560 CMR 2.00: STATE 911 DEPARTMENT
STANDARDS FOR ENHANCED 9•1•1

Appendix A

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STATE 911 DEPARTMENT

Standards for Enhanced 9•1•1

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Definitions

Abandoned Call: a call placed to 9-1-1 in which the caller disconnects before the call can be answered by the PSAP attendant.

ADA: Americans with Disabilities Act of 1990.

Agency: the organization responsible for administering, directing and managing the affairs and business of the Board, under the direction of an Executive Director.

Alternate Routing: the capability of automatically rerouting 9-1-1 calls to a designated alternate location(s) if all 9-1-1 trunks from a central office or to a PSAP are in a "make busy" mode or out of service. May also be activated upon request, or automatically if detectable, when 9-1-1 equipment fails or the PSAP itself is disabled.

Alternative Local Exchange Carrier (ALEC): [also known as CLEC - Competitive Local Exchange Carrier] a company which provides local telephone exchange service in competition with Bell Atlantic.

American Sign Language (ASL): a visual language based on hand shape, position, movement, and orientation of the hands in relation to each other and the body.

Answering Position: an appropriately equipped location within a PSAP that is used to receive incoming 9-1-1 calls.

Approved by the Board: a simple majority vote by members of the Statewide Emergency Telecommunications Board taken at a public meeting of the Board at which quorum of the Board is present.

ASCII: an acronym for American Standard Code for Information Interexchange which employs an eight bit code for the purpose of transmitting data.

Audible Signal: a sound which indicates an incoming 9-1-1 call.

Auto Dial: a PSAP function which allows an attendant to dial an outgoing programmable telephone number with a single button.

Automatic Call Distributor (ACD): equipment that distributes incoming calls to available PSAP attendants in the order the calls are received, or holds calls until an attendant becomes available.

Automatic Number Identification (ANI): an Enhanced 9-1-1 service capability that allows for the automatic display of the telephone number used to place a 9-1-1 call.

Automatic Location Identification (ALI): an Enhanced 9-1-1 service capability that allows for the automatic display of information relating to the geographical location of the telephone used to place a 9-1-1 call.

Average Busiest Hour: the one hour period during the week statistically shown over time to be the hour in which the most emergency telephone calls are received.

Barge-In Capability: the capability for multiple PSAP operators to establish simultaneous access to any emergency line or trunk in prior use for the purpose of assisting fellow personnel with difficult calls.

Baudot: a seven bit code, only five of which are information bits. Baudot is used by text telephones to communicate with each other.

Board: the Statewide Emergency Telecommunications Board.

CAD Interface: the means of automatically introducing the ALI data into a computer aided dispatch (CAD) system, rather than manually entering the information.

Call Relay: disposition of a 9-1-1 call by the notation of pertinent information by the PSAP attendant who forwards the information to the appropriate agency.

Call Referral: disposition of a 9-1-1 call by advice to the caller of the appropriate numbers to call other than 9-1-1.

Call Transfer: the extending of a 9-1-1 call by a PSAP attendant to connect the caller with the appropriate agency.

Central Office: a telephone company facility that houses the switching and trunking equipment serving telephones in a defined area.

Central Office Modification: hardware and/or software changes to a telephone company central office to specifically accommodate Enhanced 9-1-1 service.

Central Office Upgrade: scheduled hardware and/or software changes to a telephone company central office to improve the overall telephone service from that site.

Computer Aided Dispatch (CAD): a computer-based system intended to increase the efficiency and accuracy of public safety call handling and dispatching.

Dedicated Trunk: a telephone circuit used for one purpose only; i.e., transmission of 9-1-1 calls.

Dedicated Network: a point to point or multipoint network where resources (switching or transmission facility) are reserved for a particular customer or type of traffic.

Default Routing: the capability to route a 9-1-1 call to a designated (default) answering point when the incoming 9-1-1 call cannot be selectively routed due to an ANI failure, garbled digits, or other cause.

Duplicate Street Name: a street name in which the name and any associated designator is exactly the same (example: Pine St. and Pine St.; NOT Pine St. and Pine Rd.)

Diverse Routing: the practice of routing calls through different circuit paths in order to prevent total loss of the 9-1-1 system in the event an individual circuit is disabled.

DMS: Data Management System, a system of manual procedures and computer programs used to create, store and update the data required for selective routing and ALI information in support of Enhanced 9-1-1.

DPU: (Massachusetts) Department of Public Utilities.

DPU Annual Report: the document that the telephone company must file with DPU concerning the residential directory assistance revenues and related programs funded from those revenues, including Enhanced 9-1-1.

Emergency Service Zone: a defined geographical territory consisting of a specific combination of law enforcement, fire, and emergency medical service coverage areas.

EMS: Emergency Medical Services. Municipal based or private, under municipal contract or volunteer rescue squads or hospital based Advanced Life Support agency/providers, whose sole purpose is to provide EMS to a municipality or group of municipalities.

BLS: Basic Life Support. An EMS agency providing a level of basic life support service to a

community.

ALS: Advanced Life Support. Advanced EMS provided by Paramedics or EMTs with advanced training and who may not necessarily be part of a community's BLS service.

Enhanced 9-1-1 Equipment: equipment located at the PSAP or controller type equipment located at the telephone company central office that provides or supports Enhanced 9-1-1 capability.

Fixed Transfer: the capability of a PSAP attendant to transfer a 9-1-1 call using a single button.

FX: Foreign Exchange

Foreign Exchange: a service connecting a telephone to a remote exchange providing the equivalent of local service from the distant exchange.

Host-Remote: the relationship between conventional central office switching equipment and a Remote Switching Unit (RSU) in another facility which usually has limited capability and may not be able to function independently if connecting links from the host office are interrupted.

Identical Street Name: (see Duplicate Street Name)

Instant Playback Recorder: a device that allows for the instant playback of the audio portion of the last 9-1-1 call.

Logging Recorder: a device which records date, time, voice, and TDD/TT communications, and other transactions involved in the processing of calls to the PSAP.

MCO: Maintenance Control Office

Municipality: any city or town in Massachusetts

MSAG: Master Street Address Guide

NET: New England Telephone and Telegraph Company or Bell Atlantic or successors.

