STATE OF NEW JERSEY

Office of Emergency Telecommunications Services

Introduction to the New Jersey 9-1-1 Network

Training Guide

njoit New Jersey Office of Information Technology

Introduction to the New Jersey 9-1-1 Network Training Guide

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Introduction:

This training guide will provide those who work within emergency 9-1-1 answering and dispatch points an understanding of the technical and operational components of New Jersey's Enhanced 9-1-1 System. The student will learn how to correctly interpret information delivered to the PSAP by the 9-1-1 network and the actions or cautions associated with that information. The student will learn the expected performance standards for PSAP personnel and the importance of maintaining those standards.

Training Objectives

Upon completion of this block of instruction, the student will achieve and demonstrate the following objectives in accordance with the information presented.

1. Trace the legislative and operational developments that led to New Jersey's statewide 9-1-1 system.

2. List the benefits of enhanced 9-1-1 service.

3. Describe the organizational structure of 9-1-1 in New Jersey.

4. Identify the difference between Basic 9-1-1 and Enhanced 9-1-1.

5. Compare the differences between wireless call routing and wire line call routing.

6. Identify the special features of New Jersey's 9-1-1 system.

7. List the standards and regulations pertaining to PSAP and PSDP operations.

8. Demonstrate the ability to use the information presented on the ALI Monitor.

Instructional Method

This unit will be presented through lecture, discussion and class group activities. Student participation is essential to a meaningful learning experience. The Public Safety Telecommunicator (PST) has an active role in public safety; skills developed during this training session will be invaluable in ensuring a successful and rewarding career as a PST.

I C O N   K E Y
🗁 File for future reference
🖉 Test your knowledge
💬 Discussion point
📖 Unit Objective

About the "Picture" Icons

Throughout this text you will see icons that will alert you to specific actions pertaining to the information provided.

Historical Overview

Worldwide

As early as 1937 countries began to designate a number that was easy to remember and dial for access to emergency services.

> **Emergency Service Numbers:**
> **Great Britain (1937) 9-9-9**
> **Europe 1-1-2**
> **Japan 1-1-9**
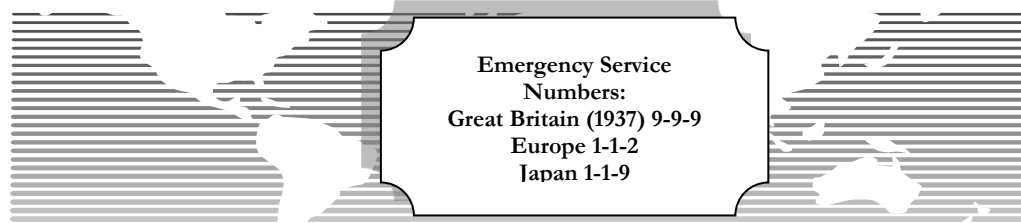
> 📖 **Objective 1:**
> Trace the legislative and operational developments that led to New Jersey's statewide 9-1-1 system.

United States

The establishment of a universal emergency services access number took several years. Congress first investigated this concept in 1958; it wasn't until 1968 that the first 9-1-1 call was made in Haleyville, Alabama.

New Jersey

Atlantic City is credited as the first municipality to provide 9-1-1 service in New Jersey. This service began in 1972. In 1976, a New Jersey Legislature study commission recommended that municipalities provide access to emergency services through 9-1-1. The first countywide 9-1-1 system was established in Hunterdon County in 1977.

The Statewide Police Emergency Network performed an assessment of all New Jersey police telecommunications systems in 1977. This task force recommended "*the State of New Jersey, in accordance with national policy encourages the implementation of 9-1-1 throughout the state.*" New Jersey's initial 9-1-1 legislation was drafted in 1984 by the APCO Atlantic Chapter's Ad Hoc New Jersey 9-1-1 Committee. As a result of this committee's work, the Emergency Response System Study Commission was created in 1986. This committee's report was the basis for the New Jersey State 9-1-1 Law (P.L.1989,c3 NJSA 52:17c-1 et seq.) passed in 1989. This statute required the implementation of a statewide-enhanced 9-1-1 system and created the New Jersey 9-1-1 Commission and Office of Emergency Telecommunications Services (OETS). Under the authority of this law, Administrative Regulations (N.J.A.C.17:24) were issued. These regulations specify the technical and operational requirements and standards for all components of the New Jersey's statewide 9-1-1 enhanced emergency telephone system.

