NENA
Technical Information
Document
on
Future 9-1-1 Models

Prepared by:
National Emergency Number Association (NENA)
Future Models Study Group of
Network Technical Committee

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1. INTRODUCTION

1.1 Purpose

1.1.1. To develop models of 9-1-1 systems that will provide the features and functionalities that the public safety organizations need to do their job of responding to 9-1-1 calls. The models have been developed with a view to the future in that each model represents either a view of what currently exists or what is expected to exist at a pre-defined point in the future.

1.1.2 Scope

The scope of this document is limited to which a function or feature meets at least one of the following criteria:

1.1.2.1 Provides information about the person or source of the 9-1-1 call.

1.1.2.2 Provides the caller's location

1.1.2.3 Identifies the emergency, including allowing for interfaces to receive that emergency data from specific systems.

1.1.2.4 Provides the telecommunicator information on what and how to dispatch.

1.1.2.5 Describes equipment performance features

1.1.2. These models do not represent component design, but provide the framework within which the other NENA committees can design and develop recommendations and standards.

1.2 Benefits

These Models serve to provide functions and features to:

1.2.1. <u>Vendors</u> to inform them as to what products and services they should be planning.

1.2.2. <u>Customers</u> to inform them as to what the equipment that they order or plan to order should be capable of performing.

1.2.3. <u>NENA Committees</u> to provide guidance on what recommended standards should be developed.

1.3   Overview

1.3.1   <u>Driving concept</u>: For decision makers to plan, they need to not only know what exists and what is coming in the future, but also <u>to know when</u> a certain feature or function will arrive. Thus this Technical Information Document consists of models by timeline. That is, it shows is currently available for purchase, then in subsequent models what member of the Future Model Study Group (that created this report) expects will or should be provided for purchase at later dates<u>.</u>

1.3.2. <u>Basis for the models</u>: The basis for all the models is a "Master Model" that lists all current and likely future features and functions. From this Master Model was created a "Current Model" selecting just those features and functions that are currently available. Then from the Master Model are taken those features and functions that are expected to be available in the coming 12 months and have created the "Coming This Year" model, and so on for each of the subsequent models.

1.3.3. <u>Color Coding</u>: Because it is important to be able to see from the Master Model where each timeline model took its features and functions, the appropriate text is color coded. The timeline models are listed below. The colors assigned are those used in the Master Model to show which feature/function went to which model.

1.3.3.1. <u>Current Model</u> – A list of all currently available, standard features. This provides a basic understanding of what a typical 9-1-1 system should have. This is the section labeled "4.1."

   Assigned color for Current Model: black.

1.3.3.2. <u>Coming This Year</u> – A model of what new features are new within the last few months and are either just available for purchase or are being rolled out for sale within the next 12 months.   The concept here is to provide a list of "What I should plan to consider for purchase" for potential customer use. Of course, vendors may use this to ensure they are keeping up with the competition.   This is the section labeled "4.2."

   Coming This Year – red (as in "red indicates action now")

1.3.3.3. <u>Near Term</u> – A model of what is expected to be available within the next three years. This will guide product managers and market planners. This is labeled "4.3."

Near Term – green (a good readable color that is between red and blue)

1.3.3.4. <u>Five-Year Horizon</u> – A model of what may be available in five or more years. This should be used by strategic planners and design engineers to develop solutions to meet these concepts. This is labeled "4.4."

Five-Year Horizon – blue (as in "blue sky idea")

Parenthetical notes have been inserted by some entries to explain its context or why a specific time was selected. These notes are in black italics.

2. COPYRIGHT AND RESPONSIBILITY

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Billy Ragsdale
NENA Technical Committee Chair and Liaison
404 329-4146

Or

Bob Gojanovich
NENA NetworkTechnical Committee Chair
732 743-6366

3. ACRONYMS AND TERMS

Standard 9-1-1 industry term may be found in the <u>NENA Master Glossary of 9-1-1 Terminology</u> at

http://www.nena9-1-1.org/pub/Standards/NENAMG.PDF

Where a term is not in this glossary, it is provided with a little detail to provide clarification.

4. MODELS

4.1. Master 9-1-1 Model

This model is color-coded to show to which current or future model each feature or function belongs. See paragraph 1.3.3 above for codes. The following are features and functions of the Master 9-1-1 Model:

4.1.1. System is accessed via "9-1-1" dialed by caller.

4.1.1.1 Should be touch tone-generated numbers (i.e., DTMF).

4.1.1.2 No other numbers should be used (e.g., *9, 7-digit) as determined by the *Wireless Communications and Public Safety Act of 1999*.