PBX: Private Branch Exchange, a private telephone system allowing communications within a business and between a business and the outside world.

Public Safety Answering Point (PSAP): a facility assigned the responsibility of receiving 9-1-1 calls and, as appropriate, directly dispatching emergency response services or transferring or relaying emergency 9-1-1 calls to other public or private safety agencies.

A Primary Public Safety Answering Point is equipped with automatic number identification and automatic location identification displays, and is the first point of reception of a 9-1-1 call. It serves the municipality in which it is located, and in other cities and towns as may be determined by the Board. It is recommended as a system goal, that a primary PSAP be located in a centralized, consolidated radio dispatch facility that serves all public safety agencies in a region or municipality.

Secondary Public Safety Answering Point: a facility equipped with automatic number identification, automatic location identification displays and all other features common to primary PSAPs. It receives 9-1-1 calls only when they are transferred from the primary PSAP or on an alternate routing basis when calls cannot be completed to the Primary PSAP.

Limited Secondary Public Safety Answering Point: a facility equipped, at a minimum, with ANI/ALI display/printout capability. It receives 9-1-1 calls only when they are transferred from the primary PSAP or on an alternate routing basis when calls cannot be completed to the primary PSAP. Data sent to a limited secondary PSAP cannot be re-routed to another location and may not necessarily be transmitted simultaneously with the voice call.

Public Switched Network: a multipoint network which provides the capability to establish connections to essentially all customers regardless of location.

Redundancy: having one or more "backup" systems available in case of failure of the main system.

Regional PSAP: a PSAP which is operated by or on behalf of two or more municipalities of the Commonwealth as a Primary PSAP for, at a minimum, the inter-municipal operation of Enhanced 9-1-1 call taking and call transfer activities. Such facility may also be engaged in, pursuant to inter-municipal agreements in force, the dispatching, or control of public safety resources serving several jurisdictions.

Ringing Public Safety Answering Point: a facility equipped for the receipt of voice communications only, and may not necessarily operate 24 hours each day. It receives 91-1 calls that are transferred from the primary PSAP.

Selective Routing: the method to direct 9-1-1 calls to the appropriate PSAP based upon the geographical location from which the call was placed.

Shall: indicates a mandatory obligation to act.

Should: indicates a recommendation or that which is advised but not required.

Silent Call: a 9-1-1 call received at a PSAP and no audible voice or tone is received.

Supervisory Call Monitoring: the capability for supervisory personnel to listen to calls in progress for

purposes of quality assurance and training.

Tandem: a switching system in the Enhanced 9-1-1 telephone network that establishes 9-1-1 call routing.

TDD/TT/TTY: a telecommunications device consisting of modems that permit typed telephone conversations with or between deaf, hard of hearing or speech impaired people.

TDD Call Diverter: a device that monitors and detects Baudot tones and then automatically routes the TDD call to a specified position.

TDD Detector: a device that monitors a trunk for Baudot tones and upon recognition, indicates the receipt of that type of call with a response sequence.

Telephone Company: includes all persons, firms, corporations, associations and joint stock associations or companies, as defined in M.G.L. c. 159 furnishing or rendering local telephone exchange service.

Text Telephone (TT): a machine that employs graphic communication in the transmission of coded signals through a wire or radio communications system. TT is interchangeable with the term "TDD" or "telecommunications device for the deaf."

Trunk: incoming 9-1-1 circuit.

Trunk Seizure: the point a which a call is assigned to a trunk and acknowledgment is provided by the 9-1-1 call processing equipment.

Uninterruptible Power Supply (UPS): a system designed to provide power, without delay or transients, during a period when the normal power supply is incapable of performing acceptably. (NFPA 1221)

9-1-1 System Design - Technical Standards

(1) Network - Central Office

(a) Modification of Central Offices In the annual report that NET must submit to the DPU or that any other telephone company may submit to the DPU, the telephone companies shall identify all costs associated with modifying, upgrading, and programming central offices that have been allocated to the 9-1-1 funding structure. The telephone companies shall explain the method and reason for any and all such allocations.

Enhanced 9-1-1 modifications in central offices should be coordinated with general central office upgrades where practical and where such coordination does not significantly delay program implementation.

In scheduling central office upgrades, telephone companies shall

1.) consider the goal of public safety as a criterion of utmost importance.

2.) take Enhanced 9-1-1 growth in Massachusetts into consideration, and

3.) make every effort to reduce the total costs that are allocated to telephone companies' rate payers either through the Enhanced 91-1 program funding structure or through the telephone companies' general recovery of their costs for central office upgrades.

(b) Central Office Upgrade. The telephone company shall also provide to the Board, on a quarterly basis, the current schedules for upgrading central offices.

(c) Host-Remote Central Offices. In host-remote telephone central office arrangements, the telephone company shall, where feasible, provide emergency reroute solutions for any potential central office failure.

(d) 9-1-1 Digit Recognition. Provisions in the network shall ensure that only calls in which all three digits (9-1-1) are dialed, shall enter the 9-1-1 system. The network shall also prevent larger dialing sequences which contain the digits 9-1-1, from entering the 9-1-1 system.

(e) Foreign Exchange And WATS Service. The telephone company shall allow for access to 9-1-1 from intra-state foreign exchanges and contiguous interstate foreign exchanges in states providing Enhanced 9-1-1. The telephone company shall also allow for access to 9-1-1 from intra-state WATS service providers. Calls placed to 9-1-1 should be routed to the PSAP serving the area in which the facility (i.e. business) is located.

(f) Forced Disconnect. The 9-1-1 system shall be engineered to allow for forced disconnect of 9-1-1 calls placed to all levels of PSAPs. This will prevent blockage of 9-1-1 lines.

(g) Coin Free Dialing. Each telephone company and owner of a private coin telephone in the state shall convert each public or private coin or coinless telephone to dial tone first capability to allow 9-1-1 calls to be made without first inserting a coin or paying any other charge. Each provider of public or private coin or coinless telephones shall provide access to the Enhanced 9-1-1 PSAP serving the geographic location of the coin phone, and prominently display instructions on how to use the service. Conversion of said telephone shall be made prior to cutover in the community where the instrument is located.