What factors would influence the number chosen as an emergency service number?

Benefits of 9-1-1

Benefits to the Public

The primary benefit to the public is the speed and convenience with which 9-1-1 can be dialed. People no longer need to remember several different ten-digit telephone numbers to reach emergency response agencies. The number to reach emergency services remains the same regardless of where in New Jersey you are and which service is required. In an emergency away from home callers no longer have to worry about knowing the correct number to call or their exact location.

The enhanced features of New Jersey's 9-1-1 system ensure that callers who are unable to speak or have the telephone taken from them will have their location information sent to the appropriate PSAP (Public Safety Answering Point).

Callers do not have to decide the most appropriate agency to call in an emergency. All emergency services are accessible through 9-1-1.

9-1-1 can be dialed as a free call from any coin operated telephone. The 9-1-1 regulations require all vendors to allow these calls to be passed to the 9-1-1 network without cost to the caller.

Benefits to the Emergency Service Responders

One of the primary benefits to emergency responders is that location information is delivered with the caller. This allows the call-taker to quickly verify the location of the event and initiate appropriate dispatch actions. Confusion due to sound alike street names is reduced and responders avoid the frustration of erroneous location information.

Another benefit to responders is that units can be dispatched to aid callers even if the connection is lost after the call is delivered to the PSAP. Assistance can be provided even if the caller loses consciousness or if the telephone line is cut.

Information captured on the printer or by the equipment's memory further documents information received which may aid in follow-up investigations or enforcement action. This may be especially useful in reducing false alarms.

Benefits to Telecommunicators

The telecommunicator is aided in several ways by the enhanced 9-1-1 system. The selective transfer keys (F1- Police, F2-Fire and F3-EMS) provide rapid access to dispatch points and other PSAPs.

The initial information gathering phase of the call is expedited because the telephone number and location information are delivered with the call. Verification of the information presented on the ALI (Automatic Location Identification) and ANI (Automatic Number Identification) displays is much quicker than fully interrogating each caller to determine the information.

New Jersey's 9-1-1 Organizational Structure

State Level

The New Jersey Public Safety Communications Commission (formerly the 9-1-1 Commission) is composed of representatives from all areas of the public safety community and representatives from the telephone companies in New Jersey. The primary function of the Public Safety Communications Commission is to aid the Office of Emergency Telecommunications Services in the planning, design and implementation of the statewide 9-1-1 system. The Commission is a source of information and support for OETS in areas such as training, public education, technical developments and PSAP standards.

The Office of Emergency Telecommunications Services (OETS) was established through the passage of the state 9-1-1 Act. OETS has several areas of responsibility:

- Establishment and maintenance of a State 9-1-1 Plan. This plan includes configurations and requirements for the enhanced 9-1-1 network. It also defines the role and responsibilities of the counties and municipalities of the State. Finally, it sets the technical and operational standards for the establishment of Public Safety Answering Points (PSAPs).

- OETS must perform inspections to ensure that PSAPs meet the established technical and operational standards prior to allowing that facility to become active on the 9-1-1 network. The OETS staff may also perform periodic audits to ensure that the initial standards are being maintained.

- OETS assists in the coordination of telecommunicator training programs and develops public education programs to increase public awareness on issues concerning the enhanced 9-1-1 system.

- The office must keep abreast of new technologies and address their impact upon the existing enhanced 9-1-1 system.

