

6 BUSINESS, FUNCTIONAL AND TECHNICAL REQUIREMENTS SECTION

6.1 INTRODUCTION

6.1.1 OVERVIEW

This Section contains the detailed Business, Functional and Technical requirements pertaining to the proposed system. In addition to meeting all other requirements of this IFB, Bidders must also adhere to all of the Mandatory (M) and Mandatory Optional (MO) Business, Functional and Technical requirements of this section to be responsive.

The State has determined that it is best to define its own needs, desired operating objectives, and desired operating environment. The State will not tailor these needs to fit some system a Bidder may have available; rather, the Bidder shall propose to meet the State's needs as defined in this IFB.

6.1.2 DESIGNATION OF REQUIREMENTS

Bidders must indicate their willingness and ability to satisfy these Requirements by marking the appropriate "Yes/No" column on Exhibit 20, Response to Business, Functional, and Technical Requirements. Answering "No" to any of the Mandatory (M) and Mandatory Optional (MO) Business, Functional and Technical Requirements in the Final Bid may result in the bid being deemed non-responsive, and therefore disqualified.

6.1.2.1 Mandatory Requirements (M)

Bidders must provide all Mandatory requirements which will be scored on a pass/fail basis. Failure to provide a response to each Mandatory requirement where indicated result in a Bid being deemed non-responsive and subject to disqualification.

6.1.2.2 Mandatory Optional Requirements (MO)

Mandatory Optional (MO) Requirements are those that the Bidder must provide, but is at the State's discretion to purchase. Failure to provide any one MO requirement where indicated may result in a Bid being deemed non-responsive and subject to disqualification.

6.1.3 BIDDER RESPONSE

For general system Requirements and Standards described in this IFB, Bidders shall meet or exceed the capabilities of the defined system in the specification. Bidders must ensure that the proposed system's functionality provides the Mandatory features in such a manner that the abilities of the Telecommunicator to perform their job is not degraded. The Technical Requirements for Customer Premise Equipment (CPE) have been identified as two (2) systems: a 9-1-1 CPE Turn-key Standalone System and the other a Host-Remote System.

6.1.3.1 CPE System Lifecycle (M)

The Bidder provided 9-1-1 CPE system shall be maintained and operational for a period of five (5) years consisting of one (1) year warranty and four (4) years maintenance, following system acceptance of the installation by the PSAP. Monthly Maintenance shall include any updates (hot fix/patches) to hardware and software, and local PSAP site service required to keep the 9-1-1 CPE system fully operational which may include parts as needed to replace obsolete technology.

6.1.3.2 Additional Monthly Maintenance (MO)

The Bidder shall offer additional monthly maintenance, as defined in Section 6.1.3.1, for years six (6) and seven (7) as Mandatory Optional.

6.1.3.3 Separate Bids (M)

If more than one 9-1-1 CPE System is offered, each Bidder must submit separate bids for each manufacturer that is being proposed.

6.2 BUSINESS REQUIREMENTS

6.2.1 BIDDER QUALIFICATIONS (M)

Bidder Qualifications are required for each 9-1-1 CPE Turn-key System and Host-Remote System, using Exhibit 19.1 and Exhibit 19.3 respectively. The Bidder shall provide experience supporting a minimum of one (1) year for each system type. The project examples submitted shall be completed from installation to acceptance within the last five (5) years and be the same type of system being bid. Instructions for Bidder Qualifications is provided in Exhibit 19, Bidder Qualification Form- Instructions.

6.2.2 BIDDER REFERENCES (M)

Bidder References, are required for each 9-1-1 CPE Turn-key System and Host-Remote System, using Exhibit 19.2 and Exhibit 19.4 respectively. Bidders must supply a minimum of one (1) reference supporting each system type and must receive a reference

satisfaction minimum rating of 18 points in each reference form. Instructions for Bidder References is provided in Exhibit 19, Bidder Qualification Form- Instructions.

6.3 GENERAL SYSTEM REQUIREMENTS

6.3.1 9-1-1 CPE SYSTEM STANDARDS (M)

6.3.1.1 Federal Standards (M)

All 9-1-1 CPE Systems provided through this multiple award contract shall meet or exceed the Requirements contained in the Federal Communications Commission (FCC) Rules and Code of Federal Regulations (47 CFR) and any other applicable part of the FCC Rules and Regulations.

All Intelligent Workstations (IWS) shall accommodate Wireless Enhanced 9-1-1 (E9-1-1) Requirements as outlined in Federal Communications Commission (FCC) Report and Order 94-102 and addenda. All components shall interface with existing E9-1-1 networks and display the appropriate Automatic Number Identification (ANI) and Automatic Location Identification (ALI) identified in Phase I and Phase II of the FCC Order, as specified in Alliance for Telecommunications Industry Solutions/Emergency Services Interconnection Forum (ATIS/ESIF) J STD-034 (for Phase I) and J STD-036 (for Phase II).

The display of information, as required by FCC 94-102, shall accommodate both Call-Path Associated Signaling (CAS) and Non Call-Path Associated Signaling (NCAS) methodologies as defined in those standards. The proposed system shall accommodate the most current State of California ALI Format.

6.3.1.2 National Emergency Number Association (NENA) and Industry Standards (M)

Bidders proposed system must meet the NENA and industry standards listed below. The standards shall be the latest version available on the date of contract award.

- 1) NENA Generic Standards for E9-1-1 PSAP Equipment, Technical Reference NENA 04-001, Issue 2, dated August 2000;
- 2) NENA Recommended PSAP Master Clock Standard, NENA 04-002, Issue 3, May 17, 2000;
- 3) NENA-02-010, Version 9 NENA Standard Data Formats for ALI Data Exchange & GIS Mapping including NENA Data Exchange Format Version 4 (Extensible Markup Language (XML) tagged data);

- 4) NENA Interface to IP Capable PSAP 08-501;
- 5) NENA Voice over Internet Protocol (VoIP) I1, I2, I3;
- 6) NENA Functional and Interface Standards for NG9-1-1 (i3), NENA 08-002;
- 7) NENA Detailed Functional and Interface Standards for the NENA i3, STA-010.2 (previously NENA 08-003);
- 8) NENA Methods for Location Determination to Support Internet Protocol (IP) -Based Emergency Services Information Document, NENA 08-505;
- 9) NENA Emergency Services IP Network Design for Next Generation 9-1-1 (NG9-1-1) Information Document, NENA 08-506; and
- 10) ATISJ-Std-036A and addenda.

6.3.1.3 NENA Standards for Next Generation 9-1-1 (NG9-1-1) (M)

NENA is currently developing standards that specifically address NG9-1-1. Bidders must commit to provide software, equipment and/or services that meet, or are capable of meeting, NENA NG9-1-1 Requirements and standards most currently available, no more than 18 months after final bid is submitted to the State. If a Bidder's equipment and/or service is determined to not be i3 compliant during the course of the multiple award contract, the Bidder must bring it to currently released NENA i3 standards at no cost to the State.

6.3.1.4 Future NENA Standards for Next Generation 9-1-1 (M)

Within 60 calendar days following publication of future NENA NG9-1-1 Requirements and standards, Bidder shall provide the State with an implementation plan demonstrating adoption within 18 months of the NENA publication that describes the process, cost and timeline that the Bidder intends to follow to upgrade equipment provided under this IFB to meet the NG9-1-1 standard.

6.3.1.5 Audio Quality (M)

Audio quality shall not be degraded by various compression methods within the 9-1-1 system. The estimated Mean Opinion Score (MOS) representing the end user perception shall be the same, or better, at the output compared to the input. The audio quality shall not degrade when a Telecommunicator transfers a call or conferences in a third party or when interconnected to other Public Safety Answering Point (PSAP)

equipment. The audio quality of the Bidder's equipment shall meet the following International Telecommunications Union (ITU) recommended standards:

- 1) ITU-T P.862 – Perceptual Evaluation of Speech Quality;
- 2) ITU-T G.131 – Talker Echo;
- 3) ITU-T G.711 – Pulse Code Modulation (PCM) of Voice Frequencies.

6.3.1.6 Acoustic Noise (M)

The acoustic noise generated by the power supplies, hard disks, fans or other components mounted within the PSAP dispatching area shall not exceed 40 decibels (dB) Sound Pressure Level (SPL) measured three (3) feet from the source in any direction.

6.3.1.7 Crosstalk (M)

The proposed system shall limit crosstalk to the following parameters:

- 1) Isolation between any speaker circuits and a transmit line shall be greater than 70 dB;
- 2) Isolation between any two 9-1-1 IWSs shall be greater than 70 dB;
- 3) Isolation between any two transmit or receive lines shall be greater than 70 dB ;
- 4) Crosstalk between audio channels or between different audio devices shall not exceed -70 dB at 1 kHz when compared to normal operating or listening level;
- 5) Frequency response: +/- 3 dB, 300 Hz to 3,400 hertz (Hz);
- 6) Total Harmonic Distortion: 1.5% full scale output at 1 kilohertz (kHz); and
- 7) Hum and Noise: Not to exceed -55 dB when measured at the Telecommunicator's headset or speaker and compared to normal operating level.

6.3.2 SYSTEM PHYSICAL REQUIREMENTS (M)

6.3.2.1 Commonly Available Components (M)

Even though there is the uniqueness of core components in the 9-1-1 call-taking equipment; Bidders shall utilize industry standard (commercially and commonly

available) components for such items as telephone handsets, telephone cords, headsets, headset cords, headset interface boxes, computer keyboards, computers, printers and non-9-1-1 software. Bidder shall test any third party accessories that the PSAP desires to use (such as headsets and non-9-1-1 software) to make sure they are compatible with the Bidder's CPE.

6.3.2.2 Electrical Requirements (M)

- 1) The 9-1-1 CPE System and all integrated components shall be designed to operate from a 120 ± 6 Variable Alternating Current (VAC), 60 ± 3 Hz, single-phase power source. If the Bidder's system operates on any other power source rating, the Bidder shall be responsible for any additional costs to the PSAP to accommodate other power source ratings. The 9-1-1 system power supplies shall withstand a minimum 20ms of Alternating Current (AC) electrical main disruption with less than five percent (5%) variation in output voltage.
- 2) Each component requiring 120 VAC power shall be equipped with three-wire grounded primary power input cords terminated with three-pin AC caps.
- 3) Each IWS, rack, cabinet or sub-system may contain an AC power On/Off switch.
- 4) All 9-1-1 CPE System circuitry shall be protected against damage from electrical overloads and primary power voltage surges by fuses and/or other current limiting devices selected to assure fast and positive protective action.
- 5) All power supplies associated with the system common electronics shall have redundancy and shall automatically switch to the redundant power supply when the primary power supply fails. Each power supply shall be designed to operate over an ambient temperature range of 0 – 60°C. All power supplies shall have output over-voltage protective circuitry that will automatically shut down in the event of an electrical overload or other negative electrical event.
- 6) Bidder shall provide the minimum grounding Requirements for their equipment to the PSAP as part of the pre-installation checklist as provided in Appendix A, Statement of Work (SOW). Each IWS and each separate rack or cabinet which is a part of the 9-1-1 CPE System shall have a defined ground point. All components of call processing system shall be connected to a common ground system.
- 7) Whenever applicable, the Bidder shall ensure that the common ground of the 9-1-1 CPE System is connected to any master ground system utilized by other technical systems and components within the building or at the PSAP location. This includes,

but is not limited to, equipment racks, radio equipment, microwave equipment and Computer Aided Dispatch (CAD) equipment.

- 8) Bidder shall test and notify the PSAP if the 9-1-1 CPE System ground is electrically equivalent to the master ground and that there is no voltage potential between the ground used by the 9-1-1 equipment and other technical equipment located at the premise, in order to install CPE.
- 9) In the event the building ground does not perform in compliance with the National Electrical Code (NEC), the repair of the building ground is the responsibility of the PSAP.

6.3.2.3 Uninterrupted Power Supply (UPS) (M)

Bidder shall provide each 9-1-1 CPE System, including each major system component (IWSs, servers, routers) adequate power failure backup systems and power conditioning systems to ensure that failures, spikes and brownouts from any source do not damage or shutdown any components of the 9-1-1 CPE System, NENA 04-001, Section 6.