(2) Network - Trunking.

(a) Grade of Service. The number of incoming Enhanced 9-1-1 trunk lines to each PSAP shall be based upon a grade of service of P.O1. A P.O1 grade of service means that not more than one 9-1-1 call in 100 will receive a busy signal during the average busiest hour. The size of the served population and the 9-1-1 call volumes experienced by the PSAP will determine actual trunking. The telephone company shall submit network performance reports to the Board annually. These reports shall include the percentage of calls blocked for each four week period during the average busiest hour for each tandem area, and shall specify the percentage of calls blocked from the end office to the tandem and the tandem to the PSAP.

(b) Minimum Trunking Requirements. There shall be a minimum of two dedicated incoming 9-1-1 trunks at each PSAP and a minimum of two dedicated trunks from each telephone company or Alternative Local Exchange Carrier (ALEC) central office to any tandem.

The telephone company in cooperation with the PSAPs and Secondary PSAPs shall conduct a telephone traffic study of all existing basic 9-1-1 and seven-digit emergency numbers to assist in

determining the proper amount of Enhanced 9-1-1 trunks. The telephone company shall also be responsible for designing the network of the 9-1-1 systems to ensure that the systems are adequately trunked in order to achieve P. O1 grade of service on an incoming and transfer basis.

Each PSAP shall also have at least one outdial non-published telephone line to allow for administrative purposes associated with the 9-1-1 system.

(c) Call and Data Routing Diversification. The telephone company shall ensure that the routing of 9-1-1 calls through the network and ALI information through the data link network shall be diversified as much as possible. PSAPs shall maximize the use of cable diversification into their facilities. The program shall provide diversified cable routing from central offices to primary and full secondary PSAPs when the primary PSAP has six or more positions.

(d) Default and Alternate Routing. The telephone company in cooperation with the PSAPs shall also design the 9-1-1 network to allow for default and alternate routing capabilities.

(e) Network Requirements for Call Transfer. The transfer of 9-1-1 calls from a primary PSAP to any secondary PSAP or ringing PSAP shall be accomplished through a dedicated/switched network. Costs associated with the transfer of data and voice shall be covered by revenues generated for the Massachusetts Enhanced 9-1-1 Program. All transfers shall be exempt from any toll charges.

The telephone company shall provide data links to allow for the transfer of ANI and ALI data from the primary PSAP to secondary and limited secondary PSAPs. All data communication lines to and from a primary PSAP shall operate at a rate of not less than 2400 baud.

The telephone company shall also design the network and install customer premises equipment that will allow the PSAP to transfer a 9-1-1 Call and disengage from the conversation without disconnecting the 9-1-1 Caller.

(3.) Network - System Repair/Diagnostics.

(a) The telephone company shall establish and maintain a dedicated Enhanced 9-1-1 Service Response Center (SRC). Access for this center shall be provided via a uniform statewide toll free number with sufficient lines and operator staffing to provide adequate service response.

This center shall be staffed on a 24 hour, seven days a week, 365 days per year basis. To provide emergency maintenance coverage outside of normal business hours, the Telephone company may forward the statewide system toll free access number to a centralized location staffed with personnel trained to provide the same level of maintenance detailed in these Standards.

(b) The concept of the SRC is to provide a single point of contact for all participating PSAPs in the state through a dedicated service team. This team will be responsible for the management of service and maintenance requests for the entire 9-1-1 system.

(c) The SRC shall develop a procedure for PSAPs to report Enhanced

9-1-1 equipment failures. All reported 9-1-1 system troubles or failures shall be received and prioritized to provide the highest level of repair or restoration available within the telephone company. Upon notification to the telephone company of any equipment failure, the telephone company shall commence repair service within four hours. In emergencies, where the equipment failure interferes with the receipt and processing of 9-1-1 calls, repair service shall commence within two hours. If adequate equipment spares exist at the PSAP that when used will remedy the problem, these time periods may be extended but shall not exceed 24 hours. (Paper and ribbon changes of the printer shall be the responsibility of the PSAP.)

(d) The telephone company shall maintain an escalation list available to all PSAPs with names of the current management assigned for the purpose of resolving or escalating any outstanding maintenance issues.

(e) The SRC shall have the authority necessary to direct, prioritize and escalate for the purpose of resolving any reported 9-1-1 system failures or troubles. This authority extends to any existing or future advanced centralized test center(s), data management system center(s), field forces deployment center(s) and other telephone company service or repair departments. The SRC shall also develop automatic escalation procedures for use by SRC personnel to ensure service response times that meet or exceed those defined in these Standards.

(f) In addition, the SRC shall provide the following in house capabilities:

1. Specially trained Network Service Manager(s) to proactively identify problem areas impacting the quality of service and to serve as the technical liaison between the PSAPs and the telephone company.
2. Specially trained Network Consultant(s) to write detailed 9-1-1 system installation, modification and circuit orders and provide assistance in the resolution of all 9-1-1 billing issues.
3. Specially trained Repair Service Assistants to build trouble reports and determine correct routing and handling.
4. Specially trained Test Technicians to provide immediate network testing and initiate dispatch of field repair technicians as needed.

(g) The SRC shall maintain an up to date, detailed profile of every PSAP in the state. This profile shall include as a minimum:

1. exact location and level of PSAP
2. number and type of positions
3. number and type of equipment
4. number and type of dedicated/switched voice/data circuits
5. maintenance control office
6. Tandem Central Office and PSAP end office
7. Maintenance Control Center
8. PSAP coordinator and alternate contact

(h) The SRC shall be responsible for coordinating the Emergency Service Listing on the inside front pages(s) of all Bell Atlantic white and yellow page directories and under individual municipalities including blue pages.

(i) The telephone company shall produce quarterly reports for the Board to document the efficacy and timeliness of system maintenance, monitoring activities, and repair call responses provided to the system.

(j) The SRC shall ensure that all personnel including repair service assistants who have the responsibility for the resolution of any 9-1-1 system trouble/problem shall have adequate knowledge and training to meet the 9-1-1 system service objectives.

