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Enhanced 9-1-1 for Multi-line Telephone Systems

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Final Version **Model Legislation** **Enhanced 9-1-1 for Multi-line Telephone Systems**	
The digits 9-1-1 are designated as the emergency telephone number. Enhancements to the 9-1-1 system typically enables the caller's telephone number and billing number to be displayed to the Public Safety Answering Point (PSAP). As a result, when the caller is calling from a single-line telephone or a Multi-line Telephone System (MLTS) serving a compact area, the address associated with the caller's telephone number can be retrieved and usually provides a reasonably precise identification of the caller's location. Public safety agencies increasingly rely on the Enhanced 9-1-1 system to provide dependable and precise information about the caller's location and a reliable number to call back in order to reach the caller. However, in some cases 9-1-1 calls made from telephones connected to Multi-line Telephone Systems may not be precisely located by the 9-1-1 system, eliminating some of the benefit of Enhanced 9-1-1. This lack of adequate location information can be life threatening if the caller cannot supply the correct location. The nature of 9-1-1 calls is such that the likelihood for the need to respond directly to the caller with minimal delay increases with the type of calls where the caller for some reason cannot provide information to the PSAP. Related problems occur when the caller is remote from the location supplied to the 9-1-1 system. In this instance not only is response delayed but limited public safety resources are dispatched where they are not needed. There may also be considerable disruption in business operations as the response units attempt to locate the caller. The purpose of this model legislation is to require Multi-line Telephone Systems to provide a sufficiently precise indication of the caller's location, while avoiding the imposition of undue burdens on system manufacturers, providers and operators of MLTS.	***Supporting Information Explanation*** *This right-hand column provides supporting information for the rules in the left-hand column to assist regulators in understanding the **rationale** for the proposed legislation (i.e., why a particular rule is required and/or the logic behind its provisions), and the **implications** of such legislation (i.e., what outcome will result or action will need to taken as a result implementing this provision). It is not intended that the commentary in this column become part of the final legislation .* The FCC should also take action to incorporate into Part 68 requirements for Multiline Telephone Systems that will facilitate the implementation of Enhanced 9-1-1 on PBX, Key, Hybrid and Centrex systems.
Section 1. Definitions	
"Alternative Methods of Notification" - Having the ability to locate the emergency caller and initiate emergency response. The adequacy of alternative methods of notification and responding to emergencies would be	

determined by appropriate governmental authorities operating pursuant to applicable legal requirements.	
"Alternative Methods to Support Enhanced 9-1-1" - Methods used by a MLTS Operator to permit an 9-1-1 emergency response team reasonable opportunity to quickly locate a caller as alternatives to the MLTS signaling needed to produce the automatic display of caller location information on the video terminal of the call-taker.	These alternatives include: • MLTS Operators use of Attendant-Notification (See Definition) Used by hotels/motels, hospital institutions, or any businesses that have an attendant. The need for a full-time attendant for such entities is controversial. • MLTS redirection of calls to a Private 9-1-1 Answering Point (See Definition) This method is used in some campus environments, military bases, prisons, and the like. • Alerting devices (such as lights and alarms) near the telephone that has dialed 9-1-1 These devices are triggered when a person dials 9-1-1 from a nearby telephone. • A device that plays a pre-recorded message telling the 9-1-1 call-taker where the caller is located.
"Automatic Location Identification (ALI)" - The automatic display at the PSAP of the caller's telephone number, the address/location of the telephone and supplementary emergency services information.	
"Automatic Number Identification (ANI)" - The Telephone number associated with the access line from which a call originates.	
"Building Unit Identifier (BUI)" - A Room number or equivalent designation of a portion of a structure/building.	
"Call Back Number" - A number used by the PSAP to re-contact the location from which the 9-1-1 call was placed. The number may or may not be the number of the station used to originate the 9-1-1 call.	Although not required by this model legislation, the completion of a return call by the PSAP is feasible for many MLTS configurations and is helpful in assisting emergency response.
"Direct Inward Dialing (DID)" –The ability for a caller outside a	DID is normally associated with a specific public switched