- 1) The UPS is not intended to maintain power to the equipment for extended periods of time. The UPS provides power during the interval between when commercial power fails and the PSAP's own emergency power is on-line. Bidder shall provide all 9-1-1 CPE with uninterruptible power for a minimum of 15 minutes.
- 2) The UPS operation testing shall be included in the Bidder's SOW, preventive maintenance plan. The UPS equipment shall be replaced whenever the preventive maintenance testing proves that the UPS is not able to provide the CPE with uninterruptible power for a minimum of 15 minutes.

- 3) Since battery UPS systems degrade over time, the Bidder shall not reuse an existing UPS. The UPS (if battery based) supplied during installation shall have a manufacture date within six (6) months of the installation date.
- 4) Two (2) UPSs shall be provided that are capable of maintaining the backroom Automatic Number Identification (ANI) / Automatic Location Identification (ALI) server and ancillary equipment for 15 minutes under normal load conditions, one being the backup to the other. Each UPS shall condition the power to prevent harmful power spikes and brownouts from damaging the backroom and IWS equipment.
- 5) Bidder shall provide a UPS for each IWS capable of maintaining the equipment operational for 15 minutes under normal load conditions, either at each IWS or in the backroom sized appropriately for all IWSs.
- 6) The IWS UPS shall condition the power to prevent harmful power spikes and brownouts from damaging the equipment. The UPS equipment shall not be provisioned in any "series" electrical arrangement (where one UPS plugs into other UPS equipment in the power chain).
- 7) By mutual written agreement and where superior technical operation can be supported, the requirement to provide individual UPS equipment support may be superseded when the PSAP facility is supported by a robust building-wide operational UPS system that fully supports the operational floor and common backroom technical equipment. Such installations shall be maintained by the PSAP and the CPE Bidder shall not be responsible for the UPS. All such arrangements shall be approved in writing by CA 9-1-1 Branch in advance of operational use and as part of the written agreement between the PSAP and the Bidder.

6.3.2.4 Multiple Lines/Workstation Requirement (M)

Bidder shall provide a CPE system capable of connecting to:

- 1) A minimum of one (1) Centralized Automatic Message Accounting (CAMA) trunk or IP gateway for each workstation;
- 2) A minimum of two (2) 1 Measured-rate Business phone line or Centrex trunks for each workstation;
- 3) A minimum of four (4) or more ring-down trunks such as those to answer a front door intercom or a dedicated voice connection to remote locations.

6.3.2.5 CPE Expansion Requirement (M)

Bidders shall provide expansion capabilities of the CPE for additional telephone lines and stations. The design shall be modular to allow for future expansion beyond present Requirements.

6.3.2.6 Printing Capability at Local Public Safety Answering Point (PSAP) (M)

A PSAP in a Turn-key stand-alone system must be equipped with a networked laser printer that supports both black and white, as well as color printing requests from all CPE and Management Information System (MIS) workstations. The networked laser printer must be included and specified in the Bidder's bid. The printers included in the bid must include the following functionality:

- 1) Capable of network connectivity;
- 2) Minimum of printing 35 black and white pages per minute (ppm);
- 3) Capable of printing a minimum of up to 4,000 pages per month;
- 4) Ability to print on legal- and letter-sized paper; and
- 5) Minimum of 1200 dots per inch (dpi) x 1200 dpi black resolution;
- 6) Local Area Network (LAN) ready.

6.3.3 INTELLIGENT WORKSTATION (IWS) PHYSICAL REQUIREMENTS

6.3.3.1 IWS Hardware Requirements (M)

The IWS Hardware Requirements outlined below shall apply to an IWS deployed in a Turn-key Stand-Alone system or Host-Remote system.

The IWS shall be state-of-the-art, digital technology workstations with industry standard keyboard and mouse. The IWS shall be equipped with all necessary audio and video interface equipment to include keyboard, mouse, speakers and a minimum 19" inch flat panel monitor.

6.3.3.2 User Volume Controls (M)

User accessible volume controls shall be continuously variable from zero (0) to 110 dB at each Telecommunicator's IWS.

6.3.3.3 Standard Keyboard (M)

The keyboard shall be an industry standard enhanced 101-key type, or equivalent, equipment with a 12 foot cord with a Universal Serial Bus (USB) connector.

6.3.3.4 Mouse (M)

The mouse associated with each IWS shall be an "industry standard, commercial grade" two (2)-button type optical mouse with a scroll wheel, or equivalent, and supported by a USB) connection interface, and operable on a desktop without an associated mouse pad. The mouse cord shall be at least 12 feet long.

6.3.3.5 Keyboard Arbitrator (M)

Keyboard arbitrators shall be supplied for all IWSs to provide for the sharing of one keyboard that serves the 9-1-1 CPE System, with a minimum of four (4) ports, to connect with co-located Computer Aided Dispatch (CAD) system(s), radio system(s) and/or similar equipment.

6.3.3.6 Monitor (M)

Monitors shall meet the following minimum Requirements:

- 1) Viewable minimum 19" diagonal Liquid Crystal Display (LCD) / Light Emitting Diode (LED);
- 2) Viewing angle: Minimum 160 degrees (horizontal and vertical);
- 3) Native resolution: Minimum 1920 x 1080;
- 4) Response: eight milliseconds (8 ms);
- 5) Contrast: Minimum 500:1;
- 6) Brightness: 300 nits;
- 7) Color depth: 16.7 M24 bit colors;
- 8) Height and pivot adjustments;
- 9) Anti-glare/anti-static screen;
- 10) MPR-II compliant to insure low monitor emission levels;
- 11) Energy Star certified to reduce power consumption during inactive periods.

Bidders are also required to offer individual pricing for 24 inch monitors in Cost Worksheets, which meets or exceeds all of the specifications above. Bidder is responsible for providing compatible video cards for maximum monitor performance.

6.3.3.7 Auxiliary Keypad Dialer (M)

Any end point IWSs shall be equipped with a minimum 24 key programmable auxiliary keypad dialer that will allow the Telecommunicator to perform basic system function without using the computer keyboard. The IWS shall accommodate expansion to larger auxiliary keypad dialers when negotiated between the Bidder and PSAP.

6.3.3.8 Headset/Handset Capability (M)

The IWS shall provide the capability for an analog audio interface to a headset/handset and to the radio system arbitration unit to accommodate both radio and 9-1-1 audio in the same headset/handset.

6.3.3.9 Radio Dispatch Integration (M)

The IWS shall be capable to interface/integrate with the respective radio dispatch system. The Telecommunicator shall have the option to use the same headset for both radio and telephone conversations.

6.3.3.10 IWS Wiring (M)

Bidder is responsible to provide the following in support of IWS wiring:

- 1) Dedicated port jacks near the PSAP-owned CAD, logging recorder and third-party mapping equipment;
- 2) All console jacks and cabling. The wiring runs must be terminated to patch panels in the telephone room of each PSAP. A total of four (4) jacks shall be terminated at each 9-1-1 IWS, according to the Telecommunications Industry Association (TIA) / Electronic Industry Association (EIA) 568B standard. Two (2) cables shall be connected to RJ-11 jacks;
- 3) The jacks shall be labeled clearly at each terminating location; and the jack number must match the IWS number where it is located. For example: the first IWS #1 must have jack number one (1) installed. The jacks themselves must be labeled A through D and correspond with the patch panel located in the equipment room or wiring closet. All termination blocks shall have a cover and labeled "9-1-1 ONLY";
- 4) The jack reserved for voice logger applications shall be terminated on a telephony style block;
- 5) The jack reserved for telephony applications shall be terminated and labeled;
- 6) Cabling for USB or High Definition Multi-Media Interface (HDMI) shall be used by the PSAP when interfacing to associated equipment;
- 7) All wiring and neat cable management that will be required to support the IWS;
- 8) Surplus structured wiring available at each IWS for potential future applications.

6.3.3.11 IWS Logging Recorder Interface (M)

Each IWS shall provide an adjustable analog audio output or standard IP interface to the any logging recorder system. This interface is required to mute when the IWS is not active, so that background conversations are not offered to the logging recorder. It is the

required responsibility of the Bidder to terminate the logging recorder interface to a telephony style block, which must be located in the equipment room adjacent to the existing logging recorder interface blocks.

A minimum of one (1) output must be provided for each IWS to the logging recorder to allow for the recording of all telephone conversations handled by the Telecommunicator. The bid must include the cabling of the output to a demarcation point near the current interface for the PSAP logging recorder.

6.3.4 INTERCONNECTIVITY

6.3.4.1 System Connections (M)

The 9-1-1 CPE System shall not be specified nor installed at any PSAP by any vendor that allows access to the emergency call-taking equipment from any device that connects to the public Internet, or which allows transmission to call-taking equipment in a way that data files could be saved from the emergency call-taking equipment to devices that connect to the public Internet. Authorized technical personnel shall be allowed to remotely access equipment for authorized maintenance/troubleshooting activities in accordance with standard operating procedures or requested technical support. Such remote access must be achieved through a secure connection, e.g. Virtual Private Network (VPN). The PSAP is responsible for providing Digital Subscriber Line (DSL) or other high speed internet connection, unless unavailable.

6.3.4.2 Wireless Connections (M)

The CA 9-1-1 Branch does not recommend the deployment of wireless equipment in PSAP locations, but realizes that operational decisions made locally may prevail in certain applications.

In no instance, shall wireless devices that support headsets, printers, computers or other equipment be provided by the Bidder when degradation of any interconnected system would result in cases where security issues can be demonstrated. Any troubleshooting of any wireless equipment that may be installed by a Bidder shall be subject to agreements made between the PSAP and the vendor, and billed directly to the PSAP and will not be reimbursed by the State.

6.3.4.3 ALI Retrieval (M)

The ANI/ALI equipment shall interface to the designated ALI 9-1-1 database provider(s).

- 1) Each controller shall have at least two (2) interfaces for transmission and receipt of wireless and Voice over Internet Protocol (VoIP) call data to the ALI 9-1-1 database. The proposed system shall have auto ALI rebid capability and shall be configured to allow manual ALI queries. The ANI/ALI equipment shall be compatible with eight (8) and 10 digit remote 9-1-1 database query methods. The system shall also support advanced NENA XML tags for standardized data exchange.
- 2) It shall be the responsibility of each Bidder to contact the designated ALI 9-1-1 database providers to obtain specific connection Requirements.
- 3) ALI 9-1-1 Database Connection – Bidders shall connect their equipment to a Legacy Local Exchange Carrier (LEC) supplied router and NG Gateway, to request data from the ALI 9-1-1 databases. During the transition to NG, PSAPs will have both connections.
- 4) This connection shall be applicable in a Turn-key stand-alone site system.

6.3.4.4 Cabling (M)

Cabling for the proposed system shall be installed by the Bidder, or a subcontractor, that holds a current C-7 license (Low Voltage Systems).

- 1) All cable and wiring will be installed according to the manufacturer's specification to enable equipment to operate as intended with no interference to any other PSAP system. All building and electrical codes applicable to telephone and electrical wiring at the PSAP location shall meet compliance standards;
- 2) All cabling shall be installed in a safe, neat, and professional manner and include any ancillary materials needed;
- 3) Only new cable may be used;
- 4) Aesthetic cable management treatment shall be provided for all exposed equipment cables that are visible in the PSAP;
- 5) Cabling should be run in conduit or cable trays, including through ceilings;

- 6) Cabling shall be run in conduit within walls, and within conduit or cable management hardware on runs where interior access is not available;
- 7) Cabling installed under work surfaces, in modular console systems, or similar shall be run in provided wiring channels, with secured wire looms, or cable management hardware;
- 8) Cables shall be labeled with a unique identifier at both ends of the cable;
- 9) Jacks and keystone jacks shall be marked with unique identifiers;
- 10) Connectors shall be secured to their termination points by appropriate screws, cable ties, Velcro, or other fastening material;
- 11) Any and all cabling that existed to support former systems that are being replaced shall be removed as part of the new installation. This includes cabling under floors, in ceilings, inside wall conduits and in equipment support rooms inclusive of backboards;
- 12) All cabling shall be installed in a tidy and efficient manner to save as much floor and backboard space in applicable areas for later equipment installations;
- 13) Each PSAP will be responsible for facility modifications such as installation of plywood at the demarcation point, installation of conduit and installation of electrical circuits necessary to install a new 9-1-1 CPE System; and
- 14) Include sufficient cabling and repeaters to allow all IWSs to connect to the common electronics at a maximum distance of 500 ft.