(k) Telephone company supervisors will ensure that all company employees whose normal duties may include contact with 9-1-1 facilities are familiar with procedures designed to safeguard those facilities.

(4) Ensuring System Reliability

(a) Network Protection Plan. To prevent the widespread loss of Enhanced 9-1-1 service, the telephone company shall work toward eliminating any single point of failure that could compromise the reliability of the network. The telephone company shall endeavor to maintain Enhanced 9-1-1 network integrity, minimize the probability of system degradation and failure, and minimize the negative effects of degradation or failure should it occur. The company shall be attentive to costs in fulfilling these goals and shall provide cost data to the Board where there are alternative means for accomplishing these goals.

Network design concerns include, but are not limited to:

1. --single site Enhanced 9-1-1 Database Management System (DMS) center
2. --Enhanced 9-1-1 tandem switch facility vulnerability
3. --dedicated network facilities
4. --switched network facilities

One year from Board approval of the standards, the telephone company shall submit a plan to the Board to eliminate the potential for single point of failure design within the entire Enhanced 9-1-1 network. This plan is not intended to provide a duplicate network for each PSAP but rather to address eliminating any single point of failure which could result in a widespread loss of Enhanced 91-1 service. In its plan, the telephone company shall, to the greatest extent possible, review and reference the most technologically advanced practices of all the other Regional Bell Operating Companies which have addressed or are addressing similar network protection concerns which improve the safety of the customers they serve.

Upon approval by the Board, the telephone company and the Board will submit the plan to the Massachusetts Department of Public Utilities (DPU) for its review. The telephone company and the Board will work in concert to ensure an expeditious and favorable review by DPU. Subsequent to the determination that the expenditures associated with implementing the plan are prudently incurred expenses, the telephone company shall immediately begin to implement and complete the entire plan within two years.

The goal of the plan is to provide the greatest reliability for delivery of voice, data and

TDD/TTY to all PSAPs throughout the Commonwealth.

(b) Contingency Re-route Plans.

1. Telephone Companies. The telephone companies shall develop or review and present to the Board by January 1 of each year, a contingency plan or changes to the plan which shall ensure network integrity to minimize the probability of system failure and provide continued emergency telecommunications service in the event of 9-1-1 service interruption. The plan shall include alternatives for the 9-1-1 service in areas such as central office, database center and tandem failures, overall redundancy of the 9-1-1 system, reroute plans and disaster restoration plans.

2. Public Safety Answering Points. The PSAP shall devise a contingency plan to provide continued emergency service when the PSAP is out of service. The plan shall be submitted to the Board for approval and shall designate at least two potential alternate PSAP locations.

The plan shall include the PSAP's role as an alternate answering point, if applicable and ensure that such answering points are accessible to TDD/TT users.

Municipalities shall identify for its use, one of the board approved default answering points which will receive 9-1-1 calls that are affected by ANI or Selective Routing failures.

(5) Audio Monitoring Systems:

Municipalities may add audio monitoring equipment to the 9-1-1 system upon approval of the Board. Any request shall be accompanied by a technical description including connection at a demarcation point approved by the Board. The telephone company shall provide technical review and promptly report to the Board on the acceptability of said equipment addition. Equipment found to have a negative effect on the 9-1-1 system or call delivery to the primary PSAP shall not be approved. The Board reserves the right to order removal of equipment found to adversely affect the 9-1-1 system. Audio broadcast through said systems shall be confined to an area restricted to access by emergency communications personnel only. The municipality shall be responsible for all costs of installation and maintenance of said system beyond the demarcation point. Nothing in this section applies to broadcast of audio from limited secondary PSAP equipment.

9-1-1 Data Development Requirements

(1) Database.

(a) Database Development. All municipalities that elect to participate in the Enhanced 9-1-1 system shall work with the telephone company to verify street names, number ranges, and emergency service zones (ESZ).

The designated Municipal Coordinator and the telephone company shall ensure that changes, deletions, and additions to the Master Street Address Guide (MSAG) database should be made on an as occurred basis. Each city or town must review the

MSAG yearly to ensure accuracy of the data and the emergency service zones. Municipalities are encouraged to begin the development of the MSAG 12 to 18 months prior to the cutover of the 9-1-1 system. Municipalities and the telephone company should attempt to achieve a 98% accuracy rate with the 9-1-1 database.

(b) Selective Routing and ALI Database Update Requirements and Reports. After establishment of the service, it is the municipalities' responsibility to continue to verify the accuracy of the routing information contained in the master address file and to advise the telephone company of any changes in the street names, establishment of new streets, changes in address numbers used on existing streets, closing and abandonment of streets, changes in police, fire, EMS, or other appropriate agencies, jurisdiction over any address, annexations and other changes in municipal and county boundaries, incorporation of new communities, or any other matter that will affect the routing of Enhanced 9-1-1 calls to the proper PSAP.

The telephone company shall make every reasonable effort to update Selective Routing and ALI data on a daily basis so that the number of records "not found" shall not exceed one percent of the total number of database lookups per quarter. Any records not updated within the 24 hour period shall be updated within three business days of receipt with the exception of records containing "special" fields which may require verification.

The telephone company shall submit reports of database update performance to the Board on a quarterly basis. These reports shall include the total records updated for the Selective Routing and ALI databases during the quarter and provide a breakdown by the number of days required to complete each update.

(c) Reporting of Database Errors. The telephone company shall develop a format for PSAPs to report inaccuracies of ALI information and the misrouting of 9-1-1 calls. The format shall allow for a description of the problem, appropriate corrective action or information and proper verification by a municipal liaison.

Each call taker shall fill out a trouble report when a call is found to have erroneous database information. The information shall be forwarded through the PSAP coordinator to the telephone company in a format established by the telephone company.