company to call an internal extension without having to pass through a switchboard operator or attendant at the MLTS.	telephone network service offering.
"Emergency Location Identification Number" (ELIN) - A valid North American Numbering Plan format telephone number, assigned to the MLTS Operator by the appropriate authority, that is used to route the call to a PSAP and is used to retrieve the ALI for the PSAP. The ELIN may be the same number as the ANI. The North American Numbering Plan number may in some cases not be a dialable number.	**Rationale:** To differentiate from ANI which is the telecom industry term which has a specific meaning. **Implications:** The NENA Database Committee will complete work to ensure that the Emergency Location Identification Number (ELIN) is incorporated into the Calling Telephone Number field of the Data Exchange Format Standard.
"Emergency Response Location (ERL)" - A location to which a 9-1-1 emergency response team may be dispatched. The location should be specific enough to provide a reasonable opportunity for the emergency response team to quickly locate a caller anywhere within it.	If a MLTS has all of its telephones confined to a small building, the street address of that building is sufficient caller location information for the purposes of Enhanced 9-1-1 Calling. The MLTS telephones are said to be in a single Emergency Response Location (ERL), defined by the street address. But this street address is the location information that would normally appear on the 9-1-1 call-taker's terminal. So, there is no need for the MLTS to be modified to transmit caller ELIN, and for more precise caller location information to be loaded into the ALI database. There is considerable disagreement as to how large an ERL can be. However, there is agreement that a building with less than 7,000 square feet of floor space is small enough. There is also agreement that if MLTS telephones are scattered over more then 40,000 square feet, then more precise caller location is needed for example, a street address, building identifier, floor number and/or room number.

"Key Telephone System" - A type of Multiple-line Telephone System designed to provide shared access to several outside lines through buttons, or keys, typically offering identified access lines with direct line appearance or termination on a given telephone set.	
" Local Notification" - A system capability whereby a call to 9-1-1 from a MLTS extension is directed through the 9-1-1 Network to a Public Safety Answering Point and simultaneously to an switchboard operator, attendant, or designated personnel where assistance can be provided to the Public Safety Answering Point to locate the caller and/or to assist in directing response. For Local Notification, the call back number shall be a phone number that can be dialed from the PSTN, which will be answered by the switchboard operator, attendant or designated personnel. Local Notification must include the capability for the switchboard operator, attendant or designated personnel to identify the location of telephones that have dialed 9-1-1.	
"MLTS"- A Multi-line Telephone System (MLTS) comprised of common control unit(s), telephone sets, and control hardware and software. This includes network and premises based systems. i.e., Centrex and PBX, Hybrid, and Key Telephone Systems (as classified by the FCC under Part 68 Requirements) and includes systems owned or leased by governmental agencies and non-profit entities, as well as for profit businesses. **"MLTS Operator"**- The entity that either owns, or leases/rents from a third party, and operates a MLTS through which a caller/person may place a 9-1-1 call through the public switched network.	
"MSAG" - Master Street Address Guide, a database of street names and house number ranges within the associated communities defining emergency services zones and their associated emergency services numbers to enable proper routing of 9-1-1 calls.	
"Private 9-1-1 Emergency Answering Point" - An answering point operated by non-public safety entities with functional alternative and adequate means of signaling and directing response to emergencies. Includes training to individuals intercepting calls for assistance that is in accordance with applicable local emergency telecommunications requirements. Private 911 Emergency Answering Points are an adjunct to public safety response and as such must provide incident reporting to the public safety emergency response	

centers per local requirements.	
"Public Safety Answering Point" – a facility equipped and staffed to receive 9-1-1 calls.	
"Shared Residential MLTS Service" - The use of a MLTS to provide service to residential facilities even if the service is not delineated for purposes of billing. For purposes of this definition, residential facilities shall be liberally construed to mean single family and multi-family facilities including Extended Care Facilities and Dormitories.	
"Shared Telecommunications Services" - Includes the provision of telecommunications and information management services and equipment within a user group located in discrete private premises in building complexes, campuses, or high-rise buildings, by a commercial shared services provider or by a user association, through privately owned customer premises equipment and associated data processing and information management services, and includes the provision of connections to the facilities of a local exchange and to interexchange telecommunications companies.	
"Station Identification" - A telephone number dialable from the public switched network, which provides sufficient information to permit a return call by the Public Safety Answering Point to the caller or a telephone nearby the caller.	
"Workspace" - The physical building area where work is normally performed. This is a net square footage measurement which includes hallways, conference rooms, restroom, break rooms but does not include wall thickness, shafts, heating/ventilating/air conditioning equipment spaces, mechanical/electrical spaces or similar areas where employees do not normally have access**.**	**Rationale:** For situations that are close to the area limits, it needs to be clear for MLTS Operators what constitutes a workspace area. **Implications:** Avoids requests for clarification later.
"9-1-1 Service Provider" - An entity providing one or more of the following 9-1-1 elements: network, CPE, or database service.	