6.3.4.5 CPE Interface to Existing Equipment (M)

All CPE equipment provided by the Bidder shall be capable of seamlessly interfacing to standard radio, logging recorder, CAD dispatch and Geographic Information System (GIS) systems available on the market.

Bidder shall permit the use of standard interfaces to 9-1-1 CPE. Any additional software the PSAP needs to incorporate for interagency communications shall not void warranties, contingent upon compatibility and security. Equipment throughout the 9-1-1 CPE shall support secure emergency voice, text and video messaging directly from an IP network and from the Public Switched Telephone Network (PSTN), including the delivery of accurate emergency calling party location information.

6.3.4.6 Remote Data Transfer Interface (M)

The proposed system shall provide a connection for remote data transfer interface, per NENA Standard 04-001, Section 3.9 which adapts to the Legacy use of facsimile machines or the equivalent functionality using newer technologies such as IP.

6.3.4.7 Additional LCD/LED Monitor Interface (M)

The proposed system shall provide, at a minimum, one (1) additional LCD/LED monitor interface with the IWS. This LCD/LED interface shall allow PSAPs to double their viewing capacity by moving certain functions and windows to an additional LCD/LED monitor to view more items at once. Reference NENA 04-501, March 31, 2004, Integrating Applications on IWSs.

6.3.4.8 Trunk and Line Interfaces (M)

The proposed system shall provide an interface to the following line side technologies:

- 1) E 9-1-1 trunks in both Time-Division Multiplexing (TDM) and IP format;
- 2) Ring-down circuits (tip and ring);
- 3) Centrex with Caller ID;
- 4) Trunk Level 1 (T1) and Primary Rate Interface (PRI) with Caller Identification (ID);
- 5) Local control circuits (gates, doors, etc.);
- 6) Local Public Branch Exchange (PBX) systems, IP or Legacy;
- 7) Intercom lines;
- 8) Paging systems.

6.3.4.9 Logging Recorder Interface (M)

A terminal connection shall be provided on the Bidder's Main Distribution Frame in the 9-1-1 equipment room or a location mutually agreed to by the Bidder and the logging recorder contractor, with provisions for termination and interconnection of all voice circuits for distribution to a logging recorder at the PSAP.

The system shall provide trunk-side recording interface for the PSAP. Trunk-side recording allows recording of the emergency calling party before it is answered by the Telecommunicator.

The proposed system logging interface shall meet the minimum Requirements in NENA 04-001, Section 3.5.1. Audio output to the logging recorder shall not have a degraded quality variance as compared to entry point into the proposed system as required in Section 6.3.1.5, Audio Quality.

6.3.4.10 IWS Based Logging Interface (M)

The proposed system logging interface shall be capable of analog and IP IWS based recording, in addition to the trunk-side recording interface.

6.3.4.11 Local Maintenance Terminal Interface (M)

Bidder shall provide a maintenance terminal interface with the following interaction with the E9-1-1 controller:

- 1) Diagnostic mode to display all event, diagnostic, and error messages as they occur;
- 2) Maintenance mode to program and configure the E9-1-1 controller (program interface parameters, assign telephone numbers, reset alarms, generate reports, select options);
- 3) Maintenance mode shall be password protected to ensure system security. The current password shall be either documented locally or shared with PSAP manager in the event a new technician requires access;
- 4) A dedicated maintenance terminal for Moves, Adds and Changes (MACs);

6.3.4.12 Interoperability with a GIS Mapping System (M)

Bidders shall make available the interface for peripheral software to work with the PSAP provided GIS mapping system in accordance to NENA 04-001 or the interface required by the PSAP.

6.3.4.13 CAD and Mapping Interface (M)

Bidders shall provide for serial interfaces or standard IP interfaces for the delivery of call-back and location information to CAD, mapping applications and voice recorders. The system shall also support delivery of Legacy serial ANI/ALI information. Bidder is responsible for obtaining CAD system information, (i.e., pin-out, manufacturer, format) from the PSAP.

6.3.5 CPE Security (M)

Bidders shall provide appropriate security measures to meet the Requirements of NENA Technical Specification 75-001, NENA Security for NG9-1-1 Standard and particularly the Requirements of those sections that address security Requirements of CPE providers, including:

- 1) Section 5.7 Safeguarding electronic information;
- 2) Section 5.9 Safeguarding printed information/material;
- 3) Section 5.10 Sensitive information destruction and sanitization;
- 4) Section 6.1 General responsibilities;
- 5) Section 6.2 Application, system and network administrator responsibilities;
- 6) Section 6.3 Ensuring compliance for recurring security requirements;
- 7) Section 6.4 Network connectivity requirements;
- 8) Section 6.5 Security training;
- 9) Section 6.6 Suspicious activity;
- 10) Section 6.7 General guidelines for design, development, administration, and use of Computer Resource, Network, System or Application;
- 11) Section 7.1 Identification and authentication;
- 12) Section 7.2 Access control;
- 13) Section 7.3 Confidentiality;
- 14) Section 7.4 Integrity;
- 15) Section 8.3 Storage media and output;
- 16) Section 8.7 Data communications networks;
- 17) Section 9.1 Firewalls/security gateways;
- 18) Section 9.3 Extranet and external connectivity;
- 19) Section 9.4 Intrusion detection/prevention;

- 20) Section 9.5 Layer 2 security and separation;
- 21) Section 9.6 Network redundancy and diversity;
- 22) Section 10 Change control and documentation;
- 23) Section 11 Compliance audits and reviews;
- 24) Section 13 Incident response and planning.

All transactions must be protected with authentication, authorization, integrity protection and privacy mechanisms as specified in the NENA STA-010.2 (previously 08-003), NENA Detailed Functional and Interface Standards for the NENA i3, Section 2.2, Security Impacts Summary.

6.4 SYSTEM FEATURES AND FUNCTIONALITY

6.4.1 SYSTEM FEATURES

6.4.1.1 ALI Controller (M)

- 1) A request to the 9-1-1 Database shall be made as soon as the number in the ANI field is detected.
- 2) The proposed system shall interface with the ALI 9-1-1 database by sending ALI retrieval requests from the 9-1-1 interface in the proper format to the host ALI computer.
- 3) The E9-1-1 controller shall compare the number returned with the ALI to the original ANI received, ensuring that emergency calling party ALI matches the ANI.
- 4) The proposed system shall accept a command from a Telecommunicator to repeat the request for ALI from the 9-1-1 database. This is typically used by the Telecommunicator if the received ALI is unclear, incomplete, or dynamic location information needs to be updated.
- 5) The ALI controller must be capable of retrieving ALI data through a Frame Relay circuit and via an IP connection, which will interface with an open architecture router.
- 6) The ALI controller shall be capable of automatic or manual ALI retrieval on one (1) measured-rate business phone line or Centrex lines when the Caller ID is presented with the call on designated telephone lines.

6.4.1.2 ANI/ALI Display (M)

The system ANI/ALI display shall meet the minimum Requirements in NENA 04-001 Section 3.7, as well as the following:

- 1) The system shall have the ability to display ANI/ALI data associated with each E9-1-1 emergency call on IWS or phone set;
- 2) The ANI/ALI display at each IWS shall provide the ability for the Telecommunicator to review at least the last ten ANI/ALI data records for emergency calls that were answered by the Telecommunicator;
- 3) The user shall be able to use the IWS print function to capture the ANI/ALI data to print or save to a file;
- 4) CPE shall accommodate the most current Statewide ALI Format and be configurable for a no cost upgrade for any changes during the term the equipment is installed at the PSAP;
- 5) The ANI/ALI rebid function shall be capable of distinguishing different Classes of Service (COS) needing either automatic or manual operations. The ANI/ALI rebid function shall be capable of both automatic and manual operations and shall be PSAP to accommodate time between rebids and the number of rebids;
- 6) For automatic ANI/ALI rebids, for mobile locations, the system feature shall allow PSAP programmable timers for any combination of COS, the service provider's NENA ID field, as well as the uncertainty and confidence fields; and
- 7) Every ANI/ALI rebid shall provide the information in the CDR XML output for the E9-1-1 emergency call.

6.4.1.3 Dynamic ANI/ALI Output (M)

- 1) The proposed system shall provide a flexible interface capable of sending the information normally displayed with an E9-1-1 emergency call to a CAD, GIS, and other systems. The proposed system shall allow other system devices to interface with emergency call information providing retrieved full dynamic ANI/ALI for every emergency call, as well as IWS identification. The proposed system shall interface with CAD as outlined in NENA 04-001, Section 3.4. The ANI/ALI output shall be a flexible non-proprietary interface that provides data exchange with other systems.

The proposed system shall be capable of fully parsing the ALI response into separate fields based upon XML protocol in the PSAP's CAD, mapping, MIS and other peripherals. If the PSAP has legacy downstream systems that cannot accept XML, the proposed CPE system shall be capable to successfully interface with out-dated hardware and software;

- 2) The ANI/ALI output shall be provided by the proposed system in a NENA Version 4 XML data exchange format consistent with the NENA Technical Standard 20-010, version 8.2. The ANI/ALI output information shall be dynamically provided for each new ALI received, such as a rebid for updated information during the same call. The ALI records being transmitted to other systems shall be capable of being fully parsed in an XML markup for all fields;
- 3) There shall be separate outputs available for the PSAP's CAD, MIS, GIS, plus the Bidder shall include a minimum of four (4) other outputs, if needed by the PSAP. Each output shall be individually selectable and configurable and shall not impede the output to any other devices;
- 4) Flexible output interfaces shall be selectable based upon the PSAP's Requirements such as serial, Transmission Control Protocol (TCP) socket connections, and American Standard Code for Information Interchange (ASCII). The current data dump of the exact 512 byte ALI record shall not be the only way the CPE systems deliver the ALI information to the PSAP CAD and host systems. However, there shall be the option to interface with older ALI record layouts if associated with older systems;
- 5) Flexible interface capabilities shall exist with other systems and include two-way communications capabilities. Socket-based communications with other systems are a necessity, i.e.TCP. The proposed system shall provide a full Application Programming Interface (API) that allows external systems to send/receive requests and data back and forth with the CPE. Example: the agency's CAD or mapping system wanting a refresh of the ALI for the E9-1-1 emergency call that console #XX is currently on, so that an updated location can be displayed, or so that the CAD can append the ALI data into the E9-1-1 emergency call for service being handled by the Telecommunicator; and
- 6) Flexible interfaces shall be configurable on the proposed system so that field-level manipulation such as adding leading zeroes or spaces, padding fields with spaces or specific record terminators, and turning fields on and off can be done as required by

external systems. The ANI/ALI output shall be as required in SOW, Appendix A, Attachment 5.0 Required Call Detail Record (CDR) Elements.

6.4.1.4 ALI Error Reporting (M)

The 9-1-1 CPE software application shall provide the Telecommunicator the ability to systematically capture erroneous ALI information. The error report shall capture all Call Detail Record (CDR) information on paper or in an electronic file for later review and editing.

6.4.1.5 Abandoned Call Detail (M)

In the event the system detects that a 9-1-1 emergency calling party hangs up, after trunk seizure, but before ringing at a Telecommunicator IWS that would have answered the call, the system shall identify in the System Call Status Window the abandoned call ANI and ALI information. This abandoned call detail shall be logged in the CDR.

The system shall be PSAP programmable to provide an immediate automatic call-back of the abandoned emergency calling party. This shall be a choice, since some PSAPs may desire to call back manually. No matter what source the 9-1-1 emergency call is from, the appropriate number shall be put into the Last Number Redial of the associated Telecommunicator answering IWS, which will provide one (1)-step call-back to the abandoned call number. The last number redial function shall accommodate a minimum of 10 digits and be a valid call-back telephone number.