Telephone Companies

During the initial implementation of 9-1-1 in New Jersey there were only three companies providing telephone service: Bell Atlantic, Sprint telephone, and Warwick Valley Telephone. Due to regulatory changes resulting from the Federal Telecommunications Act of 1996, many other telephone companies began providing service in New Jersey in 1997. The New Jersey 9-1-1 Act requires that all telephone companies providing service in the State provide enhanced 9-1-1 access to their customers.

Verizon has been contracted by the State to perform several functions. Verizon is responsible for monitoring the 9-1-1 network and giving priority to the 9-1-1 traffic flow. There are three groups within Verizon that serve the 9-1-1 system:

1. 9-1-1 Service Management: This is the customer support group that worked with OETS during the implementation period, overseeing the installation of the appropriate PSAP trunks, the ESN programming and the network training at all PSAPs and PSDPs with enhanced equipment. This group continues to be the point of contact for OET staff on matters of changes in the PSAP configuration and network changes. This group also coordinates the installation of 9-1-1 telephone equipment purchased from Verizon.

2. 9-1-1 Customer Care Center (formerly 9-1-1 Control Center): The Customer Care Center (CCC) serves as a central point of contact for all PSAP trouble reports through the toll free number 800-773-7911. The 9-1-1 CCC is also responsible for all expeditious repair of any other 9-1-1 network components.

3. Database Management Center (DMC): The staff at the DMC is responsible for maintaining the Verizon ALI database. There are several sources of information for this database:

   a. All Verizon service orders received are entered into the Service Order Processor. These orders are reviewed to see if they affect the 9-1-1 database. Some orders, such as call waiting service, do not impact on the 9-1-1 database and are discarded. Others, such as address changes, subscriber information corrections or new installations are processed and forwarded to the database computers.
   b. Input is also received from other telephone companies through their order processing procedures.
   c. A third source of information is through the 565 municipal 9-1-1 coordinators who update the municipal data when new streets or address ranges are added.
   d. Errors may be found by Public Safety Telecommunicators (PSTs) when callers dial 9-1-1 and the data on the ALI screen is incorrect. **These errors must be reported to the telephone company [local exchange company (LEC)] from which the subscriber receives service.** The form used to report errors is the <u>New Jersey 9-1-1 PSAP Inquiry Form</u>. [See Attachment 1 for a sample of this form.]

Pay Telephone Companies: The 9-1-1 Administrative Code requires that all pay telephone vendors in the State of New Jersey to provide dial tone first capability that will allow a caller to dial 9-1-1, be transferred as necessary, and complete a 9-1-1 call without first inserting a coin or other device. Additional ALI information is provided on some pay telephones. A detailed list of the abbreviations used in identifying pay telephone locations is found in attachment 2.

Wireless Carriers: Wireless service providers must inform OETS as to the location of all cell towers and any changes or new installations. OETS staff is responsible for examining the site's coverage area and determining the appropriate PSAP to direct 9-1-1 calls from that site.

Voice over Internet Protocol (VoIP) Providers: The level of 9-1-1 service available through these providers varies depending upon the company. Some VoIP providers are able to provide enhanced 9-1-1 service with ALI and ANI information. Other companies are still striving to meet this level of service. Calls from customers of these companies will be routed to a PSAP with a "shell record" which only displays the fact that the call is from a VoIP phone and generic ALI for the municipality where the service is registered.

Why is it important that all types of telephone service providers maintain the ALI database?

9-1-1 Equipment Vendors

The 9-1-1 Administrative Code stipulates that manufacturers and suppliers of equipment proposed for connection to the 9-1-1 network must receive approval from OETS. OETS ensures that the equipment is capable of performing that function and will not present a danger to the integrity of the 9-1-1 system.

County Government

The 9-1-1 Act requires that the governing body of each county appoint a County 9-1-1 Coordinator whose responsibilities include:

- Coordination of 9-1-1 activities within the county, in accordance with the 9-1-1 Act and standards set by OETS.
- Meet with representatives of the county, municipalities and local public safety agencies to formulate and maintain the county 9-1-1 plan.
- Work with representatives from municipalities and the telephone companies to maintain the 9-1-1 Master Street Address Guide (MSAG).