4.1.2 9-1-1 Network

4.1.2.1 Calls are processed by a 9-1-1 Network that has special features required to allow routing based on pre-established criteria and control by PSAP personnel. *This does not pre-suppose that it is a CAMA-type, ISDN or Internet network, just states the concept. The first rule of call management is to keep calls within the network where known features can be used to manage the calls.*

4.1.2.2 Calls from non-public emergency response systems, including alarm system organizations, at the option of the 9-1-1 authority, arrive on the system with full capability of call management equal to that of a dialed 9-1-1 call. *Canada already has this for Operator Services.*

4.1.3 Enable TTY/TDD communication.

4.1.3.1 Be able to pass voice and Baudot tones.

4.1.3.2 Be able to process ASCII TTY/TDD.

4.1.3.3 Be able to pass typed messages via faster, more sophisticated method (next generation).

4.1.4   Transfer 9-1-1 calls to a PSAP that is responsible for the caller's location where the call will be answered.

4.1.5   Provide information describing the caller's location in industry-approved format to an accuracy defined in terms of meters:

4.1.5.1   For landline calls, including users behind PBXs (including street address and/or location relevant to the PBX).

4.1.5.2   For wireless calls (where the phone is mobile). *This means only in most general terms such as Wireless 9-1-1 Phase I and Phase II.*

4.1.5.3   For wireless calls that have some connectivity to a fixed geographical location (such as wireless local loop)

4.1.6   Ability to send personal information over the phone (A caller's data would be available based on some user identification such as social security number or SmartCard ID.) *This is only the ability to send, a different aspect than a PSAP call taker's ability to retrieve. This concept does not preclude the possibility that a PSAP call taker would have the ability to block that information if the call taker did not need it.*

4.1.7   For landline calls, the ability to connect the call to the appropriate PSAP within 1.2 seconds of the last digit being dialed.

4.1.8   Enable transfers of the call with ALI to:

4.1.8.1   Another position within the PSAP

4.1.8.2   A different PSAP connected to the same selective router

4.1.8.3   A different PSAP connected via:

4.1.8.3.1   Non-traditional selective routing, such as via Intelligent Network.

4.1.8.3.2   A different selective router (supposing a common interface protocol so that all selective routers, regardless of manufacturer, would be able to transmit and receive the information, preferably via the PSTN). This would transfer the ANI, but still require the second PSAP to dip for the ALI, which would be available to that PSAP. *Current transfers to different selective routers don't allow for the PSAPs to dip into the ALI that is available to the first PSAP.*

4.1.8.4   Interface a Computer-Aided Dispatch and/or Record Management System

4.1.8.5   Interface a mobile data terminal

4.1.8.6   Interface other emergency services, such as a poison control center. *This is currently done in Texas.*

4.1.8.7   A PSAP that is out of local area (e.g., across country, to Canada, to Mexico, to the world)

4.1.9   Have the following ALI features: *This is for "automatically" delivered info only. There is a separate section for Location Information that is recommended as discretionary.*

4.1.9.1   ALI record is based on the subscriber's telephone number or profile number

4.1.9.2   NENA company ID code

4.1.9.3   Line category:

4.1.9.3.1   Class of Service code (whether residential, business, etc.)

4.1.9.3.2   Whether Foreign Exchange or Wireless

4.1.9.4   Address/Location Information:

4.1.9.4.1   For landline, provide:

4.1.9.4.1.1   Street address with sub-location (floor and room/cubicle, etc.) where necessary to direct response without delay.

4.1.9.4.1.2   Latitude, longitude and altitude (above sea level) or elevation (above ground)

4.1.9.4.1.3   Map Grid coordinates (for PSAPs that use local maps for dispatch). *There is some discussion that this should not be automatically provided as some locations generate this locally.*

4.1.9.4.1.4   Person's secondary number, such as a cellular phone as a lookup

4.1.9.4.2   For cellular wireless (including PCS and GSM), provide:

4.1.9.4.2.1   Cell Tower's latitude, longitude, address and description of cell sector radio coverage.

4.1.9.4.2.2   Dynamic update of information on the cell sector that has the call so that if the caller moves to another sector, this can be updated to always be current

4.1.9.4.2.3   Mobile Phone's:

4.1.9.4.2.3.1   latitude, longitude, altitude (above sea level) or elevation (above ground) and confidence factor.

4.1.9.4.2.3.2   velocity and direction.