(2) Automatic Location Identification (ALI). The ALI shall be displayed immediately for all classes of service at the time the 9-1-1 call is presented to a position. The ALI shall include the following data:

(a)*Repeat of Automatic Number Identification,
(b)*Automatic Location Identification,
(c)*Customer Name,
(d)*Class of Service to Include: BUSINESS / COIN (identifying callback capability) RESIDENCE / FX / PBX/ CELLULAR / NO RECORD FOUND
(e)*Responding Public Safety Agencies,
(f)*Persons with Disabilities Code,
(g)*Time,

(h) *Warning messages to verify location when class of service is FX, PBX, or Cellular. If space limitations of the "comment" field make messages impossible, a different and distinct field (ex. flashing, color, audible) may be permissible. ALI information shall use conventional English or logical abbreviations where necessary and shall not use single letter or digit codes.

(3) Addressing. Municipalities, in cooperation with the U.S. Postal Service, shall establish a house numbering system for all streets within their boundaries if one does not currently exist. The creation of duplicate street names in any municipality participating in the Enhanced 9-1-1 system is prohibited.

Existing identical street names in the same municipality will not be permitted unless the boundaries of commonly used village names within the municipality can be specifically identified. In the absence of delineated village boundaries, entire street names or at least street name designators for the duplicate streets must be changed.

Corresponding changes must also be made to all municipal signage and written notification be given to all property owners and residents of the addresses involved. It is recommended that the duplicate street with fewer residents be selected for name change to keep the number of inconvenienced citizens to a minimum.

(4) Other Classes of Service.

(a) Identification Codes for Persons with Disabilities. To assist responding agencies, a municipality may provide information in their MSAG submittal to allow notations in the E9-1-1 Central Database concerning disabled persons living at certain addresses. This information shall be gathered by municipal agencies from disabled citizens who identify themselves and choose to have such information noted. Municipalities are encouraged to use local mailings, local media, and other available vehicles to alert their citizenry to this feature.

Notations on disabled persons who are permanent or long term residents at an address should be included in the database. Information on persons who may be convalescing from a short term disability at their own residence or persons with permanent disabilities who may be temporarily living at a particular address should be retained on a locally maintained temporary advisory listing or local computer aided dispatch system (CAD) at the PSAP and other appropriate public safety facilities.

The telephone company shall make provisions in the ALI format to include specific codes to identify the possible existence of person(s) with disabilities and nature of said disability at the ALI location. The codes shall be established by the Board. Disability Indicator Forms are available at the Board office.

(b.) PBX Telephone Systems. Customers who subscribe to Bell Atlantic's Private Switch / Automatic Location Identification (PS / ALI) service and who are not equipped with ISDN - PRI trunks, shall provide a minimum of two dedicated specialized trunks to the appropriate number of 9-1-1 tandems as determined by the Board.

If for any reason, all dedicated trunk facilities are out of service, the PBX customer shall program its switch to route any 9-1-1 call through the existing

9-1-1 network.

The cost of all trunking, database development and access, and any additional equipment required to implement PS/ALI service is the responsibility of the customer.

(c) Wireless Service All wireless carriers in the state shall provide a minimum of two dedicated trunks from each of their switching offices (if in-state) or Point of Presence (if the switch is located out of state) to the 9-1-1 tandems. Provisions of ALI and ANI information shall be in compliance with FCC Docket #94-102 and all other applicable statutes and rulings.

Customer Premises Equipment

The telephone company shall select customer premises equipment (CPE) that integrates all technical and operational requirements possible as identified in the Massachusetts 9-1-1 Standards.

(1) 9-1-1 Answering Positions and Equipment.

(a) Enhanced 9-1-1 Answering Positions.

1.There shall be, at a minimum, two Enhanced 9-1-1 equipped answering positions established at each primary PSAP. Each answering position shall be similarly equipped with access to all incoming 9-1-1 lines, outgoing dedicated/switched lines, tie-lines, and dial out lines.

2. When six or more answering positions are required at any primary PSAP, additional answering positions shall be provided to monitor calls (supervisory positions) or to handle overflow.

3. Communities of up to 25,000 population may receive two answering positions; communities of 25,001 to 50,000 may receive up to three answering positions; communities of 50,001 to 100,000 may receive up to four answering positions and communities with 100,001 or more population shall be evaluated individually. Actual answering position levels shall be based on busy hour call volume and/or formula based upon service population, including seasonal and daily population fluctuations. These are general guidelines and may not necessarily dictate the number of actual positions approved by the Board.

4. It shall be assumed that:

a.) There will be 0.31 9-1-1 calls generated by every 1,000 population of the primary PSAP service area during the average busiest hour.

b.) That 90% of all 9-1-1 calls shall be answered within ten seconds and the average holding time (call duration) for each call shall be 90 seconds.

(b) Call Answer Threshold. Each PSAP shall have sufficient 9-1-1 equipped answering positions and staff to ensure that 90% of all 9-1-1 calls are answered in no more than ten seconds during normal peak operating

periods. 90% of all transfers from primary PSAPs to appropriate secondary, limited secondary and ringing PSAPs shall be initiated within 15 seconds from receipt of call.

(c) Rapid Access to Public Safety Support Services. Each PSAP shall be capable of quickly routing calls via auto-dial or fixed transfer button to public safety support services, when requests for same is included in the municipal plan and has been approved by the Board. When calls are extended to public safety support services, the PSAP shall provide to the Board on an annual basis, data related to call volume to each support service.

(2) 9-1-1 Equipment.

(a) Barge-In Capability. Customer premises equipment for all call takers, dispatchers and supervisory personnel shall provide barge-in capability. This capability shall be under the control of other PSAP operators offering assistance and shall not require the original call taker to add on the other personnel.

(b) Supervisory Call Monitoring. For purposes of quality assurance and training, customer premises equipment for supervisors shall be capable of monitoring incoming emergency calls.

(c) Public Safety Answering Points.

1. Primary Public Safety Answering Points. A primary public safety answering point shall be equipped with or benefit from the following features at a minimum:

a. automatic number identification (ANI)
b. automatic location identification display (ALI)
c. call detail information
d. redundant method of capturing, storing, retrieving or printing call detail information
e. selective routing
f. ability to transfer voice or TDD/TT and data
g. selective transfer
h. 30 minute uninterrupted power supply
i. TDD/TT communications capability
j. ability to receive and display Dual-Tone Multi-Frequency or equivalent for "Silent Call" procedure

2. Secondary Public Safety Answering Points. A secondary public safety answering point shall be equipped with the same functions as a primary public safety answering point, including the ability to transfer voice or TDD/TT; and data to another answering point. Equipment associated with each secondary PSAP shall meet the Primary PSAP equipment manufacturer's specifications and be the responsibility of the authority having jurisdiction in which the PSAP is located.

