail such as individual stations, floor or building is usually provided by the enterprise owner or system administrator. In the case of remote stations such as teleworkers, the location can be registered by the administrator or the end user. Cloud-based VoIP providers initially provide location information in the form of the billing address for each station. It is not feasible for a cloud-based VoIP provider to automatically register the location of each station because this requires knowledge of the location of stations within the enterprise. However, the enterprise purchaser of cloud-based ECS services can easily administer, maintain and update tracking of IP phones and remote users with third-party VPC services and on-premises appliances like the West Safety EGW.

e. Standards

- i. *We also seek comment on current accepted industry standards for ECS E9-1-1 delivery. The NENA Model Legislation suggests that standards work is needed, particularly for small ECS. We seek comment on this observation as it pertains to both legacy and IP-based ECS. Are there*

⁴⁴ NOI ¶ 26.

*other areas where industry standards are still in development or areas where standards development has not been initiated?*⁴⁵

Further standards work is not required before ECS manufacturers, service providers and operators can implement ECS E9-1-1 capabilities.⁴⁶ Wireless emergency services have been defined to support wireless Phase II using standards provided by the Alliance for Telecommunications Industry Solutions (ATIS) and NENA. VoIP telephony emergency services were defined in NENA's i2 Architecture, and vendors implemented a similar solution.⁴⁷ There are no recent or proposed standards for ECS as they relate to interconnecting to E9-1-1. The ability to connect to SRs via Centralized Automated Message Accounting (CAMA) or Primary Rate Interface (PRI) is well defined. Additionally, the ability to provision Direct Inward Dialing (DID) numbers in the ALI database and the functionality of the PS-ALI is well documented. There are also standards for interconnecting ECS to NG9-1-1.

*ii. How do ECS standards or their practical implementation differ from those used for VoIP systems?*⁴⁸

VoIP emergency services follow the concepts defined in NENA's i2 standard.⁴⁹ Generally, the VoIP customer's address is provisioned in the VPC. During call time, the VoIP network creates an ESQK that may be used to associate the caller's location. The ESQK is forwarded to the SR in the call setup signaling, which then forwards it to the PSAP. The PSAP then queries the regional ALI database with the ESQK, and the ALI database forwards the query

⁴⁵ NOI ¶ 28.

⁴⁶ 2012 ECS Public Notice, Comments of NENA at 15-16 (filed July 5, 2012) (NENA 2012 Comments).

⁴⁷ i2 Architecture at 15-22, 82-99.

⁴⁸ NOI ¶ 28.

⁴⁹ i2 Architecture at 21-22.

to the VPC associated with the VoIP provider. The resulting location information is then returned to the PSAP.⁵⁰

There is no additional standard to implement a similar i2 solution by an ECS. Typically the ECS caller's location is provisioned in the ALI database either directly by provisioning the DID number with the caller's address or using a PS-ALI capability to upload the caller's location into the ALI database. NENA's Model Legislation also defines the concept of ERL and ELIN. Geographic areas within the enterprise are divided into response areas and assigned ERLs. The ELIN is passed to the PSAP and used to query the ALI database for retrieval of the caller's ERL.

- iii. *We seek information on any testing procedures ECS operators use to test 9-1-1 connectivity when they add new telephone numbers to existing services.*⁵¹

West Safety provides recommended standard testing procedures to its enterprise customers to test 9-1-1 connectivity during implementation. Accepted testing procedures vary by PSAP. Customers are advised to check with their local PSAP before attempting any test calls.

- iv. *What role, if any, do state or local fire codes play in annual testing of ECS?*⁵²

West Safety is aware of some counties that include testing of ECS for 9-1-1 in their local fire codes/audit checklist, though it appears to be a small percentage that follow this approach.

f. NG9-1-1 Capabilities of ECS

Current legacy and IP-based ECS have the capability to deliver 9-1-1 calls with all the required information such as location and callback number to ESInets or NG9-1-1-enabled

⁵⁰ i2 Architecture at 21-22, 82-91.