4.1.9.4.2.3.3   map grid coordinates (for PSAPs that use local maps for dispatch). *There is some discussion that this should not be automatically provided as some locations generate this locally.*

4.1.9.4.2.4   Subscriber's address (but with obvious designation that this is a "home" address, not the location from which the call is being made.)

4.1.9.4.2.5   Location updated on demand by the PSAP.

4.1.9.4.3   For wireless calls that are restricted in movement:

4.1.9.4.3.1   The above list for wireless (less ALI location update if caller moves)

4.1.9.4.3.2   Address information that informs the call taker that the phone is restricted to a geographic location or area (e.g., wireless local loop)

4.1.9.5   Have a lookup capability to a supplementary database that provides the logical addresses of each record thus defining the telecommunications service provider and ALI database service provider. This would enable PSAPs to determine the source of a record with an error where those company IDs are not available from the ALI display. It could be used for ALI Steering and to determine if the number has been ported.

4.1.9.6   Ability to do ALI Steering with the following:

4.1.9.6.1   The routing of an ALI request to the appropriate ALI database service company based on the ANI, pANI, ESRD or ESRK that is received by the PSAP or local ALI database provider.

4.1.9.6.2   The exchange of 9-1-1 ALI database information among Competitive Database Providers. *This is becoming critical as Local Number Portability (LNP) expands into the next set of Metropolitan Statistical Areas (MSAs) and we move toward Geographic Portability (GP).*

4.1.10. Call Information On-Demand. Establish PSAP and 9-1-1 Network capabilities to know what additional information is available about the 9-1-1 caller and the emergency, so that at the PSAP call-taker's command, this information would be retrieved. *This is the pre-established data path to provide this information, not the verbally communicated data, which is currently available.*

4.1.10.1 Automatic Collision Notification data: *This is available today only verbally.*

4.1.10.1.1 Airbag deployment

4.1.10.1.2 Location information by Latitude and Longitude.

4.1.10.1.3 Automatic opening of a microphone and receiver in the vehicle to allow two-way conversation with either PSAP or third-party service provider that could patch call to the appropriate PSAP.

4.1.10.1.4 Number of passengers in vehicle and each person's weight by seat occupied

4.1.10.1.5 Data previously provided by the vehicle owner(s) for storage with the ACN company to be made available when necessary.

4.1.10.1.6 Delta (i.e., change in) velocity and principal direction of force.

4.1.10.1.7 Orientation of vehicle at time of collision and after collision, and whether the vehicle rolled.

4.1.10.2   Health Monitors that report condition of patient

4.1.10.3   Highway Condition information to keep map displays current

4.1.10.4   Personal Health data from insurance companies or person's doctor. May be just the location of the person's medical records.

4.1.10.5   The driver's "smart card." A smart card would have a person's personal data that is recorded on an EPROM or magnetic strip. The driver would insert his smart card into a read slot in the vehicle. Should the vehicle become involved in a collision, this would enable pertinent medical data to be sent to the ACN center, which could then forward it to emergency medical personnel.

4.1.11   Seamlessly integrate external data with ALI. System automatically takes information from outside the 9-1-1 system and provides hyperlink-type integration (See new Internet XML format.). *This refers to the automated transmission of the data, not the providing of it via a person at the Automatic Collision Notification (ACN) center talking to a PSAP call-taker.*

4.1.11.1   Automatic Collision Notification data. *See 4.1.10.1 for list.*

4.1.11.2   Health Monitors that report condition of patient

4.1.11.3   Highway condition information to keep map displays current

4.1.12   Ability of the alarm company connectivity to enable the PSAP call-taker to speak back through the alarm company's circuits/radio path to the scene of the emergency. *By eliminating the need for an alarm company representative to relay messages, the ability*

of the PSAP to send the most appropriate help faster is improved.

4.1.13   Allow for creation and update of ALI with inputs from:

4.1.13.1   Wireline carriers to database management system to PSAP ALI controller

4.1.13.2   Wireless carriers to Database Management System or local PSAP ALI controller

4.1.13.3   PSAP administrators (and authorized telecomunicators)

4.1.13.4   PBX service providers, where the PBX provides enhanced 9-1-1.

4.1.14   Map display of the caller's location.

4.1.14.1 Basic initial information about the caller's location:

4.1.14.1.1   Appropriate symbol to mark the location (perhaps a circle that defines the circular error probability)

4.1.14.1.2   Speed and direction, if system requests it

4.1.14.1.3   Add company code of the local street map publisher to the map for those Emergency Response Units that do not have a map display in their vehicle.