The Board shall approve or disapprove the establishment of all

secondary PSAPs as specified in St. 1990, c. 291, § 18B(b).

3. Limited Secondary Public Safety Answering Points. Limited secondary PSAPs must be equipped with at least one dedicated data link to receive "printout only" ANI/ALI information. Data sent to a limited secondary PSAP cannot be re-routed to another location. Equipment associated with each limited secondary PSAP shall meet the Primary PSAP equipment manufacturer's specifications and be the responsibility of the authority having jurisdiction in which the PSAP is located. The Board shall approve or disapprove the establishment of all limited secondary PSAPs as specified in St. 1990, c. 291, § 18B(b). There must be at least one telephone line to provide voice or TDD/TT communications for the transferring or relaying of calls from the transferring PSAP to the limited PSAP. Limited PSAP operators shall be responsible for provision and maintenance of voice telephone line(s).

4. Ringing Public Safety Answering Points. Ringing PSAPs are equipped for the receipt of voice communications only and may not necessarily operate 24 hours each day. It receives 9-1-1 calls from a primary or secondary PSAP.

(d) Interfacing with Pre-existing Telephone Equipment. All municipalities participating as a 9-1-1 PSAP at any level shall install customer premises equipment that meets all Massachusetts Enhanced 9-1-1 standards and general accepted industry standards to ensure system and functional compatibility with the network.

All lines necessary for proper Enhanced 9-1-1 call management shall terminate in a single telephone set at each position.

No 9-1-1 or seven-digit emergency lines shall terminate in equipment not approved by the Board and the telephone company. In addition, no non-emergency seven-digit lines should be terminated in 9-1-1 PSAP equipment, except as approved by the Board in accordance with their standards on interface.

(e) Combined Telephone Answering Equipment. Where practicable, combined telephone handsets and/or headsets should be utilized by PSAP personnel required to answer both 9-1-1 calls and non-emergency calls. Equipment should be equipped with volume control devices for receiving and transmitting and shall also have the capability to use either handset or headset interchangeable with headset priority without modification. PSAP operator's receive audio shall not exceed a level of 110 db Sound Pressure Level (SPL). The handset or headset microphones shall only be live when set is "off hook".

(f) Call Status Indicator. Each 9-1-1 trunk will indicate incoming emergency calls by both audible and visual indicators. Each outgoing trunk shall have visual display of its status.

(g) Call Detail Information. The program shall provide redundant printers at primary PSAPs for hard copy of call data and ALI information combined in one printout format. The program shall provide this capability at secondary PSAPs, but will not provide printer equipment at those secondary PSAPs. Call Detail Records can be stored on media other than paper if approved by the Board.

9-1-1 Call data information shall use conventional English or logical abbreviations where necessary and shall not use single letter or digit codes. Call detail information to be retained and printed shall include at a minimum the following information related to each call:

1. Automatic number identification
2. Automatic location identification
3. Time of 9-1-1 trunk seizure
4. Time the call was answered
5. Time the call was transferred, terminated or abandoned
6. Trunk number
7. Answering position number
8. Date 9-1-1 Call data information shall also be retained on unanswered calls and shall be printed and identified as unanswered.

(h) Automatic Call Distributors and Call Management Systems. Automatic Call Distributors may be a component of the 9-1-1 System in PSAPs which require six or more answering positions. The ACD is designed to answer, distribute and sequence calls in a high volume environment.

The number of answering positions used to determine whether a PSAP qualifies for ACD functionality shall not count designated monitor/overflow positions in the total.

Functions of a call distributor shall include providing to the PSAP administration, comprehensive call management data that will assist in managing and staffing the PSAP on a day to day basis.

(i) Equipment Safeguards.

1. Wherever practicable, service entrances for commercial power and telephone service shall be underground, at least to the respective utility's serving distribution facility. All commercial power and telephone lines entering PSAPs shall be encased in protective sheathing.

2. Wherever practicable, conductors shall extend as directly as possible to the PSAP equipment in conduits, shafts, raceways or overhead racks and troughs of a type of construction affording protection against fire and mechanical injury. Where cables or wiring are exposed to unusual fire hazards, they shall be properly protected. (NFPA 1221)

3. All facilities and equipment associated with 9-1-1 service shall be provided with protective measures to prevent accidental worker contact. Each protected termination shall be clearly identified.

4. Protected 9-1-1 lines shall not be opened, grounded, short circuited or manipulated in any way unless the appropriate PSAP has released the line.

5. Any individual working on 9-1-1 lines at the telephone company central office or the PSAP location shall provide proper identification to the PSAP supervisor or telephone company official. Any such individual shall be logged in and give a brief description of all activities or functions to be performed. All 9-11 lines shall be terminated on a separate and distinct termination block equipped with the latest technology to protect by visual warning, against tampering or any accidental interruption of service.

6. Modifications, changes, additions, or any other attempt to alter 9-1-1 Program provided equipment is strictly forbidden, with the exception of those authorized in writing by the Board. Paper and ribbon changes of the printer shall be the responsibility of the PSAP.

7. The telephone company shall ensure that adequate surge protection, grounding and lightning suppression devices are installed with the 9-1-1 equipment to protect it from unnecessary interruption.

8. All wiring shall comply with Massachusetts wiring codes.

(j) Replacement and Upgrade of Equipment. The telephone company shall have the responsibility for maintaining the telephone network. The telephone company must also maintain and replace, if necessary and reasonable due to normal wear and tear, the 9-1-1 customer premises equipment on a routine basis. The decision as to what maintenance and/or replacement is necessary and/or reasonable shall be subject to the review and approval or disapproval of the Board.

The telephone company shall upon recommendation and approval by the Board, upgrade/change the Enhanced 9-1-1 system on an annual basis in accordance with St. 1990, c. 291, § 18D(4).

(3) Ancillary Equipment.