Section 2. Shared Residential MLTS Service	
Operators of Shared MLTS service serving residential customers are required to assure that the telecommunications system is connected to the public switched network such that calls to 9-1-1 result in one distinctive Automatic Number Identification (ANI) and Automatic Location Identification (ALI) for each living unit, unless the facility maintains, at all times, Alternative Methods To Support Enhanced 9-1-1.	
Section 3. Business MLTS	
For a MLTS connected to the public switched network and serving business locations of one employer, the MLTS Operator shall deliver the 9-1-1 call with an Emergency Location Identification Number (ELIN) which will result in one of the following: a. an ERL which provides a minimum of the building and floor location of the caller, or b. an ability to direct response through an alternative and adequate means of signaling by the establishment of a private answering point, or c. a connection to a switchboard operator, attendant or a designated individual which provides for the establishment of Local Notification capability. Exceptions to the above requirements are as follows: a. Workspace less than 7,000 sq. ft., and located on a single contiguous property is not required to provide more than one ERL. b. Key Telephone Systems are not required to provide more than one ERL.	In evaluating the acceptability of a proposed alternative method of notification, consideration should be given to whether and how the building is occupied outside normal working hours. **Rationale:** In the interest of being cost efficient, it should be possible to provide the desired level of ERL using only the basic ANI and trunk group selection functions. Until the FCC requires MLTS manufacturers to provide the capability to aggregate groups of stations and standardizes MLTS network interfaces for communicating ELIN information, the requirements should not be more stringent. While not ideal, this is a significant improvement over the existing requirements. **Exceptions:** a. This limits the burden on small business most, of which will be less than 7,000 sq. ft. In addition, emergency response teams can generally search areas less than 7,000 square feet quickly. b. Key Telephone Systems (as opposed to PBX) use direct line selection and it is not practical to segment lines in a way that differentiates building floors. Since Key Telephone Systems generally serve only small workspace areas, there will not be

c. - MLTS Operators with less than 49 stations installed and occupying not more than 40,000 sq. ft and located on a single contiguous property are not required to provide more than one ERL. **Shared Telecommunications Services.** Providers of Shared Telecommunications Services shall assure that the MLTS is connected to the public switched network such that calls to 9-1-1 from any telephone result in Automatic Location Identification for each respective ERL, as defined in this section, of each entity sharing the telecommunication services.	many situations where the desired level of ERL information is not provided. Other MLTS, such as PBX's and Hybrids (Systems that incorporate the functionality of both Key Telephone Systems and PBX), are not subject to this exemption even though they may utilize some direct line appearances that appear on more than one station set. Operators of such Key Telephone, PBX and Hybrid Systems should inform individual system users of the appropriate 9-1-1 dialing procedures for their sets. c. Includes all types of MLTS.
Section 4. Hotel/Motel	
Hotel and Motel MLTS shall permit the dialing of 9-1-1 and the MLTS Operator shall ensure that the MLTS is connected to the public switched telephone network such that either: (a) 9-1-1 calls originating from the hotel or motel MLTS shall provide the PSAP with the ability to clearly identify the address and Building Unit Identifier of the 9-1-1 caller through the delivery of ANI and/or ELIN, that results in the subsequent retrieval of ALI by the PSAP, for each telephone set within the facility, or (b) provide an automated means which will connect the caller, PSAP and knowledgeable designated individual(s) at the facility when 9-1-1 is dialed. For option (b) the designated individual(s) may supplement or replace the ALI record with specific location information, by effectively communicating to the PSAP the specific location of the caller.	

Section 5 - ALI Database Maintenance	
Where applicable, MLTS Operators must arrange to update the ALI database with appropriate MSAG valid address and callback information for each MLTS telephone, such that the location information specifies the ERL of the caller. These updates must be made as soon as practicable for new MLTS installation, or within one business day of record completion of the actual changes for previously installed systems. The information in the ALI database is proprietary to MLTS Operators and may not be disclosed or used for any purpose other than facilitating emergency response to a 9-1-1 call.	**Rationale:** Database updates are encouraged on a regular basis, however due to some administrative limitations MLTS Operators may require additional time. Regardless, changes should be completed in accordance with database update standards. NENA Database management standard recommends that all service providers transmit MSAG valid 9-1-1 updates daily to database management and/or selective routing system provider.
Section –6. Industry Standards	
MLTS Operators shall be considered to be in compliance when the MLTS complies with E9-1-1 generally accepted industry standards as defined by the State (agency to be defined by each State). The telecommunication carriers are responsible for providing interconnectivity through the use of generally accepted industry standards.	**Rationale:** Rules need to be technology neutral and forward looking to accommodate the introduction of new technologies. Wireless, IP telephony, and small MLTS are known areas needing standards work. Tomorrow there will be others. - Industry standards greatly assist users in purchase decisions and manufacturers regarding product implementation decisions. Regulators should ensure that interconnection to the 9-1-1 system is made available by 9-1-1 Service Providers in accordance with generally accepted industry standards. Competition for database access and 9-1-1-system interface capability should be encouraged. Specific standards should not be encoded in the rules. Standards change over time and the administrative burden for regulators to keep up with such changes would be excessive. Industry standards are developed by accredited Standard Bodies such as TIA, TIS1 and IEEE and by non-accredited industry such as NENA. Both are important and should be accepted. **Implications:**