4.1.14.2 Update abilities:

4.1.14.2.1   Update upon manual request

4.1.14.2.2   Periodic update based on time set by call-taker (e.g., update every 10 seconds, every minute, every five minutes)

4.1.15   Call history maintained for follow-up and employee development

4.1.15.1   Time and date of last few calls

4.1.15.2   Incident

4.1.15.3   Call taker's ID

4.1.15.4   Results of call

4.1.16   Ability to know a third party that should be notified concerning the 9-1-1 caller's emergency. This third party could be a parent, a spouse, an organization, etc.

4.1.17   PSAP Position Mobility.

4.1.17.1   Remote Access: Enable a set of telecommunications equipment (that comprises a PSAP or PSAP position) to be set up almost anywhere and dial into a port to enable the PSAP to operate away from a fixed location.

4.1.17.2   Wireless PSAP: Have the positions communicate via radio. This would use radio for the full range of equipment and systems used by a Telecommunicator at a PSAP: voice, ANI, ALI, CAD, etc.

4.1.18   Data Transfer. Ability to transfer categories of info, such as name, address, remarks section, call history, personal profile, building floorplans, etc.

4.1.19   PSAP Automation:

4.1.19.1   Dynamic PSAP. Enable additional PSAP positions to be activated when required upon supervisor's request. Example: Call takers who are working on admin lines at a PSAP position or at home could be contacted and requested to come online as an additional PSAP position.

4.1.19.2   Robotic PSAP. Enable basic or initial PSAP functions, such as call-answering with ALI display to be handled in an automated process. Perhaps use voice recognition to do some tasks.

4.1.20   Congestion control of 9-1-1 trunks:

4.1.20.1   Establish congestion control that can be set and changed (examples: Spike Masking and simulated facility groups (SFGs)).

4.1.20.2   Provide automatic notification to PSAP when congestion control has been enabled (i.e., calls are being blocked)

4.1.20.3   Enable manual changing of congestion choke points by PSAP *This is listed for the five-year model owing to the need to resolve liability issues.*

4.1.20.4   Provide for dynamic management of congestion control via a graphic interface that impacts all carriers providing service in geographic zones.

4.1.21   Have alternate routing for calls blocked by full trunks or trunk failures. Have a catastrophe procedure to divert all 9-1-1 calls should a PSAP fail.

4.1.22   9-1-1 Priority: Where 9-1-1 calls are not transported over a dedicated network (such as a mobile radio system) the system would have a priority handling capability for the 9-1-1 calls. Integrate with other priority programs, such as Cellular Priority Access Service (CPAS) and Telephone Service Priority (which is a service restoral priority versus call-delivery)

4.1.23   Provide real-time messaging between positions at a PSAP. Examples of use: maintenance, instructions to call takers from shift supervisors.

4.1.24   Allow 9-1-1 call takers to accept non-9-1-1 calls: administrative calls, 3-1-1 calls (transferred from 3-1-1 call taker), TTY relay services, identify test calls, etc.

4.1.25   Enable administrative calls (i.e., calls received on the admin number and inter-telecommunicator calls) to be transferred with data, including notes entered by the call taker. *The reverse is available to 9-1-1 systems (i.e., in an ACD system, the 9-1-1 calls can be routed to the non-emergency queue when all 9-1-1 call takers are busy. The ALI is also transferred.)*

4.1.26   Third Party, Private Emergency Notification: Automatic Collision Notification, panic alarms, health monitor alarms, etc. Allow PSAPs to receive calls and data sent by automatic collision notification systems and other private monitoring services, although this may have to go through a service bureau first.

4.1.26.1   Provide prior to call answer

4.1.26.2   Provide subsequent to call answer upon command from PSAP call taker

4.1.27   Establish dedicated NXX for PSAPs (e.g., 9-1-1) so that calls could be transferred out of the area to a PSAP via public switched telephone network. *5-1-1 and 7-1-1 are being used in some locations.*

4.1.28   Call Hold and Ringback (Canadian and New Jersey requirement for wireline)

4.1.29   Abandoned call treatment: Enable the PSAP to capture information about calls attempted.

4.1.30   PSAP to have alternate telephone numbers so that outside official parties can contact them, such as would be the case where 9-1-1 calls are transferred from out of the region. These circuits would allow the receipt of data with the voice call.

4.1.31   Dynamic ALI Updates: Enable all certificated telecommunications carriers to have real-time updates to the ALI database when a person signs up for service.