The system shall be tested after install to insure that emergency calls are not internally held up, after trunk seizure, before ringing at a Telecommunicator IWS. From seizure to ring at the IWS, the call shall not exceed two (2) seconds, without ACD or queuing functionality incorporated.

6.4.1.6 Internal Time Synchronization (M)

The proposed system shall include a time synchronization device that provides time standard that is consistent for all components and data (i.e. IWSs and CDR) and meets the minimum Requirements of NENA 04-002 PSAP Master Clock Standard, Version 4.

Accurate time shall be maintained at the controller, as well as each IWS. The time shall be consistent and always available for any Telecommunicator IWS as well as the call

and system data. Ethernet standard time shall also be available for CAD, Radio, and Logging at the remote site.

6.4.1.7 External Source Time Synchronization (M)

The proposed system shall be capable of being time synchronized to an external source if required by the PSAP so time records match those of other devices, such as CAD and logging recorders, when all devices are synchronized to a single time source as outlined in NENA 04-001, Section 3.8.

6.4.1.8 Caller Identification (M)

The proposed system shall be capable of displaying Caller ID on Centrex, one (1) MB, or Primary Rate Interface (PRI) lines when not blocked by the caller.

Proposed systems shall be capable of capturing and permanently storing the Caller ID of previous callers on an electronic storage medium.

6.4.1.9 Wireless ALI-FCC 94-102 – Phase I and Phase II One-button Call-back (M)

The IWS shall present wireless E9-1-1 emergency calls and shall include all standard call-handling features. One (1)-button wireless call-back is Mandatory as the Telecommunicator shall not be required to perform a manual ANI call-back for wireless E9-1-1 emergency calls.

6.4.1.10 Voice over Internet Protocol (VoIP) Capability (M)

All components of the proposed system shall include the functionality and interface capabilities outlined in NENA Technical Standards 08-001 (Interim VoIP Architecture), 08-002 (Functional and Interface Standards for NG9-1-1), and 08-003 (NENA i3). Also, see Section 6.5.1.3 NENA Standards for NG9-1-1.

6.4.1.11 Complete Call Progress Detection (M)

The proposed CPE 9-1-1 System shall be capable of call progress detection and notification throughout the duration of the call. The required call progress states are: Idle (no call active), Ringing (incoming call), Dial Tone, Stutter Dial Tone, Ring Back, Busy, Connected and Disconnected Call. These features shall be provided to the Telecommunicator through audible and/or visual indicators on the IWS. All states of the call shall also be included in the Call Detail Record CDR XML Elements.

6.4.1.12 TDD / TTY (M)

The IWS shall allow Telecommunicators to communicate with TDD/TTY callers directly from their 9-1-1 IWS keyboard, without requiring the use of any external device as required in the system functionality Section for Intelligent Workstation (IWS) Telecommunication Device for the Deaf (TDD)/Teletype (TTY).

PSAPs shall be capable of receiving calls from both Legacy TTYs and Short Message Service (SMS) Text-to-TTY. It is an acceptable alternative to provide separate inputs for Legacy TTY and SMS Text-to-TTY. As it cannot be ensured that all audio calls will transmit a transcoder, the PSAP IWSs will need to recognize Baudot tones and display text, as well as accept typed text and generate Baudot tones on either E9-1-1 emergency calls or 10 digit emergency lines.

The TDD/TTY interface shall comply with the recommendations in NENA 04-001 Section 3.17 with a goal of complying with V.18 modem technology to accommodate Baudot and text messaging.

Bidders shall accommodate Interim SMS Text-to-TTY and Legacy TTY.

6.4.1.13 Multi-Media Requests for Assistance (M)

As part of the evolution of 9-1-1, new call types are inevitable. These new emergency call types include IM, cellular phone SMS texting, multi-media messaging, video messaging and non-human initiated calls (e.g. alarms and vehicle emergency devices). The State intends to be able to handle NENA i3 compliant calls in the future, potentially before national standards are fully adopted. The Bidders proposed system shall supports multi-media calls within 18 months of new standards.

6.4.1.14 Remote Maintenance Access (M)

On-site and off-site personnel shall be able to remotely access the PSAP and be able to perform, at minimum, the following tasks:

- 1) Modify the answering IWSs parameters;
- 2) Modify the user login ID information and permission;
- 3) Modify the 9-1-1 trunk parameters;
- 4) Modify the Central Office (CO) line parameters;

- 5) Modify the ring-down line parameters;
- 6) Assign a module or a port to give the Contractor the ability to:
 - a) View quickly a multitude of system settings for each entity (9-1-1 trunk, user, etc.);
 - b) Reconfigure advanced settings to adapt the system to the exact requirements of a particular setup without technical assistance from the manufacturer;
 - c) Customize the system according to the operational preferences of each PSAP;
 - d) Upgrade the system for new or expanded uses;
 - e) Safeguard the system by backing-up the system database; and
 - f) Troubleshoot the system.

6.4.1.15 System Database Backup (M)

The system shall be capable of exporting a local copy of the configuration, as well as importing the information if the system crashes. For example, operations at the PSAP should not be delayed by reentering speed-dial numbers or other data manually when the system needs to be restored.

6.4.2 CALL AND SYSTEM DETAIL RECORDS

6.4.2.1 CDR Format (M)

The system shall provide all of the specific data elements shown in SOW Appendix A, Statement of Work, Attachment 5.0, Required Call Detail Record (CDR) Elements, CalOES Version 1. As new CDR elements become available (i.e., integrated text), the system shall be updated within six (6) months of the updated required CDR elements document.

The CDR shall be designed to include recursive sub-records for those that occur multiple times for multiple agents on the same call and, most important, multiple ALI records. This is required for all calls and is most applicable to wireless 9-1-1 emergency calls that are rebid.

The CDR information shall be supplied by the 9-1-1 equipment through the CDR serial port in a NENA Version 4 XML Data Exchange format consistent with NENA Technical Standard 02-010. Contractor shall maintain the XML fields to ensure separation of the data, even if the field is blank. All times shall be synchronized with the master 24-hour clock in the form of Hour: Minute: Second (HH:MM:SS).

The CDR files shall be provided for all calls that are managed by the controller including all 9-1-1 and administrative calls.

These CDR Requirements shall apply to a controller located locally at a PSAP or a controller at a remote location in a Host-Remote system.

6.4.2.2 Remote CDR Collection Service (M)

The CA 9-1-1 Branch has developed a statewide Call Detail Record Management & Reports (CDRMR) system that uses CDR output from each CPE controller as the source for data collection.

CDR is collected from each PSAP and sent to an CDRMR buffer box that is then polled by the CDRMR contractor through a dialup connection or other access medium. The information is then collated into reports that can be viewed by authorized users (PSAPs, County Coordinators and the CA 9-1-1 Branch) through secured connections over the Internet. The Bidder will be provided access to CDRMR to view the raw CDR data for diagnostic and maintenance purposes.

Bidder's 9-1-1 CPE shall provide a dedicated serial port from their equipment so that the CDR data is immediately sent to the CDRMR buffer box. The CDR file shall be presented at the end of the call as one data string. Completed CDR files shall be transmitted through the serial port within six (6) seconds following the completion of the call.

On all new system installations, the CDR information must also be capable of interfacing with existing equipment at the PSAP for CAD, mapping and MIS. The CDR data stream must be activated and verified as part of the acceptance process as required in SOW Attachment 4.0 or 4.1, for Acceptance and Authorization Checklist (including Operating System Software). The system shall include four (4) additional individually selectable separate Ethernet outputs for CDR that shall not impede the other outputs.

6.4.2.3 System Detail Records (M)

The system shall provide detail data elements in XML format for the performance of the system such as IWS log-on and log-off, system reboot, power failures, alternate answer conditions, controller failure, remote IWS/PSAP or trunk availability, Host-Remote system availability. Additionally, all data elements the system is storing shall be made available. The system detail data shall be available on a minimum of four (4) secure Ethernet ports.

6.4.2.4 CDR and Quality of Service (QoS) (M)

The system shall provide CDR for all calls including VoIP calls. The system shall provide QoS information, per NENA i3 standards, for each call to ensure that SLAs are being met. QoS information should be accessible through the Bidder's maintenance function.

6.4.3 TURN-KEY SYSTEM FUNCTIONALITY

6.4.3.1 Controller Functionality (M)

The controller for the system shall provide the minimum capabilities outlined below:

- 1) Call Recovery - The controller shall be specifically designed for 9-1-1 and shall not permit calls to be "hung" or lost when connecting to the originally intended call-taker; and
- 2) Switching Technology - The switch shall utilize i3 compliant switching technology.

Audio Signal Processing – Any Coder/Decoder (CODEC) audio signal protocol entering the call controller equipment from direct VoIP Internet Service Providers (ISPs) shall be supported utilizing VoIP CODEC techniques. The system shall attempt to negotiate the use of G.711 to maximize call fidelity. Every converter of Legacy analog or Time Division Multiplexed (TDM) signals to VoIP shall provide automatic adaptive echo cancelation for echo or side tone originating in the Legacy network. The performance of the echo canceling system shall be sufficient to prevent a degradation of voice quality Mean Opinion Score (MOS) from the interface to the Legacy facility through the system to the Telecommunicator.

6.4.3.2 Redundant Architecture (M)

The systems architecture shall consist of a complete ANI/ALI controller system with interface modules to external circuits. The ANI/ALI control functions shall combine into a fully redundant system. The architecture shall conform to NENA i3 standards, as well as Requirements outlined in this document. The system shall be designed as a fully survivable design offering a fault tolerant and secure architecture.

6.4.3.3 Call-Path Associated Signaling (CAS) and Non Call-Path Associated Signaling (NCAS) (M)

The controller shall be compatible with eight (8); 10 and 20-digit ANI delivery, and NCAS solutions.

6.4.3.4 Administrative Line Support (M)

- 1) The controller shall interface with PSAP's administrative lines. All administrative lines having the Caller ID functionality, shall be capable of interfacing with the system to use the call-back number and name information coming with the call.
- 2) Centrex style administrative circuits will be supported with either three (3)-digit or four (4)-digit Centrex functionality.
- 3) Administrative or 10-digit emergency lines as designated by each PSAP may terminate on remote IWSs with Caller ID functionality with name or name and number delivery if supplied by the carrier. Lines terminating on the IWSs cannot appear on a Private Branch Exchange (PBX) or be answered from any other device. The 10-digit emergency lines connected to CDRMR shall be labeled for their specific usage such as alarm and VoIP default.
- 4) Calls needing to be transferred to another internal telephone will be done as an external transfer or using an analog port connected to the agency's PBX.

6.4.3.5 ALI Caching (M)

The system shall be able to store ALI data received from third-party ALI 9-1-1 databases (e.g., telco ALI 9-1-1 database). Within the CPE system, it shall send stored (cached) ALI information in response to subsequent queries for the same information providing faster ALI display on IWSs in the event the call is transferred to another IWS or placed into conference.

6.4.3.6 System Call Format Flexibility (M)

The proposed system shall have the demonstrated ability to effectively manage and process a variety of different call formats including, but not limited to:

- 1) Traditional analog or digital telephone calls;
- 2) Wireless calls in compliance with the FCC Phase 1 and Phase II mandate for full call integration;

- 3) VoIP in native format in compliance with the emerging NENA i3 standard; and
- 4) Telematics.

As NENA standards are developed, the proposed system shall be upgraded to process the call formats including, but not limited to:

- 1) Video;
- 2) Instant Messaging (IM);
- 3) Voice over Instant Messenger (VoIM); and
- 4) SMS, Cellular Text.

Upon new standard publications, the Bidder shall provide a description to the State of how they will upgrade within six (6) months.

6.4.3.7 9-1-1 Emergency Star (*) Codes Transfers (M)

The controller shall provide the capability for an established E9-1-1 emergency call to be transferred by the Telecommunicator to another PSAP using an unlimited number of Star (*) Codes or some other destination compliant with NENA i3 and related standards, if supported by the network.