	It will be several years before private wireless and IP-based systems and many small MLTS can be connected to the E9-1-1 system in a way that communicates the desired level of ERL information. States need to determine if Standards Bodies have completed their work which would direct compliance of IP based systems with E9-1-1 systems. To improve the ubiquity of E9-1-1 service, regulators will need to be proactive in encouraging industry to develop needed standards. The FCC should be encouraged to take the lead in this effort.
Section 7. Dialing Instructions	
Many MLTS require a caller to dial a prefix, usually the digit 9, before dialing any outgoing call. The MLTS Operator must take all reasonable efforts to assure that potential 9-1-1 callers are aware of the proper procedures for calling for emergency assistance. Dialing instruction requirements shall apply to all MLTS Operators whether any other exemptions apply.	This is often accomplished by placing stickers or cards containing the appropriate 9-1-1 dialing instructions on or near each MLTS telephone.
Section 8. MLTS Signaling	
MLTS shall support Enhanced 9-1-1 calling by using any generally accepted industry standard signaling protocol, designed to produce an automatic display of caller information on the video terminal of the PSAP call-taker, unless the MLTS Operator is exempt or a waiver has been granted in accordance with State rules and regulations.	**Rationale:** ATIS Committee T1S1, and TIA Committee TR-41 are developing new digital signaling protocols that will make it easier and cheaper for most MLTS installations to support Enhanced 9-1-1 Calling. These committees will seek American National Standards Institute (ANSI) accreditation of the new protocols. The local telephone company should be responsible for assuring that when these protocols are used by a MLTS, they are supported by their local exchanges so that ELIN information is properly communicated to the PSAP.

Section 9. MLTS Operator Education	
Public agencies providing 9-1-1 educational programs are encouraged to develop a program to educate MLTS Operators related to accessing 9-1-1 emergency telephone systems and coordinate adequate testing of the MLTS interface to the 9-1-1 system.	**Rationale:** This issue could or should be addressed by public agency as they see fit. This helps ensure proper education on the use of 9-1-1. This will also assist in educating MLTS Operators and users on laws, rules and requirements on providing access to 9-1-1. Governmental 9-1-1 programs are the logical entity to ensure that MLTS Operators are in compliance with state laws/rules affecting these systems. **Implications:** Improper education and lack of knowledge can affect the proper deployment of supporting Enhanced 9-1-1 Calling by the MLTS Operator.
Section 10. Limitation of Liability	
No MLTS Manufacturer, Provider, or Operator shall be liable for any civil damages or penalties as a result of any act or omission, except willful or wanton misconduct, in connection with developing, adopting, operating or implementing any plan or system required by this act.	

Section 11. Exemptions	
In facilities offering alternative and adequate means of intercepting the emergency calls, those facilities shall provide training to individuals intercepting the call in accordance with applicable local emergency telecommunications requirements. **MLTS in Areas Without Enhanced 9-1-1 Service:** MLTS Operators in areas without Enhanced 9-1-1 service are exempt from the signaling and database maintenance regulations. MLTS Operators lose this exemption 18 months after Enhanced 9-1-1 service becomes available.	
Non-Dispersed MLTS: MLTS with a single ERL and less than 49 stations are exempt from the signaling and database maintenance regulations. Requirements for MLTS and Wireless MLTS Operators to provide dialing instructions shall still apply.	**Rationale:** The location information from a single ERL that normally appears on the call-takers video terminal is (by definition) sufficient to locate a caller quickly at any MLTS telephone.
MLTS using Alternative Methods of Enhanced 9-1-1 Support: MLTS Operators that employ alternative methods of Enhanced 9-1-1 Support are exempt from the signaling and database maintenance regulations in accordance with State rules and regulations. The requirements of this act shall not apply to the following types of equipment until two years after the effective date of a FCC ruling addressing implementation of Enhanced 9-1-1 support by such equipment: 1) MLTS Wireless Telephones; 2) MLTS IP Telephones; and 3) IP Based MLTS. An MLTS, using a combination of conventional stations and IP or Wireless Station, is subject to this exemption for calls made from the IP Based or Wireless Stations.	**Rationale:** The legislature should identify a designated jurisdiction such as the 9-1-1, Fire Marshal or other designated agency to judge the adequacy of Alternative Methods. Consideration should be to businesses who may or may not require alternative means on a 24 hour basis. **Rationale:** We provide exceptions for MLTS wireless telephones for several reasons. The technology for locating a wireless caller within a building is currently not developed. The percentage of MLTS wireless telephones is very small. And, it's difficult to justify including them while excluding regulations for cordless telephones, which are far more numerous, and which pose the same risk to 9-1-1 callers. Some new design MLTS handle telephone calling via Voice-over-Internet-Protocol (VoIP). Today, there is no method for support of Enhanced 9-1-1 Calling by this technology. There is no way to determine where a VoIP caller is, or of specifying a valid callback