4.1.32   Secure IP Network: Have a dedicated secure network as the IP network for carriers.

- - - END OF MASTER MODEL - - -

4.2 Current 9-1-1 Model

4.2.1   System is accessed via "9-1-1" dialed by caller using touch tone-generated numbers (i.e., DTMF).

4.2.2   9-1-1 Network: Calls are processed by a 9-1-1 Network that has special features required to allow routing based on pre-established criteria and control by PSAP personnel. *This does not pre-suppose that it is a CAMA-type, ISDN or Internet network, just states the concept. The first rule of call management is to keep calls within the network where known features can be used to manage the calls.*

4.2.3   Enable TTY/TDD communication

4.2.3.1 Be able to pass voice and Baudot tones.

4.2.3.2 Be able to process ASCII TTY/TDD.

4.2.4   Transfer 9-1-1 calls to a PSAP that is responsible for the caller's location where the call will be answered.

4.2.5   Provide information describing the caller's location in industry-approved format to an accuracy defined in meters:

4.2.5.1 For landline calls, include users behind PBXs (including street address and/or location relevant to the PBX)

4.2.5.2 For wireless calls (where the phone is mobile). *This means only in most general terms such as Wireless 9-1-1 Phase I and II.*

4.2.5.3 For wireless calls that have some connectivity to a fixed geographical location (such as wireless local loop)

4.2.6   For landline calls, the ability to connect the call to the appropriate PSAP within 1.2

seconds of the last digit being dialed.

4.2.7   Enable transfers of the call with ALI to:

4.2.7.1   Another position within the PSAP

4.1.7.2   A different PSAP connected to the same selective router

4.2.7.3   Interface a Computer-Aided Dispatch and/or Record Management System

4.2.7.4   Interface a mobile data terminal

4.2.7.5   Interface other emergency services, such as a poison control center. *This is currently done in Texas.*

4.2.8   Have the following ALI features: *This is for "automatically" delivered info only. Subsequent paragraphs list Location Information that is recommended as discretionary (i.e., not necessarily needed, so that it would be provided only upon request).*

4.2.8.1   ALI record is based on the subscriber's telephone number or profile number

4.2.8.2   NENA company ID code

4.2.8.3   Line category:

4.2.8.3.1   Class of Service code (whether residential, business, etc.)

4.2.8.3.2   Whether Foreign Exchange or Wireless

4.2.8.4   Address/location information:

4.2.8.4.1   For landline, provide:

4.2.8.4.1.1   Street address with sub-location (floor and room/cubicle, etc.) where necessary to direct response without delay.

4.2.8.4.1.2   Latitude and longitude

4.2.8.4.1.3 Map Grid coordinates (for PSAPs that use local maps for dispatch).

4.2.8.4.1.4 Person's secondary number, such as a cellular phone as a lookup

4.2.8.4.2   For cellular wireless (includes PCS and GSM), provide:

4.2.8.4.2.1 Cell Tower's latitude, longitude, address and description of cell sector radio coverage.

4.2.8.4.2.2 Mobile Phone's:

4.2.8.4.2.2.1   Latitude and longitude

4.2.8.4.2.2.2   Map grid coordinates (for PSAPs that use local maps for dispatch).

4.2.8.4.2.2.3   Have the ALI location updated if the caller's cell phone moves.

4.2.8.4.3 For wireless calls that are restricted in movement

4.2.8.4.3.1 The above list for wireless (less ALI location update if caller moves)

4.2.8.5 Ability to do ALI Steering with the following:

4.2.8.5.1   The routing of an ALI request to the appropriate ALI database service company based on the ANI, pANI, ESRD or ESRK that is received by the PSAP or local ALI database provider.

4.2.8.5.2   The exchange of 9-1-1 ALI database information among Competitive Database Providers. *This is becoming critical as Local Number Portability (LNP) expands into the next set of Metropolitan Statistical Areas (MSAs) and we move toward Geographic Portability (GP).*

4.2.9   Call Information On-Demand

4.2.9.1 Highway Condition information to keep map displays current

4.2.10 Allow for creation and update of ALI with inputs from:

4.2.10.1   Wireline carriers to database management system to PSAP ALI controller

4.2.10.2   Wireless carriers to DMS or local PSAP ALI controller

4.2.10.3   PSAP administrators (and call takers?)

4.2.10.4   PBX service providers, where the PBX provides enhanced 9-1-1.

4.2.11   Map display of the caller's location.

4.2.11.1 Basic initial information about the caller's location:

4.2.11.1.1   Appropriate symbol to mark the location (perhaps a circle that defines the circular error probability)

4.2.11.1.2   Speed and direction, if system requests it

4.2.11.1.3   Add company code of the local street map publisher to the map for those Emergency Response Units that do not have a map display in their vehicle.