6.4.3.8 Selective Transfer (M)

The controller shall be able to provide the capacity for access to a minimum of six (6) emergency service providers for each Emergency Service Number (ESN). This capability will allow a Telecommunicator to transfer a call to an agency and establish a conference call.

6.4.3.9 Abandoned Call Information (M)

The controller shall be capable of collecting the ANI digits and processing the ALI lookup regardless of the condition of the call: active or on-hook. The controller shall collect the digits immediately after a trunk seizure event and then process the ALI lookup. The ANI of the abandoned emergency calling party shall be available for viewing by the Telecommunicator and the abandoned call shall remain in queue with still active 9-1-1 emergency calls. However, it shall be possible to sort the calls in queue to meet the Requirements of PSAP protocols. The Telecommunicator shall be able to automatically redial abandoned calls.

6.4.3.10 Automatic CDR (M)

The controller shall capture, and store, all available information pertaining to each 9-1-1 emergency call on the application/telephony virtual server and be accessible to the MIS package for reports.

6.4.4 TELECOMMUNICATOR CALL-TAKING FUNCTIONALITY (M)

The end point Telecommunicator IWSs for the system shall provide the minimum capabilities outlined below whether it is deployed in a Turn-key Stand-Alone system or Host-Remote system.

6.4.4.1 Minimum Telephony Functionality (M)

Telephone functionality shall include the following features:

- 1) Hold;
- 2) Dial;
- 3) Re-dial;
- 4) Release;
- 5) Transfer;
- 6) Conference;
- 7) Speed Dial;
- 8) ALI Request;
- 9) ANI/ALI display (separate display is allowed);
- 10) A minimum of four (4) line appearances;
- 11) 10 multi-function programmable keys or more, programmed as telephone line appearance or a feature of the telephone set;
- 12) Headset/Handset Interface;
- 13) Volume control for inbound audio signal for headset/handset;
- 14) Volume control for outbound signal and sidetone for headset/handset;
- 15) Volume control for the ringer; and
- 16) Call status indication (ringing, answered or on hold).

6.4.4.2 Flash Transfer (M)

The proposed system shall be capable of transmitting a flash hook to the central office to obtain a secondary dial tone for the purpose of transferring the calling party or conferencing a third party.

6.4.4.3 Conferencing Functionality (M)

The proposed system shall be capable of establishing local conferencing consisting of six (6) or more internal and/or external parties (including originator). The system's conferencing functionality shall allow the conference call to continue when the originating calling party disconnects.

6.4.4.4 Distinctive Ringing (M)

The proposed system shall be capable of audible indication of the type of incoming call by using distinctive ring tones for different trunk groups. There shall be a minimum of five (5) distinctive ring tones that can be programmed by the PSAP and are assignable by trunk or trunk group.

6.4.4.5 Call Queuing (M)

The proposed system shall be capable of displaying queue status for at least three (3) different trunk groups. Each queue indicator shall provide visual and audible indicators that calls are waiting to be answered. Alternatively, the Telecommunicator can view the status of individual trunks. The system shall display the status of calls waiting to be answered, calls on hold and calls answered for each trunk. At a minimum, the system shall have call-queuing for all 9-1-1 trunk lines and any associated public safety lines used by the PSAP.

6.4.4.6 Last Stored Number Redial (M)

The proposed system shall be capable of last number redial via one (1)-button feature activation at the discretion of the Telecommunicator.

6.4.4.7 Pre-Arrival ALI (M)

The proposed system shall query the ALI 9-1-1 database as soon as the ANI is presented to the CPE system.

6.4.4.8 Incoming 9-1-1 Emergency Call Display (M)

The proposed system shall be capable of displaying an incoming emergency calling party on a map at a Telecommunicator IWS while it is ringing. The system shall show the address, the cell sector, or Latitude/Longitude (LAT/LON) of the emergency calling party, based upon the COS.

6.4.5 SPEED-DIAL FUNCTIONALITIES

6.4.5.1 Speed Dial (M)

The system shall contain the following speed-dial functionality:

- 1) Be capable of one (1)-button/feature speed-dialing to place calls or transfer callers;
- 2) Include the capability for a minimum of 30 speed-dials with option to increase to more;
- 3) Provide access to speed-dialing via input of two (2) or three (3)-digit speed-dial codes, and by clicking on a visual drop down speed-dial list, that can activate 100 or more pre-programmed speed-dial numbers;
- 4) Allow labels for all the speed-dial codes with names and shall also allow the list to be alphabetized;
- 5) Speed-dial numbers shall be programmable up to 32 digits; and
- 6) Speed-dial numbers shall be user-programmable, under supervisory control.

6.4.5.2 Speed-Dial Contacts (M)

The speed-dial contact functionality shall allow the Telecommunicator to quickly access frequently called telephone numbers from a pre-programmed list of contacts. Preferred example, the Telecommunicator shall simply double click on the contact in order to initiate the speed-dial.

6.4.5.3 Speed-Dial Icons (M)

The Telecommunicator shall have the ability to initiate a speed-dial simply by clicking on an icon which has been preconfigured with the telephone number. It shall be possible to group speed-dial icons in a logical manner. It shall be possible to initiate a speed-dial conference with the single click of a speed-dial icon.

6.4.5.4 Speed-Dial Shortcut Star (*) Codes (M)

The Telecommunicator shall have the ability to transfer 9-1-1 emergency calls and contact other PSAPs utilizing a list for pre-programmed speed-dials, historically referred to as star codes that interface to the Legacy selective routers.

The proposed system shall allow speed-dial transfers to PSAPs that are part of a networked system, known as transferring to PSAPs that are on-net.

The system shall also allow for transfers from a PSAP that is "on-net" to PSAPs that are "off-net". PSAPs that are "off-net" are PSAPs that require transfers to route through Legacy tandems.

6.4.6 ADDITIONAL FUNCTIONALITY

6.4.6.1 Voice Transfer (M)

The proposed system shall be programmable to provide a one (1)-button feature transfer of emergency calling parties to other emergency response agencies based on the incoming ESN. The system shall provide a minimum of 16, one (1)-button tandem transfers. Activation of the one (1)-button transfer feature will dial a tandem programmed speed-dial code to transfer the emergency calling party. For this feature, selection of the agency shall be manually chosen by the Telecommunicator from the system-provided pick list.

6.4.6.2 Ring Volume (M)

The proposed system shall be capable of ring volume adjustment by the Telecommunicator. Telecommunicators shall not be able to deactivate the ringer.

6.4.6.3 Transmit Mute (M)

The proposed system shall be capable of fully muting the Telecommunicators voice transmission while continuing to monitor the emergency calling party on an active call by initiating a one (1)-button feature. Mute shall be at a level that is not discernable (not heard) by the emergency calling party. The mute function shall be switched and not attenuated.

6.4.6.4 Release (M)

The proposed system shall be capable of releasing a line by activating the one (1)-button feature at any time during the call.

6.4.6.5 Radio System Interface (M)

The proposed system shall be capable of using the IWS handset/headset with the radio system under the control of the answering IWS equipment, and the ability to use the radio system headset with the telephone instrument under control of the radio system equipment, as defined in NENA 04-001.

Any 9-1-1 system or associated IWS that is electrically connected to any associated radio dispatch system shall be connected in such a way as to ensure that the interconnection does not degrade the audio heard by any Telecommunicator in any fashion (with hum, noise, level differences, etc.); however, Bidder is not responsible for external radio issues out of their control. Additionally, use of the two (2) interconnected systems shall offer seamless operational capability to the Telecommunicator where no cumbersome operational work-arounds are required to quickly access and/or use either interconnected system quickly.

6.4.7 INTEGRATED RECALL RECORDING

6.4.7.1 Integrated Voice Recording (IVR) (M)

The proposed system shall be capable of recording two-way voice communication of telephone calls at each IWS for the purpose of future playback by the Telecommunicator. Playback shall be accessible on screen via the IWS Graphic User Interface (GUI).

The CDR file elements such as date and time of the call shall be associated with each archived recorded telephone call. The system shall have programmable settings to determine how long voice files will be archived, so as to conserve disk space including the ability to save particular recordings indefinitely, if necessary. The recorder shall be capable of storing a minimum of thirty (30) minutes of telephone conversation.

6.4.7.2 Integrated Recall Recorder (IRR) - Storage (M)

The IRR must be accessible by an easy to use Windows™ or similar interface and must provide a minimum of eight (8) hours of recording time, enough to cover a shift.

6.4.7.3 IRR – Management of Old Recordings (M)

An option to erase all old calls on a timed basis or when the storage space in the Personal Computer (PC) console reaches a certain percentage of full must be provided.

6.4.7.4 IRR – Call Type / Text Information (M)

All recordings must indicate the type of call (9-1-1 or administrative) and allow the Telecommunicator to enter textual information about the call during the call or anytime the recording is accessed. For 9-1-1 emergency calls, the ANI of the emergency calling party must be automatically stored with the call recording.

6.4.7.5 IRR – Separate Recording and Playback (M)

In addition to data captured on logging recorders, the system shall provide at a minimum, separate functionality for recording and playing back all calls for the previous eight (8) hours of operation. Playback functions shall occur within 10 seconds of a minimal number of keystrokes or mouse clicks. For all of the various call types, Bidder shall provide instructions on how to retrieve them.

6.4.7.6 IRR – Controls (M)

The IRR is required to provide Digital Video Recorder-like controls. The Telecommunicator must have the ability to mark and move to any portion of the call.

At a minimum, the IRR must provide the following features: • Play • Pause • Stop • Play forward/fast forward • Rewind • Repeat • Forward file to another IWS • Display ANI • Display Calling Line ID (if available).

6.4.7.7 IRR – Speakers (M)

The IWS must provide two (2) jack boxes and an output port for an interface to an external speaker at the IWS. This must allow the Telecommunicator to playback the IRR to the speaker port, or headset/handset ports.

6.4.7.8 IRR – Radio Channel Recording (M)

The IWS must record the selected one (1) radio channel in addition to the 9-1-1 IWS voice traffic simultaneously.

6.4.8 TDD / TTY Capability (M)

1. The proposed system shall have TDD/TTY capability and be automatically available to all lines that appear at each IWS, e.g., E9-1-1, 10-digit emergency, administrative, and ring-down circuits;
2. Each IWS shall be able to automatically detect TDD/TTY Baudot calls. Each IWS shall have the ability to receive and decode Baudot calls in compliance with current ADA regulations without the need for additional equipment at each IWS as well as originating both Baudot calls from their IWS monitor and scroll the text information;
3. To avoid unnecessary delays in handling TDD/TTY calls, Telecommunicators shall be capable of manually connecting to emergency calls originating from TDD/TTY equipment;
4. The IWS TDD/TTY window shall allow users to store and access (send) a minimum of twenty (20) pre-programmed TDD/TTY messages that the Telecommunicator can transmit to the caller with a single click of the mouse, as well as to print the previous TDD/TTY conversations;
5. The system must provide the ability to print TDD/TTY messages to a system call records printer. Each TDD/TTY call must be clearly labeled as a TDD/TTY call to allow for quick reference when reviewing CDR files; and
6. Additional functionality specifications are as follows:
 - a. The Telecommunicator shall have the ability to create a conference between the TDD/TTY caller and up to four (4) non-TDD/TTY parties either in 9-1-1 call-taking mode or administrative call-taking mode;
 - b. The TDD/TTY function shall allow an Telecommunicator to transfer a TDD/TTY call to another Telecommunicator IWS;
 - c. The TDD/TTY function shall allow the Telecommunicator to alter its operation to comply with Americans with Disabilities Act (ADA) Requirements for Hearing Carry Over (HCO) and Voice Carry Over (VCO) calls; and
 - d. The two (2)-way TDD/TTY conversation and text information shall also be stored on the Application/Telephony Server.

6.4.9 Call/Line Indicators (M)

The IWS shall indicate incoming emergency and non-emergency calls by both audible and visual means. The 9-1-1 trunks shall have a different audible and visual signal from other lines. The IWS shall also have the ability to visually display the status (connected, ringing or on hold) of each emergency and non-emergency call.