(a) Telecommunication Device for the Deaf (TDD/TT). The program shall equip each PSAP with TDD/TT to meet the requirements of P.L. 101-336 (Americans With Disabilities Act of 1990) and should be sufficient to meet the needs of the population served by the PSAP. TDD/TT Detectors or Diverters shall be installed. When technically feasible, equipment shall be upgraded to permit switching automatically between Baudot and ASCII. All TDD/TT shall provide a printed record of conversations.

(b) Digital Recorders: Each primary PSAP shall receive an initial recorder provided by the program. If a reel-to-reel recorder was initially provided by the program, it shall be replaced with a digital recorder. Subsequent replacement recorders shall be the responsibility of the municipality. This recorder shall be of adequate capacity to record both sides of a conversation on each incoming 9-1-1 call; shall have the capacity to document the year, date and time of each recorded event and the capability to record both voice and TDD/TTY.

The recorder shall have the capability of retrieving TDD/TTY tones without jeopardizing the integrity of the call with audible or inaudible tones that cause disruption in the TDD/TTY tone translation. Each recorder shall feature complete full function integrated standby capability.

All Primary PSAPs are entitled to a 16 channel digital recorder. A Primary PSAP may petition the Board if it requires additional channel capacity. The Board will review the request and determine if the program will fund the increased channel capacity.

All PSAPs which accept a program supplied recorder are required to operate the same or similar featured equipment as long as they participate in the Enhanced 9-1-1 program.

If a PSAP chooses to upgrade the program provided recorder, the municipality will pay the difference between the cost of the program provided recorder and the recorder selected by the PSAP.

The program shall provide normal business day maintenance for those units supplied by the program. The program will only pay an amount equal to the maintenance cost of the program provided recorder for upgraded recorders.

Repair or replacement will not be provided for equipment that fails as a result of avoidable physical damage or abuse.

The program supplied recorder shall include a supply of 13 digital recording tapes.

Municipalities shall be responsible to retain the recording tapes for one year. Additional digital recording tapes may be provided with the approval of the Board.

(c) Instant Playback Recorders. To maintain system wide reliability, each primary and full secondary PSAP shall be equipped with instant playback voice recorders capable of recording both voice and TDD/TT for each answering position.

Instant playback recorders shall be independent from master logging recorder equipment and of solid state design with no moving parts.

They should have electronic voice storage, simultaneous record and playback capabilities, and be equipped with either reduced playback speed or message mark capabilities. The intent of this equipment shall be to record 9-1-1 and seven digit emergency lines only.

Instant playback recorders will be supplied to the primary PSAP at cutover.

The program shall provide maintenance for those units supplied by the program, however repair or replacement will not be provided for equipment that fails as a result of avoidable physical damage or abuse.

The purchase and maintenance of instant playback recorders at a full secondary PSAP will be the responsibility of the municipality.

(d) Computer Aided Dispatch. At a minimum, computer aided dispatch interface capability shall be available at the PSAP for ANI and ALI interface.

(e) Auto-dialers. Regional PSAPs or municipalities equipped with six or more answering positions shall be provided with double the number of single key auto-dial buttons provided in a standard configuration.

(4) Equipment Support.

(a) Emergency Power Provision. Each municipality shall equip the PSAP with an emergency power generator capable of providing for the essential power requirements of the facility to ensure continuous operation for a minimum of 24 hours during commercial power outages.

Sufficient fuel shall be available for 12 hours operation at full load if a

reliable source of supply is available, at any time, on two hours notice. If a source of supply is not reliable or readily available, or if special arrangements must be made for refueling as necessary, a supply sufficient for 24 hours operation at full load shall be maintained. (NFPA 1221)

The program shall provide an adequate uninterruptable power supply (UPS), with power conditioning capability to power primary PSAP emergency telephone service and protect Enhanced 9-1-1 and automatic call distributor (ACD)/call sequencer controller equipment. UPS equipment will ensure that emergency calls in progress and subsequent calls will not be interrupted during commercial power fluctuations and outages. It shall supply constant power for a minimum of 30 minutes to allow for manual or automatic transfer from the public service AC power to localized auxiliary AC power.

(b) 9-1-1 Mobile PSAP. The program shall provide mobile 9-1-1 answering point equipment to be utilized to provide uninterrupted 9-1-1 service when a PSAP is relocated, when feasible. Said mobile 9-1-1 answering point equipment will also be used as an emergency 9-1-1 PSAP to restore service during disaster situations. Other uses may include dispatcher training and public education.

(c) Equipment Room Modifications. Any cost associated with remodeling or build-out of facilities will be the responsibility of the municipality.

Operational Standards

(1) Public Safety Answering Point Administration.

(a) Municipal Coordinators. Every municipality participating in the Enhanced 9-1-1 system shall designate a person to serve as the local contact person with the Executive Office of Public Safety, the Board, and the telephone company for all issues regarding 9-1-1 service. The municipality may choose to identify a different individual to work directly with the telephone company on the MSAG. Any changes in the Municipal Coordinator shall be reported by the municipality in writing to the Board and the telephone company within ten working days.

(b) Statewide 9-1-1 Plan. Each participating municipality shall develop in cooperation with the telephone company a 9-1-1 plan in accordance with the law, standards and guidelines established by the Board.

(c) 9-1-1 System Cost. Upon receipt of a proposed plan from a municipality, the Board upon initial review, shall cost out that plan based on estimates provided by the telephone company. The telephone company shall provide the Board with initial cost estimates within ten business days. In addition, the telephone company shall provide to the Board on an annual basis, all the actual costs related to the implementation of Enhanced 9-1-1 in Massachusetts.

(d) Call Handling Coordination/Negotiations. Municipalities participating in the implementation of 9-1-1 shall be responsible for coordinating with all public safety providers served by the PSAP. All levels of PSAPs shall be required

to negotiate call handling procedures with all public safety agencies to ensure proper handling of emergency calls.

The PSAP and public safety providers served by the PSAP shall review these procedures every six months for the first two years and then annually thereafter and make changes as needed.

All levels of Secondary PSAPs not operating on a 24 hour basis shall negotiate prior to cutover and in writing, call handling procedures with the designated primary PSAP. Procedures shall be reviewed annually or on an as needed basis.