4.2.11.2 Update abilities:

4.2.11.2.1   Update upon manual request

4.2.11.2.2   Periodic update based on time set by call-taker (e.g., update every 10 seconds, every minute, every five minutes)

4.2.12   Call history maintained for follow-up and employee development

4.2.12.1   Time and date of last few calls

4.2.12.2   Incident

4.2.12.3   Call taker's ID

4.2.12.4   Results of call

4.2.13   Data Transfer. Ability to transfer categories of info, such as name, address, remarks section and call history

4.2.14   PSAP Automation

4.2.14.1   Dynamic PSAP. Enable additional PSAP positions to be activated when required upon supervisor's request. Example: Call takers who are working on admin lines at a PSAP position could be contacted and requested to come online as an additional PSAP position.

4.2.15   Have alternate routing for calls blocked by full trunks or trunk failures. Have a catastrophe procedure to divert all 9-1-1 calls should a PSAP fail.

4.2.16   Provide real-time messaging between positions at a PSAP. Examples of use include maintenance, instructions from shift supervisors to call takers.

4.2.17   Allow 9-1-1 call takers to accept non-9-1-1 calls: administrative calls, 3-1-1 calls (transferred from a 3-1-1 call taker), TTY relay services, identify test calls, etc.

4.2.18   Establish dedicated NXX for PSAPs (e.g., 9-1-1) so that calls could be transferred out of the area to a PSAP via public switched telephone network. *5-1-1 and 7-1-1 are being used in some locations.*

4.1.19   Call Hold and Ringback (Canadian and New Jersey requirement for wireline)

4.1.20   Abandoned call treatment: Enable the PSAP to capture information about calls attempted.

4.1.21   PSAP to have alternate telephone numbers so that outside official parties can contact them, such as would be the case where 9-1-1 calls are transferred from out of the region. These circuits would allow the receipt of data with the voice call.

- - - - end of Current Model - - - -

4.3   Coming this Year 9-1-1 Model

Color of text	Meaning
Black	Master 9-1-1 Model to show hierarchy in which the new features are located.
Red	New features and functions expected to be available within 12 months.

The numbering sequence follows that of the Master Model, but listing only those items expected within a year (in red) or the hierarchy to connect it upwards (which if it is expected sooner than a year is in black).

4.3.1   System is accessed via "9-1-1" dialed by caller:

4.3.1.1 No other numbers should be used (e.g., *9, 7-digit) as determined by the *Wireless Communications and Public Safety Act of 1999.*

4.3.2   Enable transfers of the call with ALI to:

4.3.2.1 A different PSAP connected via:

4.3.2.1,1   Non-traditional selective routing, such as via Intelligent Network.

4.3.3   Ability of the alarm company connectivity to enable the PSAP call-taker to speak back through the alarm company's circuits/radio path to the scene of the emergency. *By eliminating the need for an alarm company representative to relay messages, the ability of the PSAP to send the most appropriate help faster is improved.*

4.3.4   ALI Transfer. Ability to transfer categories of information, such as name, address, remarks section, call history, personal profile, building floorplans, etc.

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4.3.5   PSAP Position Mobility.

4.3.5.1   Remote Access: Enable a set of telecommunications equipment (that comprises a PSAP or PSAP position) to be set up almost anywhere and dial into a port to enable the PSAP to operate away from a fixed location.

4.3.6   PSAP Automation:

4.3.6.1 Dynamic PSAP. Enable additional PSAP positions to be activated when required upon supervisor's request. Example: Call takers who are working on admin lines at a PSAP position or at home could be contacted and requested to come online as an additional PSAP position.

4.3.7   Congestion control of 9-1-1 trunks:

4.3.7.1 Establish congestion control that can be set and changed (examples: Spike Masking and simulated facility groups (SFGs)).

 - - - End of One-Year Model - - -

4.4 Near Term (With Three-Years) 9-1-1 Model

Color of text	Meaning
Black	Master 9-1-1 Model to show hierarchy in which the new features are located.
Green	New features and functions expected in the three-to-five year term.

The numbering sequence follows that of the Master Model, but listing only those items expected within three years (in green) or the hierarchy to connect it upwards (which if it is expected sooner than three years is in black.

4.4.1   9-1-1 Network

4.4.1.1 Calls from non-public emergency response systems, including alarm system organizations, at the option of the 9-1-1 authority, arrive on the system with full capability of call management equal to that of a dialed 9-1-1 call.