6.4.10 System Sounds and Icons (M)

The IWS shall allow a supervisor to modify the system sounds and button icons.

6.4.11 Graphical User Interface (GUI) (M)

The GUI shall allow for personalized screen layout and shall consist of a number of windows, each of which can be located and docked in a location on the IWS screen deemed most optimal by the supervisor.

6.4.12 Help Documents (M)

A user-friendly searchable help file shall be installed on each IWS.

6.4.13 Screen Layout - Lock (M)

The screen layout shall be automatically locked when the Telecommunicator logs into the answering IWS.

6.4.14 Screen Layout - Restore (M)

The supervisor shall have the capability to restore the original screen layout while making modifications.

6.4.15 Printing Capabilities (M)

The IWS shall provide an interface port for manual printing the location, text and TDD/TTY conversation or other media upon call release. It is required that the IWS send print jobs to a network printer.

6.4.16 Status Window (M)

The IWS shall present the Telecommunicator with the status of the following categories:

- 1) Number of Active 9-1-1 emergency calls;
- 2) Number of 9-1-1 emergency calls on Hold;
- 3) Number of 9-1-1 emergency calls Ringing;
- 4) Number of Active Telecommunicators.

The numbers shall be summarized and presented. Telecommunicators shall be able to open up windows for each status category to obtain more information about calls in each category:

- 1) ANI;
- 2) Trunk;
- 3) IWS Position;
- 4) Telecommunicator;
- 5) Start Time.

6.4.17 Automatic Number Identification (ANI) (M)

The IWS shall provide visual display of the emergency calling party's telephone number and any i3 compliant standards.

6.4.18 Automatic Location Identification (ALI) (M)

The IWS shall provide visual display of the emergency calling party's street address information based on Legacy ANI and ALI and any i3 compliant standards. The IWS shall also be capable of extracting geographical coordinate information from the ALI file received and transmitting this information to geographical mapping software with i3 standards.

6.4.19 Call Review (M)

The IWS shall allow the Telecommunicator to view the information of at least the last 10 calls released at the answering IWS.

6.4.20 Instant Messaging (IM) (M)

Instant Messaging (IM) shall be available from each PSAP IWS and be configurable or disabled according to individual PSAP Requirements. Each IWS shall have the ability to send an IM to any other IWS on the system.

6.4.21 ALI Rebid (M)

The IWS shall automatically update location information at regular intervals. This feature shall be configurable by each PSAP as to the number and frequency of intervals on a per wireless provider basis and COS.

6.4.22 ALI Parsing (M)

The IWS shall guarantee that ALI data is appropriately and consistently displayed when interfacing with different ALI providers that send their information in various formats (e.g. wireline versus wireless). The system shall provide a method for formatting the ALI for emergency calls with 20-digit ANI CAS and 10-digit NCAS so the Calling Party Name (CPN) appears in the same location as it does for landline calls. This formatting or normalizing shall provide the CPN to the ANI call-back list for CAS and NCAS calls received.

6.4.23 Conferencing Capabilities (M)

The IWS shall provide the Telecommunicator the ability to remain on a call and add a new party to the conversation without putting the calling party on hold. The calling party must remain on-line at all times. The system shall allow for up to six (6) simultaneous conferences of up to six (6) parties each. Any party shall be able to drop out of the conference; leaving the others talking as long as at least one (1) of the other parties possesses supervision on their connection.

Telecommunicators shall be able to mute any participant in the conference and shall be able to exclude any participant from hearing other parties in the conference to allow for private consultation. The status of the call shall be presented visually in a window that also shows the status of all other calls at the IWS (active, abandoned, on hold).

6.4.24 Call-back (M)

The IWS shall have the ability to call-back an emergency calling party by dialing the ANI received during the E9-1-1 call setup. The IWS shall provide a single feature key to perform this operation. Manual dialing of the number by the Telecommunicator shall not

be necessary. The call-back of emergency TDD and wireless calls should be performed in the same manner.

6.4.25 Hold (M)

The answering IWS shall allow the Telecommunicator to place up to five (5) 9-1-1 emergency or administrative calls on hold with a single keystroke or mouse click. The controller shall store the ANI/ALI information while the call is on hold, hence avoiding repetition of the ALI request.

6.4.26 Forced Disconnect (M)

Telecommunicators shall be capable of releasing an existing E9-1-1 emergency call at any time, regardless of whether the emergency calling party has hung up.

6.4.27 Audio Monitoring (M)

Any authorized Telecommunicator or supervisor shall have the ability to silently listen to another Telecommunicator's telephone conversation from their IWS. Such action shall not cause any audio or visual disturbance at the monitored answering IWS.

6.4.28 Barge In (M)

The IWS shall give the Telecommunicator the ability to barge into an existing call by clicking on the appropriate circuit indicator on their screen or pressing the appropriate line appearance on the telephone. Upon entering any 9-1-1 or administrative call for which ANI/ALI or Caller ID information is available, such information shall be immediately displayed on the Telecommunicator's screen. A minimum of six (6) participants shall be able to use the barge-in feature on a single 9-1-1 emergency call.

6.4.29 Make Busy (M)

Telecommunicators, with appropriate system permissions, shall be capable of temporarily removing themselves from a ring group (call queue) in order to conclude a previous call or perform another task such as radio dispatch while remaining logged on. Telecommunicators shall have the ability to click a single Make Busy icon to remain logged on but not in a queue to receive calls.

6.4.30 Computer Telephony Integration Software Requirements (M)

The screen layout shall be highly customizable. The 9-1-1 client application shall be a true soft phone and operate independent of any associated telephone instrument. If a

fault occurs in the application or PC while a call is active, another Telecommunicator shall be able to take over the call.

6.4.31 Telecommunicator Log-on Roles and Permissions (M)

The system shall require users to manually log-on with a username/password combination. Upon successful completion of the log-on, each Telecommunicator shall be presented with a of minimum of eight (8) pre-configured roles in a drop-down or similar menu. The preconfigured roles shall be definable by the PSAP. The screen layout presented to the Telecommunicator shall be based on a user/role combination. If a role has not been assigned to the Telecommunicator, a default user/default role layout shall be presented. Telecommunicators shall be able to log-on at any IWS and be presented with the identical screen layout associated with the selected role.

6.5 BASIC CPE TURN-KEY CONFIGURATION

6.5.1 Basic CPE Turn-key Defined (M)

Basic Turn-key Configurations are defined as the 9-1-1 emergency call processing system that includes the equipment (preconfigured hardware, software and ancillary materials) as well as the implementation (staging, installation, wiring, testing and training). A one (1) year parts and labor warranty is required to provide the features and functionality below. All computers, monitors and printers must be Energy Star compliant.

6.5.2 Basic CPE Turn-key IWS (M)

Each IWS will include the following in accordance with the requirements of Section 6.3, General System Requirements in the IFB:

- 1) Central Processing Units (CPUs);
 - a) IWS form factor (tower, desktop, laptop or other) to allow for expansion/upgrades;
 - b) Dual core processor, running at minimum 2.5 GHz; with minimum 4MB cache;
 - c) Minimum four (4) GB RAM;
 - d) Graphics adapter with minimum 256 MB non-shared vRAM;
 - e) Video adapter with at least two (2) monitor digital connections, (i.e. DP, HDMI, or DVI);
 - f) Audio capability to meet audio specifications in this IFB;

- g) Four (4) USB-2.0 connectors at IWS;
- 2) Minimum 19" LCD/LED Monitor;
- 3) Mouse;
- 4) Standard Keyboard;
- 5) Programmable Auxiliary Keypad Dialer;
- 6) Phone set (Only if necessary for computer telephony integration);
- 7) Keyboard Arbitrator;
- 8) IRR;
- 9) UPS for IWSs 15 minutes;
- 10) Automatic TDD/TTY capability;
- 11) Configurable setting to enable ACD capability;
- 12) Configurable setting to enable internal text capability.

6.5.3 Basic CPE Turn-key System Requirements (M)

The Basic Turn-key Configuration system will include the following:

- 1) Call processing unit that meets the following Requirements:
 - a) System Physical Requirements;
 - b) Interconnectivity;
 - c) Security;
 - d) System Features;
 - e) Call and System Detail Records;
 - f) System Functionality; and,
 - g) Telephone Functionality.

- 2) Two (2) UPSs capable of providing backup power to all Contractor supplied backroom equipment for fifteen (15) minutes (one (1) is redundant);
- 3) Interface to accommodate the delivery of 9-1-1 with ANI/ALI and administrative calls with Caller ID;
- 4) Capability for third party contractor to collect real time CDR Data via a dial-up connection;
- 5) Cabling from local telephone service provider demarcation point at the PSAP to Bidder's backroom equipment;
- 6) Cabling from backroom equipment to all IWS (up to five-hundred feet (500')); and
- 7) Dynamic ANI/ALI output interface to PSAP provided for CAD, GIS and MIS.

6.5.4 CPE Turn-key Configuration Warranty (M)

One (1) year parts and labor warranty for all equipment, software, features and functionality provided for the Basic Turn-key Configuration must be provided.

6.6 9-1-1 CPE HOST-REMOTE SYSTEM (M)

The 9-1-1 CPE Host-Remote System shall meet all of the mandatory requirements herein 6.6 - 6.8, in addition to the requirements in 6.1 - 6.5.

6.6.1 Host-Remote System: Network Requirements (M)

The network used within the Host-Remote System, between Hosts and between the Host to the Remote PSAPs will be procured the CalOES using CalNET III or similar. The Bidder is responsible for all connectivity within the PSAP from the Bidder's CPE to the IWSs.

6.6.2 Host-Remote Systems General Technical Overview (M)

The system shall be IP based and shall comply with all current NENA i3 standards, by definition IP-based means that the design of the system is such that primary processing of voice communications is accomplished within an IP architecture. Hybrid TDM systems that have IP capability are not acceptable.

The system shall have a minimum of two (2) physical servers each that process calls. Features of the system operation shall provide the minimum functionality as follows:

- 1) In the event of a failure of a server the second server shall automatically assume the load with no loss of service;
- 2) The system shall have a non-blocking, fault-tolerant switching fabric which is expandable;
- 3) Every Legacy interface port shall have resources to detect tones, generate tones and support audio conferencing sufficient to prevent a degradation of voice quality MOS from the interface to the Legacy facility through the system to the Telecommunicator;
- 4) Power to each system shall be delivered to the equipment such that the failure of a single power supply will still allow the redundant systems to function without loss of ability to process calls. The power supplies shall be connected to a UPS capable of supplying power for 15 minutes. The UPS shall be compatible with emergency generators for automatic power loss handling;
- 5) NG-9-1-1 routing service equipment shall be located in at least two (2) geo-diverse secured locations which may include data centers.

6.6.3 Host-Remote System Capability (M)

The system shall be capable of hosting multiple remote PSAPs in multiple jurisdictions. Each PSAP may be composed of a number of remote IWSs plus security appliances necessary to prevent intrusion by unauthorized personnel. Each individual PSAP will require an IP transport network between the remote PSAPs and the system.

There shall be no signal conversion between the host and remote PSAPs, the connection shall be IP end-to-end. It shall be configurable to send real-time (CDR to a printer at any PSAP for any 9-1-1 emergency call that is being handled by that PSAP. Administrative lines shall be capable of terminating at the host or at the remote PSAPs. The IP transport network will be used to backhaul admin line traffic to the host.

6.6.4 NENA i3 Compliance (M)

The Bidder's Host Data Center with Remote end point PSAPs/Telecommunicator IWSs system shall comply with standards as defined in NENA document 08-003 Detailed Functional and Interface Specification for the NENA i3.

6.6.5 Host-Remote System Security (M)

The system shall allow for varying levels of administration and security for: all reconfiguration, monitoring, diagnostic and maintenance activities. Although the different jurisdictions are sharing a common Host-Remote platform, from a PSAP perspective it

shall appear to be a dedicated system. Individual PSAPs/jurisdictions shall not have visibility into the activities of other PSAPs/ jurisdictions.