	number. For example, how do we call johndoe@anynet.com? Industry standards committees such as TIA TR-41.4 are developing solutions to these problems. These solutions will likely take several years to develop and several more to deploy. Requiring support of Enhanced 9-1-1 Calling now by VoIP MLTS would require replacement of such technology already deployed and inhibit the deployment of this valuable new technology.
Section 12. Waiver Provisions	
MLTS Operators that are not exempt from these regulations may seek a waiver, if bringing the system into compliance is impractical. A designated authority in accordance with State rules and regulations may grant waivers. The local exchange carrier is not authorized to grant waivers or enforce compliance with this act. Nothing in this section is intended to relieve employers of their obligations under federal and state workplace occupational safety and health statutes and rules.	**Rationale:** In cases where a Hybrid System is configured with Key System functionality, a waiver may be required. The legislation should identify an agency or entity, such as the Fire Marshall, etc. for judging the need for waivers.
Section 13. Effective Date	
The provisions of this act shall take affect 6 months after enactment where E9-1-1 MLTS support service is available. MLTS installed two years or more after the effective date of this Act shall comply upon installation. Existing systems, or those installed within two years of the effective date of this act shall comply within 7 years after the effective date of this Act. E9-1-1 MLTS support service is deemed to be available if: (a) the serving central office can accept ELIN information for the MLTS using generally accepted industry standard interfaces, (b) facilities are in place to accept the ERL information provided by the MLTS, and (c) the PSAP is equipped to utilize the ERL information. The choice of industry standard interface is the option of the MLTS Operator.	**Rationale:** Ubiquity is a key issue in E9-1-1 policy formulation. How ubiquitous do we want the service to be throughout the state? How quickly do we want to reach the desired level of ubiquity? Who should bear the cost of mandated ubiquity -- E9-1-1 system operators or private system operators? Seven (7) years represents a reasonable consensus between the needs of MLTS Operators to amortize their systems and generally accepted replacement cycles. MLTS Operators should not be required to equip their systems for E9-1-1 support if the E9-1-1 system is not in place and operational.

MLTS Operators of MLTS systems not connected to the E9-1-1 system because the chosen interface standard is not available from the local exchange carrier shall report this information to the 9-1-1 governing body in accordance with State rules and regulations.	Regulations need to be forward looking and technology neutral, and not enshrine old technologies, such as analogue CAMA trunks, where newer more cost-effective technologies are available. Major population/business centers will adopt new technologies much sooner than rural areas since they tend to have competitive pressures and are better equipped to take advantage of the economies and benefits new technologies offer. MLTS Operators have an economic incentive to comply with E9-1-1 requirements as part of their risk management considerations. Standard interfaces such as ISDN, where available, are a much more cost-effective solution for the MLTS Operator than CAMA. All central offices are not equipped for ISDN PRI, though they could be upgraded to do so. Letting MLTS Operators choose the 9-1-1 standard interface rather than the Local Exchange Company will encourage the modernization of MLTS access to the 9-1-1 system. Reporting MLTS not connected to the E9-1-1 system because the chosen E9-1-1 interface standard is not available will provide important market information (a) to regulators as to the state of E9-1-1 ubiquity, and (b) to LEC's concerning the demand for new E9-1-1 interfaces. The 9-1-1 jurisdiction may be a state or local official responsible for emergency services and public safety. **Implications:** MLTS Operators will implement E9-1-1 support more willingly where they have a choice of technology and the newer more cost-effective technologies are available. This will be especially

	true for smaller systems. Unless state regulators mandate 9-1-1 system upgrades, ubiquitous 9-1-1 support, especially in non-urban areas, could take a long time.