4.4.2   Enable TTY/TDD communication

4.4.2.1 Be able to pass typed messages via faster, more sophisticated method (next generation).

4.4.3   Ability to send personal information over the phone (A caller's data would be available based on some user identification such as social security number or SmartCard ID.) *This is only the ability to send, a different aspect than a PSAP call taker's ability to retrieve. This concept does not preclude the possibility that a PSAP call taker would have the ability to block that information if the call taker did not need it.*

4.4.6   Enable transfers of the call with ALI to:

4.4.6.1 A different PSAP connected via:

4.4.6.1.1   A different selective router (supposing a common interface protocol so that all selective routers, regardless of manufacturer, would be able to transmit and receive the information, preferably via the PSTN). *Current Tandem-to-Tandem transfers are for ANI-*

only.

4.4.6.2 A PSAP that is out of the local area (e.g., across country, to Canada, to Mexico, to the world)

4.4.7   Have the following ALI features: *This is for "automatically" delivered info only. There is a separate section for Location Information that is recommended as discretionary.*

4.4.7.1 Address/Location Information

4.4.7.1.1 For landline, provide:

4.4.7.1.1.1 Latitude, longitude and altitude (above sea level)

4.4.7.1.2 For cellular wireless (including PCS and GSM), provide:

4.4.7.1.2.1   Mobile Phone's latitude, longitude, altitude (above sea level).

4.4.7.1.2.2   Location update upon demand by the PSAP

4.4.7.1.3 For wireless calls that are restricted in movement

4.4.7.1.3.1 Address information that informs that call taker that the phone is restricted to a geographic location or area (e.g., wireless local loop)

4.4.7.2 Have a lookup capability to a supplementary database that provides the logical addresses of each record so as to define the telecommunications service provider and ALI database service provider. This would enable PSAPs to determine the source of a record with an error where those company IDs are not available from the ALI display. It could also be used for ALI Steering and to determine if the telephone number has been ported.

4.4.8. Call Information On-Demand. Establish PSAP and 9-1-1 Network capabilities to know what additional information is available about the 9-1-1 caller and emergency, so that at the PSAP call-taker's command, this information would be retrieved.

4.4.8.1 Automatic Collision Notification data. This is available today only verbally.

4.4.8.1.1 Airbag deployment

4.4.8.1.2 Location information by Latitude and Longitude.

4.4.8.1.3 Automatic opening of a microphone and receiver in the vehicle to allow two-way conversation with either PSAP or third-party service provider that could patch call to the appropriate PSAP.

4.4.8.1.4 Number of passengers in vehicle and each person's weight by seat occupied

4.4.8.1.5 Data previously provided by the vehicle owner(s) for storage with the ACN company to be made available when necessary.

4.4.8.1.6 Delta (i.e., change in) velocity and principal direction of force.

4.4.8.1.7 Orientation of vehicle at time of collision and after collision, and whether the vehicle rolled.

4.4.8.2 Health Monitors that report condition of patient

4.4.9   Seamlessly integrate external data with ALI. System automatically takes information from outside the 9-1-1 system and provides hyperlink-type integration. (See new Internet XML format.). *This refers to the automated transmission of the data, not the providing of it via a person at the Automatic Collision Notification (ACN) center talking to a PSAP call-taker.*

4.4.9.1 Automatic Collision Notification data (See 4.1.10.1 for list.)

4.4.9.2 Health Monitors that report condition of patient

4.4.9.3 Highway Condition information to keep map displays current

4.4.10   Ability to know a third party that should be notified concerning the 9-1-1 caller's emergency. This third party could be a parent, spouse, organization, etc.

4.4.11   PSAP position mobility.

4.4.11.1   Wireless PSAP: Have the positions communicate via radio. This would use radio for the full range of equipment and systems used by a Telecommunicator at a PSAP: voice, ANI, ALI, CAD, etc.

4.4.12   Congestion control of 9-1-1 trunks.

4.4.12.1   Provide automatic notification to PSAP when congestion control has been enabled (i.e., calls are being blocked)

4.4.13   9-1-1 Priority: Where 9-1-1 calls are not transported over a dedicated network (such as a mobile radio system) the system would have a priority handling capability for the 9-1-1 calls. Integrate with other priority programs, such as Cellular Priority Access Service (CPAS) and Telephone Service Priority (which is a service restoral priority versus call-delivery)

4.4.14   Enable administrative calls (i.e., calls received on the admin number and inter-telecommunicator calls) to be transferred with data, including notes entered by the call taker. *The reverse is available to 9-1-1 systems (i.e., in an ACD system, the 9-1-1 calls can be routed to the non-emergency queue when all 9-1-1 call takers are busy. The ALI is also transferred.)*

4.4.15   Third Party, Private Emergency Notification: Automatic Collision Notification, panic alarms, health monitor alarms, etc. Allow PSAPs to receive calls and data sent by automatic collision notification systems and other private monitoring services, although this may have to go through a service bureau first.