6.6.6 Host-Remote System Next Generation 9-1-1 (NG9-1-1) Functionality (M)

The system shall not require a fork lift upgrade to deliver NG9-1-1 functionality at any point along the migration path to true NG9-1-1 (Network-of-Networks as envisioned by the United States Department of Transportation [USDOT], NENA and others). The State fully intends to participate as part of a national Emergency Services Internet Protocol Network (ESInet) in the future and requires that the system be compliant with consensus standards of industry associations, regulatory bodies, carriers and vendors.

The Host-Remote System shall:

1. Comply with standards as they emerge within six (6) months for such core NG9-1-1 functions as:
 - a) Emergency Call-Routing Function (ECRF);
 - b) Location Validation Function (LVF);
 - c) Emergency Services Routing Proxy (ESRP);
 - d) Border Control Function (BCF).

6.6.7 Host-Remote System Multi-Media Requests for Assistance (M)

In Addition to Section 6.6, 9-1-1 CPE Host-Remote System, the Host-Remote System shall have the capability for transferring the new multi-media call types.

6.6.8 Host-Remote System Direct Internet Protocol (IP) Calls (M)

The proposed system shall have the capability to terminate native IP telephony (standard Session Initiation Protocol [SIP] call) emergency and administrative calls.

6.6.9 Host-Remote System Network Compatibility (M)

The system, including software, hardware and interconnections, proposed shall be capable to connect to the remote IWSs by various IP transports, such as via T1, Multi-Protocol Label Switching (MPLS), Satellite and VPN. The system shall detect and

compensate for any echo and latency at the remote IWSs within the limitations of the transport technology.

6.6.10 Host-Remote System Service Component Architecture Call-Taking Mode (M)

The system shall have the capability to present inbound 9-1-1 and 10-digit non-emergency calls in a bridged call appearance with at least eight (8) positions (Service Component Architecture [SCA]) mode if desired by a local agency. SCA mode shall display all 9-1-1 emergency and administrative lines on the IWSs and shall cause all IWSs to signal an incoming call with an audible and visual indication. The call shall be delivered to the first Telecommunicator who "answers" the ringing call.

6.6.11 Host-Remote System Overflow Capability (M)

The controller shall allow E9-1-1 emergency calls to be routed to a designated alternate location if all primary location IWSs are busy.

6.6.12 Host-Remote System Remote Maintenance Access (M)

In addition to the requirements in Section 6.4.1.15 Remote Maintenance Access, the Host-Remote System shall be able to perform the maintenance tasks for all PSAPs and host sites.

6.6.13 Host-Remote System CDR and System Detail Records (M)

The Host-Remote System design, in addition to Section 6.4.2 Call and System Detail Records, the CDR shall:

- 1) Be spilled by PSAP or defined group of PSAPs;
- 2) Indicate login data of which physical PSAP Telecommunicators are logged into as well as what PSAP they are logged in as;
- 3) Indicate specific failures by any host site;
- 4) Connect to a minimum of two (2) CDRMR buffer boxes at each host location. For example, if the system has four (4) hosts, then there will be eight (8) CDRMR buffer boxes to connect to.

6.6.14 Host-Remote System Diagram for Orders (M)

The Bidder does not need to provide system diagrams for this IFB; however, at the time of the request for order from the PSAP, a diagram of the proposed Host-Remote System will be required in Microsoft Visio or similar to depict:

- 1) System connectivity;
- 2) Data flow;
- 3) Interconnection Requirements;
- 4) System NG9-1-1 functionality including connectivity to network;
- 5) IWS equipment;
- 6) PC hardware Requirements;
- 7) Interfaces to PSAP auxiliary equipment (i.e. CAD, log recorder);
- 8) Interfaces to any PSAP itemized item ordered; and
- 9) Interfaces to any peripheral equipment ordered.

6.6.15 Host-Remote System Radio Channel Recording (M)

The IRR shall have the ability to record the selected one (1) radio channel in addition to 9-1-1 IWS voice traffic simultaneously.

6.6.16 Host-Remote System Engineering Responsibilities (M)

For the Host-Remote System, Bidder shall perform site surveys and include all of the following, but not limited to all of the following:

- 1) All cabling for connectivity among the controllers;
- 2) All cabling for connectivity to the demarcation point for Centralized Automatic Message Accounting (CAMA) trunk and admin line connections;
- 3) All cabling for connectivity to the ALI source;
- 4) Backup power source needs for each potential host site;
- 5) Climate control needs at each potential host site;

- 6) Space Requirements, security, limited access and fire protection needs at each potential host site;
- 7) Disaster Recovery capabilities;
- 8) Power requirements; and
- 9) Grounding requirements.

6.6.17 Host-Remote System Administration (M)

Administration shall be a Web browser or client application that provides the maintenance functions required for the 9-1-1 specific functions implemented by the controller. These functions include:

- 1) Tandem transfer code configuration;
- 2) Out-going trunk configuration;
- 3) User configuration;
- 4) ALI configuration;
- 5) Resources configuration;
- 6) Services configuration;
- 7) Speed-dial numbers; and
- 8) Agency information.

6.6.18 Host-Remote System Time Synchronization (M)

For Host-Remote systems, in addition to the requirements of Sections 6.4.1.6, Internal Time Synchronization and 6.4.1.7, External Source Time Synchronization, all clocks shall be synced to a common data source.

Accurate time shall be maintained at the Host-Remote controller location, as well as each remote IWS. The time shall be consistent and always available for any IWS as well as the call and system data. Ethernet standard time shall also be available for CAD, Radio, and Logging at the remote site.

6.6.19 Host-Remote Call Controller (Switch) Capabilities (M)

In addition to the controller Requirements defined in Section 6.4.3.1 Controller Functionality, the Bidder shall comply with the following Requirements when proposing a Host-Remote System.

6.6.20 Host-Remote System Geographically Diverse and Redundant Controllers (M)

The Host-Remote System shall support installation in a geo-diverse redundant configuration. The geo-diverse redundant system shall be composed of standalone controllers and be fault tolerant. The Host-Remote System shall be ready to support additional routers for network diversity. The call flow shall be maintained without interruption in the event one controller suffers a Catastrophic Failure.

The Bidder shall work with the PSAP in determining the locations for each Host. The Bidder shall work with the CalOES 9-1-1 Branch to determine optimal network options for the bandwidth and latency requirements providing connectivity, such as, Sonet Ring or MPLS. The central equipment at each Host location shall be fully capable of supporting 100% of all the IWSs. Each Host location shall have local survivability such that if one (1) location becomes completely unavailable due to a catastrophic natural or man-made event, the other locations can continue to process all 9-1-1 emergency calls without intervention from the other unavailable controller.

For the Host-Remote System, the Bidder shall provide the network requirements for the geo-diverse Hosts and the network requirements between all IWSs in order for CalOES to help the PSAP determine the necessary network services to be purchased from CalNET.

6.6.21 Host-Remote System Telecommunicator Log-on (M)

The Host-Remote System log-on data shall, in addition to the requirements in 6.4.31, Telecommunicator Log-on Roles and Permissions indicate which physical PSAP the Telecommunicator is logged in at as well as what PSAP they are logged in as.

6.6.22 Host-Remote System Logging Recorder Interface (M)

The Host-Remote System shall meet all of the requirements in Section 6.3.4.9 Logging Recorder Interface. Trunk-side recording shall be available for all PSAPs within the Host environment and all Telecommunicator IWSs.

6.6.23 Host-Remote System ACD (M)

The Host-Remote System, in addition to Section 6.9.10, 9-1-1 CPE ACD, at a minimum shall provide overflow capabilities that are programmable by the PSAP authorities, to direct their 9-1-1 emergency calls to go to other host locations depending upon, ESN, emergency call-type COS and the availability of other Telecommunicators.

The Host-Remote System ACD shall permit a Telecommunicator logged in at a PSAP other than their own, to receive their calls to the IWS they logged into. In call overflow conditions, the ACD shall be PSAP configurable so that 9-1-1 emergency calls within an ESN shall be able to route to any PSAP, instead of the emergency calling party getting a busy signal.

6.6.24 Host-Remote System MIS (M)

For the Host-Remote System, in addition to Section 6.9.9, 9-1-1 CPE Management Information System (MIS) the MIS CDR output shall also have the ability to indicate calls answered by a PSAP's physical location when IWSs are logged in as a different PSAP.

6.6.25 Host-Remote System Cabling (M)

The Host-Remote System, in addition to all of the requirements in 6.3.4.4, Cabling, shall provide demarks at points specified by the PSAP for host equipment cabling.

6.7 HOST-REMOTE SYSTEM: REMOTE PSAP REQUIREMENTS (M)

6.7.1 Host-Remote System Remote Intelligent Workstations (IWS) Transport (M)

Remote IWS will require an IP transport network between the host controller and the remote IWS and there shall be no signal conversion between the controller and the remote IWS, the connection shall be IP end-to-end.

6.7.2 Host-Remote System Optimal Network Connectivity (M)

The Bidder shall provide the PSAP recommendations and information regarding optimal network connectivity, bandwidth and latency requirement per IWS and additional data or networking equipment not provided by the Bidder, but required at the remote PSAP location or at the host (controller) location to support this function.

6.7.3 Host-Remote System User Profile Mobility (M)

The Bidder shall have a feature that allows access based on user profiles at a remote PSAP. If a PSAP's 9-1-1 trunks are connected to a host, any other PSAP also connected to that host would have those trunks available to them if they use the right profile.

6.7.4 Host-Remote System Computer Aided Dispatch (CAD) and Mapping Interface (M)

In addition to the Turn-key requirements of 6.3.4.13, CAD and Mapping Interface, Host-Remote System interfaces to CAD and mapping shall be individually configurable. The system shall be capable of delivering location information to CAD and mapping applications natively via IP without a hardware or software upgrade being required.

Bidder is responsible for obtaining the CAD interface information from all the PSAPs in the Host-Remote system, as they may not all have the same CAD systems or version.

6.8 HOST-REMOTE SYSTEM: REMOTE PSAP IWS CALL-HANDLING CONFIGURATION AND FUNCTIONALITY (M)

6.8.1 Host-Remote System IWS Software Updates (M)

At log-on, the server shall verify the IWS's software version against its own cached IWS software version. If a newer version of the software exists on the server, the user shall be notified of the update or prompted to upgrade the software which shall then be completed automatically by the server.

6.8.2 Host-Remote System Routing Display (M)

The IWS shall be capable of providing a visual display of the routing status of the call:

- 1) Normal - the first attempt to route the call was successful;
- 2) Overflow - the first route was busy or congested;
- 3) Alternate - the first route attempt failed and another route was attempted;
- 4) Transfer - the call was transferred;
- 5) Not available - no routing status was received.

6.9 ADDITIONAL APPLICATIONS AND PERIPHERALS EQUIPMENT (M)

The Bidder shall provide peripheral applications related to the Telecommunicator call-taking operations that fall outside the scope of CPE Requirements. These applications shall be offered and priced as stand-alone applications or additional functions.

6.9.1 GIS Mapping System (M)

At a minimum, the GIS mapping software will need to provide a means of automatically indicating the location of an emergency calling party, from information in the ALI record. The map shall be capable of using the street address, the latitude and longitude (LAT/LON) of the emergency calling party, and the LAT/LON coordinates of the cell tower and plot the sector in the correct direction. For wireless emergency calling parties, the software will update and track the emergency calling party's location on the map display each time the ALI record is refreshed in the CPE system.

6.9.2 Digital Voice Logging Recorder (DVLR) (M)

Any digital voice logging recorder installed at any PSAP during the lifetime of this contract shall be fully capable of storing any type call or data commonly used in NG9-1-1 systems. In addition, any DVLR installed to support an NG9-1-1 system shall be capable of capturing and storing pertinent data (as Required in this section) in a Host-Remote environment where the device may be shared by multiple PSAPs and may be located at a location that is not local to one (1) or all of them. In such a case, the DVLR shall provide password filters and levels that enable restriction of data access to authorized users on the system as is defined by the users of the system. No DVLR shall be installed that limits logging activities strictly to voice audio captures such as have existed in support of Legacy 9-1-1 systems.