Municipal Government

The municipal 9-1-1 coordinator serves as a local point of contact for concerns regarding 9-1-1 service in the municipal jurisdiction. Areas of responsibility include:

- Provide the data required to maintain the MSAG.
- Maintain the municipal 9-1-1 plan, indicating the nature of the municipality's participation and updates to the plan as needed due to local changes.
- Serve as a point of contact on 9-1-1 matters for state, county or local representatives.

Public Safety Answering Points (PSAPs)

Public Safety Answering Points are the locations where 9-1-1 calls are directed by the state 9-1-1 network. A PSAP may be operated on a county, regional or municipal basis. The management of the PSAP is a matter of local decision. The staffing of call-taker and dispatcher positions within the PSAP falls under the purview of the 9-1-1 Administrative Regulations.

Public Safety Dispatch Points (PSDPs)

PSDPs are also known as secondary PSAPs. Calls may be transferred to a PSDP from a PSAP for dispatch of police, fire or EMS services. As with primary PSAPs, they may be operated on a county, regional or municipal basis and the management of the facility is a matter of local decision. The 9-1-1 Administrative Regulations state that each PSDP must be staffed with the number of dispatchers necessary to comply with the dispatch performance standards established by the

governing agency. Additionally the regulations require that the PSDP be equipped with sufficient telephone lines to allow the PSDP to answer 90 percent of the PSAP transfers within ten seconds during the busiest hour. The telephone equipment at a PSDP may be enhanced 9-1-1 equipment or regular telephone equipment. Training requirements for PSDPs vary:

> At police and fire PSDPs the regulations state that the staff may either be trained in the specific service they will dispatch by the local governing agency or certified by OETS at the level required for PSAP staff.

> PSDPs that serve as the Emergency Medical Dispatch (EMD) provider for a PSAP must have a staff that is EMD certified as required by the regulations.

Differences between Basic and Enhanced 9-1-1

Features

Basic 9-1-1 is an emergency telephone system that automatically connects 9-1-1 callers to a designated answering point. Basic 9-1-1 may or may not provide Automatic Number Identification (ANI) and/or Automatic Location Information (ALI).
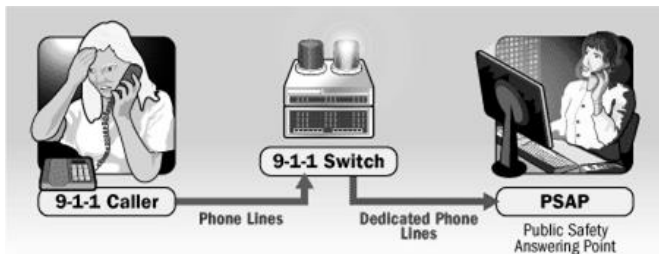
Figure 1: Basic 9-1-1 call processing

Enhanced 9-1-1 service delivers calls to the appropriate Public Safety Answering Point with both ANI and ALI. These features expedite the initial caller interrogation by providing the call-taker with the telephone number and location of the caller when the caller is using a traditional wire line phone. There are some differences when the call is from a wireless or Voice over Internet Protocol (VoIP) phone. These differences will be further examined later in this unit.
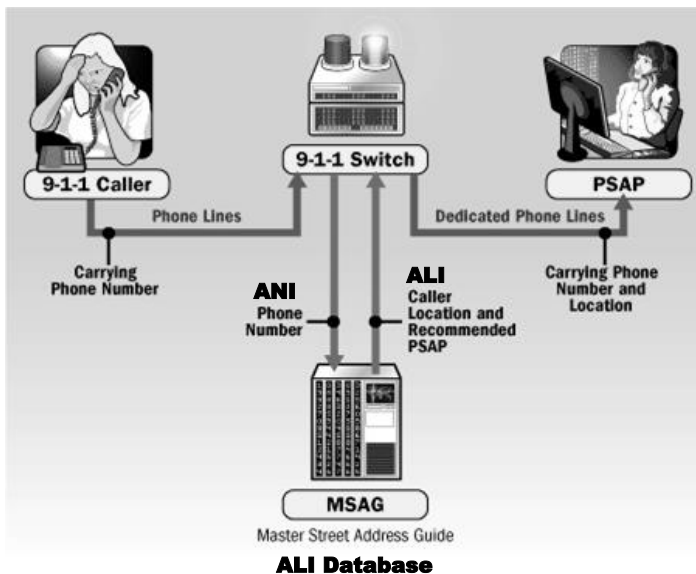
Figure 2: Enhanced 9-1-1 call processing