⁵¹ *Id.*

⁵² *Id.*

PSAPs. The NG9-1-1 network architecture allows for the integration of legacy systems and networks using Legacy Network Gateways (LNG) at the edge of an ESInet. The deployment of LNGs is performed by carriers and service providers and there are no cost or operational impacts to legacy and IP-based ECS.

Incorporating NG9-1-1 elements into ECS presents significant advantages over the legacy concepts of E9-1-1 (*i.e.* CAMA or PRI to the SR and PS-ALI to provision the caller's location). NENA's STA-010.2 (colloquially called i3) is currently published and NENA is working on version 3.⁵³ The i3 standard defines an "i3 call interface" that provides guidelines on how Originating Service Provider (OSP) networks interconnect to ESInets. While not specifically mentioning ECS/PBX, it is expected that they can interconnect to an ESInet in the same manner as any other OSP. That is, the ECS could interconnect via IP using SIP and pass the caller's call-back number and location either by value with the call (LbyV) or provide a location reference (URI) that would allow the emergency services network to query for location (Location by Reference [LbyR]).

The SIP Forum has published SIPconnect 2.0, which supports NG9-1-1 Emergency Services.⁵⁴ This allows the ECS to acquire the caller's location (not standardized) and provide it, along with the caller's callback number, to the NG9-1-1 Emergency Services Network either by value (LbyV) or by reference (LbyR). The SIPconnect 2.0 specification requires minor additional work in order to interwork with the NENA i3 standard.

⁵³ *Detailed Functional and Interface Standards for the NENA i3 Solution* (v. 2 Sept. 10, 2016), available at: https://www.nena.org/?page=i3_Stage3.

⁵⁴ SIPconnect 2.0 Technical Recommendation at 25 § 13 (v. 18 2016), available at: <https://www.sipforum.org/download/sipconnect-technical-recommendation-version-2-0/?wpdmdl=2818>.

If a 9-1-1 jurisdiction transitions to NG9-1-1 before the ECS is ready, the ECS may connect to the LNG, and the LNG would be expected to provide a PS-ALI like function. When the ECS incorporates the SIPconnect 2.0 capabilities, it may interconnect with the NG9-1-1 ESInet using native SIP. The ECS cannot transition to SIPconnect 2.0 until the associated emergency services network has transitioned to NG9-1-1.

g. Indoor Location Accuracy

In basic terms, the National Emergency Address Database (NEAD), as defined in ATIS-0700028, is a national database containing the physical dispatchable locations of Wi-Fi Access Points (Wi-Fi AP) and Bluetooth Low energy (BLE) beacons. Mobile devices using IP Multimedia Subsystem (IMS)/Long Term Evolution (LTE) architecture report the Wi-Fi APs and BLE beacons that are visible and the Commercial Mobile Radio Service (CMRS) network determines the nearest AP/Beacon and uses the NEAD to determine a dispatchable location (*e.g.*, address).

ECS could support a location system similar to the NEAD to collect and maintain data for locating mobile Wi-Fi devices connected to the enterprise organization's Wi-Fi or wired network. This solution could either utilize network location of the devices by relying on ECS infrastructure without device assistance, or device assisted location where the device provides Wi-Fi/BLE/GPS data to the ECS to help locate itself. The latter configuration presents significant potential benefits to remote ECS users, who would gain the same value in querying a NEAD-like database for ECS to locate an off-network device or voice application that a CMRS carrier would gain in querying the NEAD to locate a mobile phone.

In addition, the data that the enterprise organization collects to locate their mobile Wi-Fi devices, such as Wi-Fi AP MAC address and dispatchable location, could be provisioned to the

NEAD infrastructure. This data would be very useful to help locate CMRS devices that are physically located within the enterprise and are used by the caller to dial 9-1-1. Currently, the NEAD is technically designed to be utilized by an IMS/LTE network infrastructure. Standards are underway within ATIS to support a secure and appropriate interface between the ECS and the NEAD infrastructure to allow the combined querying of NEAD data and the provisioning of enterprise Wi-Fi and BLE data into the NEAD/National Emergency Address Manager (NEAM).