(e) Hours of Operation for Primary Public Safety Answering Points. Each participating municipality shall establish, staff and operate on its own or with one or more municipalities, an Enhanced 9-1-1 primary PSAP on a 24 hour a day, seven day a week basis.

(f) Non-Municipal Agencies Authorized as Public Safety Answering Points. Only municipal public safety agencies or groups of municipalities may operate Enhanced 9-1-1 PSAPs or authorize Enhanced 9-1-1 PSAPs to be operated, with the approval of the Board.

(g) Seven digit Telephone Numbers. Each PSAP shall maintain at least one seven-digit emergency number to be published in the white pages of the telephone book as a back up to 9-1-1. This number shall also be used for receipt of incoming emergency calls transferred to the PSAP by other PSAPs for certain alternate and default routing arrangements.

(h) Use of 9-1-1 Trunk. 9-1-1 trunks shall be used solely for the receipt of emergency 9-1-1 calls at primary PSAPs and the transfer of 9-1-1 calls to secondary PSAPs, limited secondary PSAPs, and ringing PSAPs.

(i) PSAP Security. All access to the PSAPs should be secured to prevent entry by the public or unauthorized personnel.

(j) Security of Data. Subscriber information provided in accordance with the 9-1-1 system shall be used only for the purpose of responding to emergency calls or for use in any ensuing investigation or prosecution, including the investigation of false or intentionally misleading reports of incidents requiring emergency service. The PSAPs must provide protection and confidentiality for ANI and ALI data. Each PSAP shall establish personnel security clearance standards that are acceptable to all public safety agencies served by the facility.

(k) Reporting of Equipment Failure. Each PSAP shall post and maintain the telephone number and written procedures for reporting equipment failure in telephone company supplied call handling equipment.

(l) Records Retention. All voice and TDD/TT recording of incoming 9-11 calls shall be retained as required by state regulation. Records of 9-1-1 call information shall be retained for a period of three years.

(m) Automatic Alarms or Alerting Devices. No individual or company shall be allowed to send an automatic alarm or other alerting device that causes the digits "9-1-1" to be automatically dialed and transmits a prerecorded signal or message to the PSAP on a 9-1-1 line, except those devices needed to request emergency assistance by persons who are disabled. Such devices shall require approval by the Massachusetts Office on Disability and the Board.

(n) Fixed Transfer and Auto-dial Options. Primary PSAPs shall give priority to the initial programming of fixed transfer options for the transfer of 9-11 calls to secondary PSAPs, limited secondary PSAPs and ringing PSAPs, as required for the dispatch of public safety services within the jurisdiction of the primary PSAP.

Any fixed transfer and auto-dial transfer options available after initial programming shall be programmed to provide for call transfer capability to other primary PSAPs in proximity to that PSAP's jurisdiction. This capability shall allow the PSAP to utilize the dedicated/switched 9-1-1 network to transfer 9-1-1 calls pertaining to emergencies outside its jurisdiction, to the appropriate primary PSAP.

Fixed transfer buttons shall only be programmable by the telephone company, with the approval of the Executive Director of the Board or designee.

Primary PSAPs and the Relay Service, which links the deaf community with the hearing community for non-emergency service, shall be provided with a current list of seven-digit telephone numbers for every primary PSAP in the state.

The list shall be used for the transfer of 9-1-1 calls or the relay of information regarding emergencies outside the jurisdiction of the PSAP, when fixed transfer or auto-dial transfer options are not available.

The list shall be compiled by the Service Response Center with the assistance of the Board and public safety organizations. It shall be updated as changes occur and distributed by the Board as necessary. Public Safety Agencies changing, adding, or deleting a seven-digit telephone number being used by a 9-1-1 system for emergency call information, shall submit this change in writing to the Board.

(o) Public Safety Answering Point Inspections. The Board or its designee may inspect each PSAP that utilizes Enhanced 9-1-1 network features to determine if it meets the requirements of said PSAP standards and all other technical and operational standards required by law.

If an inspection reveals that the PSAP is not in compliance with the technical and operational standards, the Board will take appropriate action up to and including intervention through the Massachusetts Attorney General's Office to cause the PSAP to come into compliance.

Public Education

(1) Public Education Program. Municipalities participating in the Massachusetts Enhanced 9-1-1 Program shall develop a public education program aimed at the emergency service needs of the community. The program should include a time line which provides educational materials prior to and on a continuing basis after cutover of the 9-1-1 system.

Based on the non-English speaking population of a community, the Municipal Coordinator shall determine if 9-1-1 public education materials need to be developed in bilingual/secondary languages.

(a) "9-1-1" The Designated Emergency Number. The digits "9-1-1" shall be the only published emergency number for municipalities participating in the Enhanced 9-1-1 emergency telephone system. The advertisement of any emergency telephone number other than "9-1-1" is prohibited. "9-1-1" shall also be the only published or advertised emergency number for those using TDD/TTY. The designation "9-1-1" shall only be used for emergency calls routed directly to a primary PSAP.

Advertised use in Massachusetts of the designation "9-1-1" in connection with any commercial product or service could lead to public confusion and is strictly prohibited.
(b) Display of "9-1-1" on Emergency Vehicles and Signs. The digits "91-1" when displayed on emergency vehicles, signs, or other forms of advertisement shall be printed in plain block type numerals with a "dash" (-) appearing between each number. This will minimize any potential misinterpretation of the digits. The digits "9-1-1" shall be the only emergency number displayed on vehicles, signs, or other forms of advertisement and the municipality is responsible for the expense of signage.

(2) Public Education Materials. The Agency and the telephone company shall assist municipalities with the 9-1-1 public education program through the distribution of materials in the form of brochures, telephone stickers and children's educational materials. 9-1-1 PSAPs shall be responsible for working with the Agency and the telephone company to ensure that an adequate educational campaign is maintained on a routine basis.

(3) Telephone Book Listing. Publishers of telephone directories which contain emergency numbers shall annually publish the digits 9-1-1 as the official emergency number on the inside cover of the telephone books for the municipalities participating in the Massachusetts 9-1-1 System.