4.4.15.1   Provide prior to call answer

4.4.15.2   Provide subsequent to call answer upon command from PSAP call taker

- - - End of Three-Year Model - - -

4.5. Five-Year 9-1-1 Model

Color of text	Meaning
Black	Master 9-1-1 Model to show hierarchy in which the new features are located.
Blue	New features and functions expected in five years or later.

The numbering sequence follows that of the Master Model, but listing only those items expected five years or later (in blue) or the hierarchy to connect it upwards (which if it is expected sooner than five years is in black.

4.5.1.   Have the following ALI features: *This is for "automatically" delivered info only. There is a separate section for Location Information that is recommended as discretionary.*

4.5.1.1 Address/Location information:

4.5.1.1.1 For landline, provide

4.5.1.1.1.1 Latitude, longitude and altitude (above sea level) and altitude or elevation (above ground)

4.5.1.1.2 For cellular wireless (includes PCS and GSM), provide:

4.5.1.1.2.1 Mobile Phone's

4.5.1.1.2.1.1   latitude, longitude and altitude or elevation (above ground) and confidence factor.

4.5.1.1.2.1.2   velocity and direction

4.5.2.1.2.2 Subscriber's address (but with obvious designation that this is a "home" address, not the location from which the call is being made.)

4.5.3   Call Information On-Demand. Establish PSAP and 9-1-1 Network capabilities to know what additional information is available about the 9-1-1 caller and the emergency, so

that at the PSAP call-taker's command, this information would be retrieved. *This is the pre-established data path to provide this information, not the verbally communicated data, which is currently available.*

4.5.3.1 Personal Health data from insurance companies or person's doctor.

4.5.3.2 The driver's "smart card." A smart card would have a person's personal data that is recorded on an EPROM or magnetic strip. The driver would insert his smart card into a read slot in the vehicle. Should the vehicle become involved in a collision, this would enable pertinent medical data to be sent to the ACN center, which could then forward it to emergency medical personnel.

4.5.4.   Ability to know a third party that should be notified concerning the 9-1-1 caller's emergency. This third party could be a parent, a spouse, an organization, etc.

4.5.5   PSAP Automation:

4.5.5.1 Robotic PSAP. Enable basic or initial PSAP functions, such as call-answering with ALI display to be handled in an automated process. Perhaps use voice recognition to do some tasks.

4.5.6   Congestion control of 9-1-1 trunks.

4.5.6.1 Enable manual changing of congestion choke points by PSAP *This is listed for the five-year model owing to the need to resolve liability issues.*

4.5.6.2 Provide for dynamic management of congestion control via a graphic interface that impacts all carriers providing service in geographic zones.

4.5.7   Dynamic ALI Updates: Enable all certificated telecommunications carriers to have same-day updates to the ALI database when a person signs up for service.

4.5.8   Secure IP Network: Have a dedicated secure network as the IP network for callers.

- - - End of Five-Year Model - - -

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Committee participants

1. Al Aldecocea .... US West
2. Darryl Brown .... SignalSoft
3. Tim Dunn .... SignalSoft
4. Gene Gerber .... Lucent Technologies
5. Gordon Gipson .... Integrated Data Communications
6. Marc Godin .... CML Technologies
7. Debbie Guyton .... Telcordia Technologies
8. Dick Khan .... Pacific Bell Telephone
9. Karen LaRose .... CML Technologies
10. Carol Martzelt .... USWest
11. Ron Mathis .... SCC
12. Ian McGraw .... Plant Equipment, Inc.
13. Andy Nielsen .... RCC Consultants
14. Robert Oenning .... Washington State 9-1-1
15. Jo Oehrlein .... HBF Group
16. Russ Russell .... 9-1-1 SME Consulting
17. Bob Sherry .... Lucent Technologies
18. Paul Stoffels .... Ameritech
19. Bob Thompson .... ATX Technologies
20. Ann Vermilyea .... ICG Communications
21. Kim Vought .... Motorola CGISS
22. Nate Wilcox .... State of Vermont E9-1-1 Board

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Submitted by:
     Russ Russell
     Chair, Future Models Study Group