2. Cost-Benefit Analysis for ECS E9-1-1 Rules

a. Costs

The cost of providing E9-1-1 for ECS typically falls to the enterprise. As discussed above in Section II.B.1.c.i, legacy ECS can normally support 9-1-1 direct access with appropriate configurations to the ECS at minimal to no expense. E9-1-1 routing and location capabilities for legacy ECS requires the enterprise organization invest in the acquisition and maintenance of local trunks and gateways, services to maintain the LEC's PS-ALI database, and internal labor costs associated with the management of 9-1-1 service. West Safety believes these costs are reasonable considering the risk to public safety presented by noncompliant legacy ECS.

All IP-based ECS can support direct access to 9-1-1 with appropriate configuration at minimal to no expense. E9-1-1 routing and location services are available either natively through the IP ECS or by reliance on low cost, third-party VPC solutions, which eliminate the need for local trunks, 9-1-1 gateways and PS-ALI accounts for each location in multisite deployments. The 2010 MLTS workshop report of the California Public Utilities Commission (CPUC) concluded that such third-party ECS E9-1-1 solutions "are going down in cost and are available for under \$5,000" with "[s]mall business solutions . . . as low as \$1,250 for a one-time

implementation fee and \$65 to \$100 per month in recurring fees.”⁵⁵ This cost data is consistent with West Safety’s experience as the leading service vendor of E9-1-1 solutions for IP-based ECS.

In the states that have ECS E9-1-1 rules, West Safety has found no evidence among its ECS customer base that would suggest any cost for compliance has had an adverse effect on the purchase and implementation of new ECS. Pricing for VPC services varies based on the number of ECS users. VPC solutions for medium-size businesses can be deployed with onsite notification, appropriate routing and ERL provisioning using a VPC ALI database for setup fees starting at \$2,000 and a monthly user fee starting at less than \$1.00 per user.⁵⁶ The VPC cost for enterprise is nominal compared to the average annual spend on information technology (IT) per employee of \$6,820 for the healthcare industry and \$29,424 for the insurance industry according to a 2017 Gartner report.⁵⁷ Assuming a VPC monthly service charge of \$1.00 per user, E9-1-1 for IP-based ECS represents an approximate \$12.00 annual expense per user, or .17% of the IT budget for the average healthcare enterprise and .04% of the IT budget of the average insurance enterprise.⁵⁸

b. Benefits and Consumer Expectations

⁵⁵ CPUC, Communications Division, 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 at 7 (Oct. 2010), available at http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Communications_-_Telecommunications_and_Broadband/Final_MLTS_E9-1-1_Workshop_Report.pdf (CPUC MLTS Report).

⁵⁶ IP-based ECS can support direct access to 9-1-1 with appropriate configuration by the enterprise at minimal to no expense. See *supra* Section II.B.1.c.i.

⁵⁷ Gartner ITBudget: Enterprise Comparison Tool, 2017 Sample ITBudget Report at 4, available at: http://www.gartner.com/downloads/public/explore/metricsAndTools/ITBudget_Sample_2012.pdf.

⁵⁸ West Safety does not have access to the full 2017 Gartner report on average IT spend per employee in 2016 for all industries. However, 2012 Gartner data is available publicly showing a range of IT spend per user of \$4,454 (construction, materials, natural resources) to \$28,441 (insurance) across 22 industries surveyed. See 2013 Gartner IT Key Metrics Data at 9, available at: <https://www.slideshare.net/vashistvishal/gartner-it-enterprise-report2013>.