The DVLR shall be capable of recording and processing the following:

- 1) Trunked and conventional radio channels;
- 2) Detrunking Trunked radio calls recorded on a channel basis for proposed system;
- 3) E9-1-1 telephone IWS positions;
- 4) 9-1-1 Telecommunicator voice traffic;
- 5) Admin/PSTN/VOIP telephone lines;
- 6) Console select and unselect audio;
- 7) General 2 and 4 wire audio circuits; and
- 8) Trunk-side recording (before the call is answered).

The system architecture shall be such that the failure of one component or module will not result in loss of audio collection or storage. All critical system modules shall be protected through the use of redundant modules to ensure single point failure tolerance.

The system shall have a hot standby operation on vital modules such that upon the failure of any of those modules, the system shall automatically switch-over or utilize the back-up module. The failure of any component shall not cause the loss of any audio from any analog port. It is understood the non-redundant digital port audio collection may be an exception to this Requirement. The installation shall include the required hardware, software, training, cabling and any materials necessary for install.

6.9.3 External Time Source (M)

An external time source proposed by the Bidder shall be capable of functioning as outlined in NENA 04-001, Section 3.8. The external time source shall support a minimum of four (4) synchronized outputs, so time records match those of other devices, such as CAD, MIS, and logging recorders.

6.9.4 Real-Time Call Status - System (M)

The Bidder shall provide a Real-Time Call Status - System for 9-1-1 calls processed through the CPE. The System (hardware and software) shall provide data for the actual 9-1-1 call activity, answer time, hold time, other factors, and clearly represent the real-time condition of 9-1-1 within specified level of the user. The System shall provide multiple outputs for an external display which may be as large as 70" diagonal at 4K x 2K.

6.9.5 Real-Time Call Status - Display (M)

The Bidder shall provide, at a minimum, a 55" diagonal display monitor with a wall mount for displaying the real-time call status information. The display shall receive the input from the Real-Time Call Status - System.

6.9.6 Internal SMS Text Activation (M)

The Bidder shall provide SMS text functionality internal to the CPE System for the PSAP with activation. Each IWS shall receive and display text calls per the PSAPs configuration for various telecommunicator log-ons.

6.9.7 Call-Taker Headsets (M)

Bidder shall provide a call-taker headset compatible with the IWS in the Bidder's CPE System.

6.9.8 IP Phone Set (M)

Bidder shall provide IP Phone Set(s) to work directly with the proposed 9-1-1 CPE, with similar capabilities of an IWS with the ANI/ALI and any necessary licenses to provide the CDR and CAD outputs as well as external recording, for possible cases when a PSAP does not need a full IWS.

6.9.9 9-1-1 CPE Management Information System (MIS) (M)

The Bidder shall offer a 9-1-1 CPE MIS System with the following Requirements:

6.9.9.1 MIS Applicability (M)

The Bidder's MIS capability shall apply to a Turn-key stand-alone CPE system.

6.9.9.2 MIS Reporting (M)

The Bidder shall provide a comprehensive management and statistical reporting functionality to the PSAP management personnel with real-time and historical information. It shall be customizable and capable for generating reports for varying time periods. The system also shall be able to auto-schedule the generation of predefined reports.

6.9.9.3 MIS Data Compatibility (M)

Reports shall be exportable in the standard Microsoft Excel formats (.xls and .xlsx) allowing for sorting and data manipulation. If the lines of data are truncated using an older format of Microsoft Excel, then the export shall be sequentially numbered in separate files.

6.9.9.4 MIS Reporting Requirements (M)

1. Bidders shall offer a MIS summary report that provides information on the following:
 - a. Number of total calls received;
 - b. Number of abandoned calls;
 - c. Number of calls on a per trunk basis;
 - d. Number of calls on a call type basis;
 - e. Number of calls transferred;
 - f. Number of calls on a per IWS basis;
 - g. Average time to answer;
 - h. Average length of call;
 - i. Average hold time.
2. The MIS system shall provide a means of creating ad hoc reports from the CDR and non 9-1-1 emergency call information. The system shall be flexible to allow a PSAP manager to produce ad hoc reports on an as needed basis on a per-shift, per Telecommunicator, and per hour, day, week or month. The following information shall be readily available for reporting purposes:
 - a. ANI/ALI/Location Information;
 - b. Seizure time;
 - c. IWS Position answered;
 - d. Answer time;

- e. Disconnect time;
- f. Incoming trunk number;
- g. Total count of call type(s) such as but not limited to wireline, wireless, VoIP call types;
- h. Average call-waiting;
- i. Average call duration;
- j. Total hold time per call;
- k. Average amount of time calls are on hold;
- l. Duration of transferred calls;
- m. Number of calls transferred to/from each PSAP;
- n. Total number of times an emergency calling party is transferred and to which PSAP(s);
- o. Total abandoned calls;
- p. Calls by incoming trunk;
- q. Call by hour of day;
- r. Calls answered by IWS position;
- s. Calls answered by all IWS positions;
- t. Calls answered by each PSAP;
- u. Call answered by user ID;
- v. Agent Statistics (log on/off workstation, log on/off queue, ready/not ready, on/off hold).

3. In addition to the above, ANI/ALI location information and other information, as i3 standards are developed, shall be captured and stored with each 9-1-1 emergency call. The following items from the ANI/ALI data stream shall be captured and stored in their own individual database fields of appropriate size that are sortable, searchable and, as i3 standards are implemented, that have the ability to capture and to comply with i3 standards:
 - a. Originating phone number (ANI);
 - b. Address or coordinate (ALI);
 - c. Emergency calling party name;
 - d. ANI/ALI time of Initiation;
 - e. ANI/ALI time of pickup;
 - f. ANI/ALI time of disconnect;
 - g. ANI/ALI date;
 - h. ESN;
 - i. Class of service;
 - j. Carrier;
 - k. Number of rebids for location.

6.9.9.5 MIS Report Customization (M)

The report manager shall be able to customize and then save customized reports for quick access, such as a browser type favorite for execution.

6.9.9.6 MIS Time Zone for Reports (M)

Any reports generated from the MIS system as outlined in this section shall allow the user to configure which time zone is displayed, printed, or output to file for any data element with a time stamp.

Automatically generated reports shall allow a Telecommunicator to set which time zone time is shown for data elements containing time stamps.

6.9.10 9-1-1 CPE Automatic Call Distribution (ACD) (M)

6.9.10.1 ACD Functionality (M)

ACD functionality is not a component of a Basic Turn-key Configuration. Bidders shall provide ACD systems that meet the minimum requirements below that will function within, internally, their proposed CPE systems.

The ACD system shall help evenly distribute the workload at a PSAP by sending calls to the Telecommunicator who has been idle the longest when a call arrives. This means that a new call will only ring at a single IWS, starting with the longest-idled Telecommunicator. (There are overflow conditions that might result in having the call ring at several IWSs). For a busy PSAP with all Telecommunicators busy, this means that as soon as a Telecommunicator becomes available then he or she will be given the highest priority for longest ringing call.

ACD systems shall meet the NENA Generic Requirements for 9-1-1 PSAP Equipment 04-001, Issue 2 and the minimum ACD functions listed in the following requirements, 6.9.10.2 – 6.9.10.10.

6.9.10.2 ACD Queuing (M)

In an ACD environment, it shall be possible to establish separate queues to allow the isolation of 9-1-1 emergency calls in a queue for priority answer. Each Telecommunicator shall have queue control, so that they can put a call on hold to answer additional calls. The ACD shall provide a minimum of four (4) queues.

A Telecommunicator shall be able to log into multiple queues. For example, a Telecommunicator shall be able to log into the 9-1-1 queue while trainees are logged into a lower priority queue, e.g. 10 digit non-emergency lines.

Queue control shall be established with a single button or mouse click operation. For example, if Telecommunicators are busy with 9-1-1 emergency calls and a supervisor wants to answer one of the lower priority queues, then they shall be able to press/click a single button to take the next call in the lower priority queue.

Queuing shall support different priority levels. For example, if two (2) queues are set up, one (1) for non-emergency calls and one (1) for 9-1-1 emergency calls, the 9-1-1 queue shall take priority. In this example, the non-emergency queue shall support call stacking as long as there are 9-1-1 emergency calls in the emergency queue. As soon as the 9-1-1 queue clears out, then a non-emergency call drops to the next available

Telecommunicator. If another 9-1-1 emergency call comes in, the next available Telecommunicator then gets the 9-1-1 emergency calls and non-emergency calls continue to wait.

6.9.10.3 ACD Ready/Not Ready (M)

Telecommunicators shall have the ability to enable or disable their IWS from taking calls with a single button press or mouse click.

6.9.10.4 ACD Ringing (M)

Distinctive ring or distinctive zip tones based on call queues shall be supported in an ACD environment to differentiate 9-1-1 emergency calls from non-emergency or administrative type calls. Regardless of whether the system uses user-controlled answer or forced-answer (zip tone), the system shall include the option of producing ringing only to the headset, except when the Telecommunicator's headset is unplugged. This helps keep a quiet environment in the PSAP.

When a call is distributed to a ready IWS, it will ring and if not answered within a predetermined time (Ring-No-Answer [RNA]), a supervisor alert shall be generated and the call re-queued. Optionally, the IWS should automatically be made not-ready so that when the call is re-queued, the IWS is no longer a candidate for re-distribution. If no other IWSs are ready, then an overflow condition occurs, forcing other users to be aware of the condition.

The CDR XML output shall include the original queue information and subsequent queue information if the call returns to the queue.

6.9.10.5 ACD Hold (M)

Telecommunicators shall have the ability to place an unlimited number of calls on Hold during ACD operation in order to receive any other incoming call. Holding a call or retrieving a held call shall be accomplished using a single keystroke/mouse click. When a 9-1-1 emergency call is retrieved from hold, ANI and ALI information shall be automatically displayed to the Telecommunicator.

Any Telecommunicator shall have the ability to retrieve a call from Hold. Held calls shall be able to remain on hold indefinitely, or re-queued after a predefined length of time. It shall be possible to view the status of held calls and the length of time in Hold status from any Telecommunicator IWS.

All Hold information of the call in one (1) or multiple times shall be reported in the CDR XML output.

6.9.10.6 ACD Overflow (M)

Overflow occurs when a new call arrives in a queue and all IWSs enabled for that queue are not-ready. In an overflow condition the ACD system shall 1) ring a queue specific chime or 2) re-queue the call to a different, specified queue. In either case, the system shall also be able to specify that if ringing occurs for more than the RNA timeout, the call

will be re-queued to a different specific queue. It shall be possible to specify any queue as an overflow queue. Each queue could have a different overflow queue, or all queues could use a common overflow queue.

The system shall also include the ability for the PSAP to configure the chime source for each queue. The source device options shall include either an electronic reader board speaker, or a specified output relay. If the source is an electronic reader board speaker, the system shall be able to select a unique sound for each queue. Each queue shall be able to use a unique output, or several queues may specify the same output.

6.9.10.7 ACD Announcements (M)

A preprogrammed announcement shall be played back to the incoming calling parties waiting in queue when all logged in Telecommunicators are in a busy state. The ACD shall also provide skills based routing depending on a caller's selections. The ACD announcement shall be PSAP programmable. For example, the PSAP may want to direct a 9-1-1 emergency call to a specific foreign-speaking Telecommunicator.

6.9.10.8 ACD Trunk or Line Access (M)

Telecommunicator IWSs shall have the ability to access any and all 9-1-1 trunks or lines from any IWS in an ACD environment.

6.9.10.9 ACD Log-in (M)

Each user shall have a unique log-in ID for answering different queues. Supervisors shall have the ability to reassign queue membership of any logged-on user in real-time without the user having to log-in under a different ID.

6.9.10.10 TDD / TTY Considerations in an ACD Environment (M)

The TDD/TTY capability shall be provided in an ACD environment in compliance with NENA 04-001, Issue 2, Section 5.18.3. Basic CPE Turn-key system. Also, the ACD shall be programmable with an internal text function, not OTT, when connected via a gateway.