Public safety stands to benefit greatly from federal ECS E9-1-1 rules. Although the proliferation of VoIP and UC solutions has significantly reduced voice costs for enterprise organizations, it also has added considerable strain to emergency response. Dispersed IP-based voice applications serving virtual and nomadic workforces have amplified the risk associated with incorrect routing or inaccurate location information. A simple mistake in UC configuration can lead to a call being routed to centralized ECS equipment located in a main office several states away from the caller, and incorrect, static location may lead responders to a building miles away from a virtual employee calling 9-1-1 over a soft phone through a VPN. These mistakes delay or entirely thwart response and, consequently, unnecessarily endanger or cost lives.

Public safety agencies throughout the United States strive to have quick and efficient emergency response times based on the priority of the call requesting emergency response. Many agencies establish a five minute response time for high-priority calls in order to minimize risk to lives and property. West Safety is not aware of any specific industry data measuring the speed at which emergency response can reach a 9-1-1 caller from ECS. Accurate and sufficiently detailed E9-1-1 information undoubtedly assists 9-1-1 call takers with response by accelerating validation of location information obtained from the caller and by providing enhanced location information when the caller is unable to communicate or does not know where he/she is calling from. Additionally, accurate location from ECS E9-1-1 can include customized data about the facility, which aids and accelerates response by first responders, conserving their finite resources and minimizing exposure to dangerous conditions.

The 2010 CPUC MLTS Report includes an estimate from Avaya that 70% of MLTS are not provisioned to display accurate caller location information to the PSAP.⁵⁹ The CPUC also

⁵⁹ CPUC MLTS Report at 9.

observed in 2010 that “only 350 of California's 1.3 million businesses, governmental entities and nonprofits have provided PS/ALI records to the AT&T California E9-1-1 database, leaving most MLTS users without the E9-1-1 protections.”⁶⁰ Deficient E9-1-1 for ECS causes an array of problems for PSAPs and first responders. The California Chapter of the National Emergency Number Association (CalNENA) relayed some of these issues reported by PSAPs and 9-1-1 county coordinators in response to the CPUC’s inquiry in 2010:

- San Francisco. Someone called 9-1-1 from a convalescent home in Alameda County and that call was routed to SFPD. The PBX host listed an address in SF, so it came into our office on 9-1-1. After some minutes, the dispatcher determined it was actually in Union City and transferred the call. It did result in a response delay.
- Palo Alto. A chain store was robbed and someone was shot. The 9-1-1 caller could not speak on the phone. The VoIP system for the entire chain of stores showed the generic address for the headquarters and the call was routed to Sunnyvale PD. It took quite a while to locate the store and respond. The city asked the chain to correct the problem, but as there is no legal mandate for them to do so, we cannot force them.
- Kings County. We recently had a call from a school for the disabled. The primary school is located within the city limits. That call was received by the city. City sent fire/EMS and found that it was in the county at a satellite school that the PSAPs didn’t even know about. Response was delayed and took even longer. The response was significantly delayed.
- Los Angeles County. We encounter most of our PBX problems with large hospitals in our city, public schools, large businesses and City facilities. The callback number usually displays a main desk or switchboard number. We typically get someone who doesn’t have a clue that a 9-1-1 call was made. That’s if we actually reach a live person, many times it’s just a phone tree.
When a 9-1-1 call is made from the animation studios, ALI/ANI only transmits one location/address for us to respond to, regardless of where the caller may be; huge problem if the caller doesn’t know where they’re calling from within the studio or can’t speak for some reason (anaphylactic problem). There are inherent delays to fire or medical while responders wait for the correct location.
A culinary school has and continues to have numerous sites spread out through the city, but only one billing address on the ALI/ANI , so we’ve responded to one address only to find out that the medical problem (cut hand/fingers) is in another district altogether.
- El Centro County. Our county offices use a multi-line telephone system but when they dial 9-1-1 it comes up on our screen as only located at the source. This creates a nightmare for us as the County has multiple buildings in a 4 radius block we are unsure unless advised where to send the resourced needed.

⁶⁰ Order Instituting Rulemaking 10-04-011, CPUC, at 6, available at, http://docs.cpuc.ca.gov/word_pdf/FINAL_DECISION/116400.pdf.

- Placer County. At this time, if a 9-1-1 call is made from the North Lake Tahoe office [of a power company], the call goes to the South Lake Tahoe 9-1-1 Center in El Dorado County because the PBX information shows the South Lake Tahoe office address. Should an emergency arise and 9-1-1 call not be directed properly, a life threatening delay could occur.
- Siskiyou County. There are two different college campuses, one is the satellite campus and one is the main campus in another city. The VoIP provider/installer didn't test to make sure the calls were going to the right PSAP. Basically, nobody did any tests to see that the call were routed correctly.⁶¹

Consumer expectations for 9-1-1 do not change for ECS. Hotel guests, college students, bank employees and remote workers all expect to dial 9-1-1 and have a call taker answer his or her call for help, be able to call them back if required and dispatch emergency responders to their location. From a caller's perspective, interconnected VoIP service is, for the most part, similar to traditional telephone service, and its users reasonably expect it to function the same.

Finally, it is important to note that the future of enterprise communications is software and cell phone based.⁶² As a result, many organizations will have no means of dialing 9-1-1 except through mobile devices or company-owned UC software, as legacy ECS systems are replaced—placing even greater importance upon the need for nationwide E9-1-1 ECS uniformity.

The cost-benefit analysis clearly supports the Commission proceeding with a rulemaking on E9-1-1 rules for ECS. ECS E9-1-1 failures present material risk to public safety and property. Eliminating or significantly reducing such failures is possible through economical IP-based solutions available on the market today.

⁶¹ Response to CPUC Questions on MLTS, CALNEA in collaboration with the California County Coordinators Task Force at 11-13 (2010), available at: <http://docs.cpuc.ca.gov/EFILE/rulc/125391.pdf>.

⁶² 2016 Dialpad Survey at § 03 (finding that 54% of the surveyed enterprises did not provide a desk phone to every employee, 59% of survey respondents consider the desk phone to be an outdated piece of technology and 54% of enterprise employees believe the desk phone will be a nonessential tool in the next 3-5 years); August 2016 Frost & Sullivan Report at 11, 35 (finding that 52% of enterprise respondents allow their employees to use company-owned devices for personal telephony).

C. Jurisdictional Authority

West Safety believes that existing law and precedent provide the Commission with sufficient authority to propose ECS E9-1-1 requirements. Statutory authority granting Commission jurisdiction over ECS equipment, services and operations and access to E9-1-1 sources from Sections 1, 4 and 255 of the Communications Act and the CVAA.⁶³ The Commission has relied upon this authority to regulate equipment manufacturers, including Part 68 of the Commission rules on the connection of terminal equipment to the PSTN, and to impose E9-1-1 obligations on non-common carrier services and activities in a variety of contexts.⁶⁴

⁶³ See 47 U.S.C. §§ 151 (defining the Commission's mission "to make available . . . a rapid, efficient, Nationwide, and world-wide wire and radio communications service with adequate facilities . . . for the purpose of promoting the safety of life and property through the use of wire and radio communications"), 154(i), 255 (requiring telecommunications service providers and equipment manufacturers to ensure that their services and devices are accessible and usable by persons with disabilities, if readily achievable); *see also* 47 U.S.C. § 303 (granting Commission authority to "regulate the kind of apparatus to be used with respect to its external effects"); Wireless Communications and Public Safety Act of 1999, PL 106-81, 113 Stat 1286 (1999) (9-1-1 Act) (codified at 47 U.S.C. § 251(e)(3)) (delegating to the Commission the responsibility to "designate 9-1-1 as the universal emergency telephone number for reporting an emergency to appropriate authorities and requesting assistance"); *id.* at § 615 (the Commission "shall encourage and support efforts by States to deploy comprehensive end-to-end emergency communications infrastructure and programs, based on coordinated statewide plans, including seamless, ubiquitous, reliable wireless telecommunications networks and enhanced wireless 9-1-1 service"); New and Emerging Technologies 9-1-1 Improvement Act of 2008 (Net 9-1-1 Act), PL 110-283, 122 Stat 2620 (2008) (codified at 47 U.S.C. § 615a-1(c)) (authorizing the Commission to promulgate regulations and modify its regulations over time as necessitated by changes in the market or technology to ensure IP-enabled voice providers are able to comply with their obligation to provide E9-1-1 services).

⁶⁴ See, e.g., *In the Matter of Revision of the Commission's Rules to Ensure Compatibility with Enhanced 9-1-1 Emergency Calling Systems*, CC Dkt. No. 94-102, Second Report and Order, 14 FCC Rcd 10954, 10992-93 (1999) (directing manufacturers of mobile units with analog cellular capability to incorporate an approved 9-1-1 processing mode into such handsets); *Facilitating the Deployment of Text-to-9-1-1 & Other Next Generation 9-1-1 Applications*, PS Dkt. Nos. 10-255, 11-153, Report and Order, 28 FCC Rcd 7556, 7587-605 (2013) (finding direct and ancillary authority to impose text-to-9-1-1 bounce-back requirements on providers of interconnected text messaging applications, including OTT providers); *id.*, Second Report and Order and Third Further Notice of Proposed Rulemaking, 29 FCC Rcd 9846, 9878-81 (2014) (extending text-to-9-1-1 requirements to interconnected text providers under CVAA and ancillary authority to promote safety of life and property); *Reliability and Continuity of Communications Networks, Including Broadband Technologies*, PS Dkt. Nos. 13-75, 11-60, Report and Order, 28 FCC Rcd 17476, 17487 (2013) (adopting Part 12 rules requiring providers of direct 9-1-1 services to take steps designed to ensure reliable and effective 9-1-1 service).

Courts have affirmed that Congress has granted the Commission broad authority over public safety and 9-1-1.⁶⁵

Although there are certainly interstate limits to the Commission’s Title I authority, ECS equipment, services and operations tie directly to the Commission’s jurisdiction over interstate networks and originating 9-1-1 access (distinguishable from the dedicated 9-1-1 system and related services). Moreover, the critical safety concerns associated with ECS are irrefutable.

The CVAA has specifically provided the Commission with authority to implement recommendations by the EAAC, several of which are relevant to this proceeding.⁶⁶ For example, the EAAC recommended that the FCC promulgate rules that (i) require covered entities take steps in development and deployment of NG9-1-1 systems to permit individuals with disabilities to make multimedia NG9-1-1 emergency calls, (ii) ensure individuals with disabilities are able to contact NG9-1-1 using the same devices that they use for daily communication, (iii) ensure individuals with disabilities are able to access 9-1-1 from any point in the United States to obtain accessible, reliable, interoperable emergency services using the same technique/number to call, (iv) ensure IP-enabled network providers and operators do not install features, functions, or capabilities or setup or configure network equipment in any manner that would impair or impede communication with PSAPs by individuals with disabilities, and (v) require location conveyance in NG9-1-1 for all communication modalities.⁶⁷ The Commission also has authority under the CVAA to adopt “any other regulations, technical standards, protocols, and procedures as are

⁶⁵ *Nuvio Corp. v. FCC*, 473 F.3d 302, 311 (D.C. Cir. 2007) (recognizing “[t]he broad public safety and 9-1-1 authority Congress has granted the FCC” and rejecting “any argument that 9-1-1/E9-1-1 services are purely intrastate and therefore the Commission has no jurisdiction in this area”).

⁶⁶ 47 U.S.C. § 615c(g).

⁶⁷ See, e.g., EAAC Report and Recommendations at 19-38, Recommendation Nos. P1.1, P1.2, P1.3, P2.5, P3.1, T4.1, T5.3, T5.5 (2011), https://apps.fcc.gov/edocs_public/attachmatch/DOC-312161A1.pdf.

necessary to achieve reliable, interoperable communication that ensures access by individuals with disabilities to an Internet protocol-enabled emergency network, where achievable and technically feasible.”⁶⁸ Moreover, a nationwide ECS E9-1-1 rule would be consistent with Congress’s CVAA objective of “achieving equal access to emergency services for people with disabilities, as a part of the migration to a national Internet protocol-enabled emergency network.”⁶⁹

Alternatively, the Commission has the necessary ancillary authority to regulate ECS manufacturers and service vendors and entities responsible for providing E9-1-1 capabilities to ECS callers. The Commission may adopt rules that are “reasonably ancillary to the Commission’s effective performance of its statutorily mandated responsibilities.”⁷⁰ Ensuring users can rely on ECS to obtain access to E9-1-1 services promotes the availability and effectiveness of 9-1-1 service. This objective is consistent with the Commission’s statutory authority to ensure consumers can reach emergency services to promote the safety of life and property and the CVAA mandate regarding the migration to fully NG9-1-1 capable systems.

D. The Record Demonstrates That the Commission’s Best Option is to Devise Forward-Looking and Effective ECS E9-1-1 Rules

West Safety supports and commends state efforts to adopt laws and regulations for ECS E9-1-1. However, the comments above in Section II.A explain West Safety’s opposition to continued reliance on state legislation as the exclusive substitute for Commission regulation.

⁶⁸ 47 U.S.C. § 615c(g).

⁶⁹ *Id.* at § 615c(a); Senate Report at 1; H.R. Rep. No. 111-563 at 19 (2010) (House Report) (stating that the purpose of the CVAA is to “update the communications laws to help ensure that individuals with disabilities are able to fully utilize communications services and equipment and better access video programming”).

⁷⁰ 47 U.S.C. § 154(i) (“The Commission may perform any and all acts, make such rules and regulations, and issue such orders, not inconsistent with this chapter, as may be necessary in the execution of its functions.”).

Resolving the safety gap in ECS E9-1-1 requires a uniform national standard to ensure some benchmark level of compliance. The state of the ECS market and the cost-benefit analysis, outlined above, support the Commission issuing a notice of proposed rulemaking, and then final action to adopt rules.

Congress's ongoing effort to enact Kari's Law is an excellent first step toward a nationwide standard. The proposed text is clear and effective, and West Safety is hopeful that the bills in circulation will become law. However, even if Kari's Law passes Congress and becomes law, the gap in ECS E9-1-1 will remain. Kari's Law, as currently drafted, would address only two of the four essential components for ECS E9-1-1—direct 9-1-1 dialing and onsite notification. The ongoing Congressional effort does not and should not constrain the Commission from proposing a comprehensive regulatory backstop to ECS E9-1-1.

The NOI seeks comment on the status of voluntary best practices and voluntary standards for ECS E9-1-1, and the role such practices and standards should play in Commission action.⁷¹ There are a number of standards, best practices and standards bodies that may be relevant to establishing appropriate techniques and methodologies for achieving ECS E9-1-1 capabilities.⁷² West Safety believes that additional best practices and standards development is not required at this time and should not delay adoption of a federal ECS E9-1-1 rule.

Relying on voluntary compliance to secure ECS E9-1-1 adoption and policy objectives is not appropriate and has proven ineffective. The gap in public safety caused by ECS is too large and dangerous to ignore, and the motivation of enterprises, operators and voice providers is too

⁷¹ NOI ¶¶ 28, 39-41.

⁷² See, e.g., National Fire Protection Association (NFPA) 1221, Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems, at § 8.6 (v. 2016), available at: <http://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=1221>.

low to entrust with voluntary compliance. Past assertions by commenters that state action and industry best practices will close the ECS E9-1-1 gap have proven hollow.⁷³ Only federal regulation of ECS E9-1-1 will permanently close the safety gap by driving further development and migration to low cost and highly effective E9-1-1 solutions for IP-based ECS.

West Safety recommends that the Commission proceed with a rulemaking and propose rules that serve as backstop to state regulation. Effective E9-1-1 regulation of ECS should incorporate at least the following elements:

- 1) **Direct access to 9-1-1:** ECS equipment and services should be default configured to directly initiate a 9-1-1 call without requiring a user to dial a prefix, additional digit or access code such as “9”.
- 2) **Onsite notification:** ECS equipment and services should be manufactured, designed, configured and maintained to support and provide an automatic alert, ELIN and ERL to a designated central contact point on the premises from which a caller dials 9-1-1.
- 3) **Adequate and accurate location provisioning:** ECS equipment and services should be manufactured, designed, configured and maintained to support and provide one validated ERL for each 7,000 square foot workspace within each floor. Small buildings with less than 7,000 sq. ft. on a single level, located in a single contiguous property should not be required to provide more than one ERL.
- 4) **Callback number:** ECS equipment and services should be manufactured, designed, configured and maintained to support and provide one ELIN per workstation. The ELIN must enable the PSAP to bypass an ECS attendant such as the front desk or security office and directly reach the extension of the 9-1-1 caller.
- 5) **Direct routing to local PSAP:** Absent a disruption in ECS service, all 9-1-1 calls from ECS should be routed and terminated to the local PSAP. ECS equipment and services

⁷³ See Comments of Verizon, CC Dkt. No. 94-102, at 7 (filed Feb. 28, 2005) (“[T]he demonstrated ability of states to address traditional multi-line telephone system E-911 compliance issues eliminates the need for federal intrusion into matters properly within state jurisdiction.”); Comments of AT&T Inc., CC Dkt. No. 94-102, at 9-10 (filed July 5, 2012) (“National standards are the most cost-effective approach to meeting this public safety concern.”); Comments of The Telecommunications Industry Association, CC Dkt. No. 94-102, at 13, 21 (filed July 5, 2012) (“TIA has long held the position that the development of voluntary consensus-based standards should be deferred to over prescriptive regulations. . . .”; “[W]e believe that states are in the best position to bring into the reality of effective delivery of accurate MLTS location information. . . .”); Comments of Verizon, CC Dkt. No. 94-102, at 6 (filed July 5, 2012) (“[T]he Commission should build upon the important work that NENA has already undertaken in this area and encourage manufacturers and operators, together with public safety stakeholders, to initiate an industry-based standards development process. . . .”).

should be manufactured, designed, configured and maintained to support direct routing and termination to the local PSAP.

- 6) **Implementation schedule:** ECS equipment and services manufactured, sold, offered for sale, installed or used prior to the effective date of the rules should have six years to comply with new regulations. ECS equipment and services manufactured, first sold, offered for first sale, installed or used after the effective date of the rules should have two years to comply with new regulations.
- 7) **Limitation of liability:** Assuming compliance with the ECS E9-1-1 rule, ECS equipment and service vendors and ECS operators should be immune from liability for any harm arising from the use or attempted use of ECS to dial 9-1-1.

Consistent with the state and federal NENA Model Legislation, the proposed regulations should be simple, flexible, technology-neutral and forward-looking. ECS equipment manufacturers and service vendors and hosted ECS operators should be responsible for providing the E9-1-1 capabilities for compliance. ECS managers and on-premises operators should be jointly responsible for configuring, installing and maintaining ECS to ensure compliance with the rules. Special ECS technologies and use cases not capable of complying with the ECS rules should be permitted to apply for a waiver or forbearance. With these basic principles in hand, West Safety believes that the Commission can craft backstop ECS E9-1-1 regulations without imposing undue burdens on ECS participants.

III. CONCLUSION

West Safety appreciates the opportunity to provide these comments and respectfully requests that the Commission proceed with a rulemaking for a nationwide rule requiring ECS support of E9-1-1 capabilities.

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Respectfully submitted,

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