Wireline Call Routing

With basic 9-1-1, all calls made within the service area of a telephone company central office must be routed to the same Public Safety Answering Point (PSAP). A major problem with this system was that central office coverage areas rarely match those of the PSAP jurisdictional boundaries. The caller would not always be directed to the PSAP primarily responsible for service in that area, sometimes requiring multiple transfers.

Enhanced 9-1-1 calls are directed to the correct PSAP, based on the address associated with the subscriber's telephone number, regardless of central office boundaries. This process is known as selective routing. In New Jersey, PSAP coverage areas have been mapped to indicate municipal boundaries, street names and address ranges and specific police, fire and emergency medical agencies servicing that area. These unique areas are known as Emergency Service Zones ESZ) to which an Emergency Service Number (ESN) is assigned.
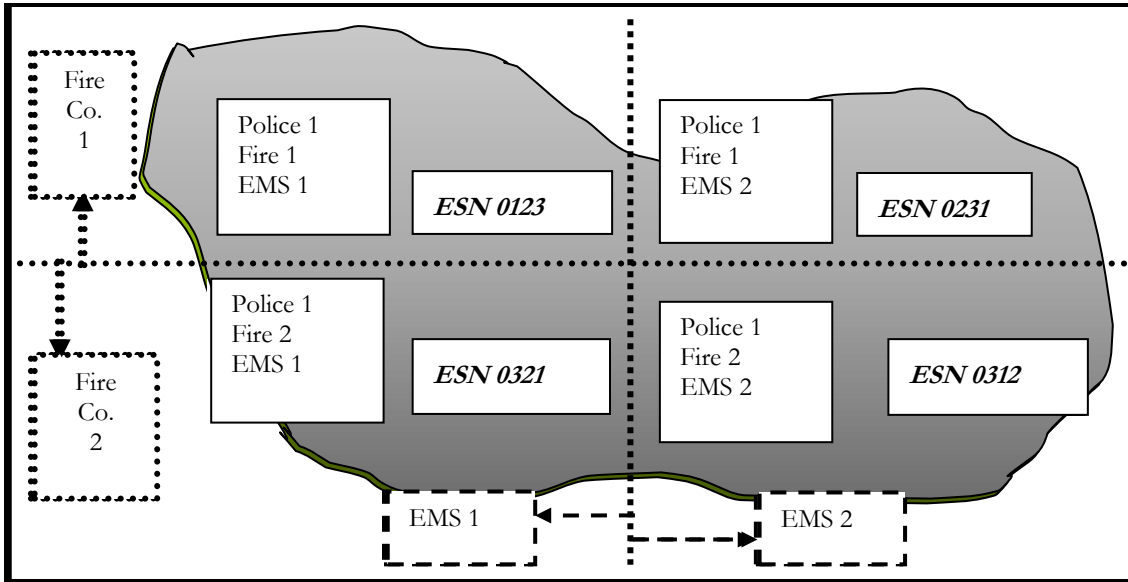
Figure 3 Sample MSAG Map

When an enhanced 9-1-1 call is made, the call goes to the local central office (CO) where it is recognized as an emergency call. The CO passes the call over special lines to a central office telephone switch known as a 9-1-1 tandem. The 9-1-1 tandem performs several functions in order to process the 9-1-1 call:

1. It queries a database to determine the correct PSAP to serve the area where the telephone service is registered.

2. It transmits the call and information over special telephone lines to the correct PSAP.
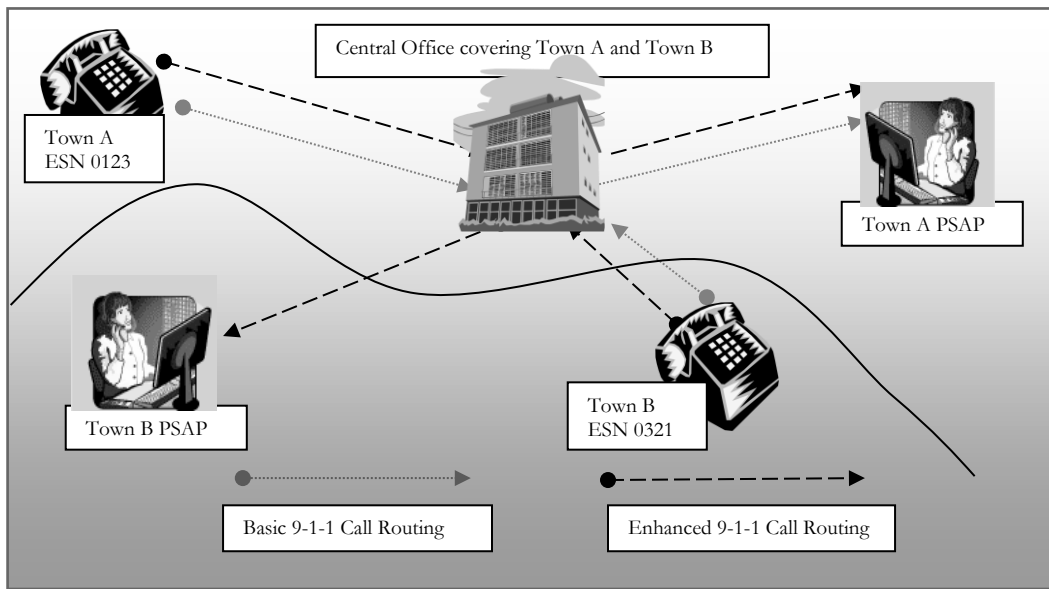
Figure 4.Basic and Enhanced 9-1-1 call routing: With Basic 9-1-1 all telephones connected to the central office are routed to Town A PSAP, with Enhanced 9-1-1 the calls are selectively routed based upon the address registered for the telephone service.

There are some scenarios that could prevent a 9-1-1 caller from reaching the PSAP:

1. If the caller is unable to get a dial tone because the telephone is out of service9-1-1 cannot be dialed.

2. The lines to the central office are out of service 9-1-1 cannot be dialed.

3. If the CO is isolated from the rest of the telephone system due to catastrophic failure, it may be unable to pass the call out to the 9-1-1 network. Every attempt has been made to ensure that trunking to and from the Central Offices is diversely routed to avoid such failures.

Figure 5 Showing location of caller and location of cell tower receiving 9-1-1 call.

While basic 9-1-1 was a great improvement over the previous method of having several seven or ten digit numbers to dial for emergency services in each jurisdiction, it is clear that development of enhanced 9-1-1 brought about even greater improvement in emergency response agency access. Callers now had one three digit number to call and the PSTs have call back and location information provided.

Wireless Call Routing
9-1-1 calls from cell phones are routed based on the cell tower receiving the call not the location of the phone making the call. For this reason routing is difficult and may not be received by the correct PSAP.

The ALI screen will provide an estimate of where the caller is in the form of latitude and longitude on line 8. The Class of Service on line 9 will indicate if the latitude and longitude are the tower location or the caller's estimated location.

The PSAP can verify the location by asking the caller where they are and comparing that to the location provided on the ALI screen.

VoIP Call Routing
9-1-1 calls made over a VoIP network are be routed in different ways. One uses the same method as the wireline call using the MSAG. This is usually used with customers whose service remains in one place referred to as "static".

VoIP customers who can take their service with them and connect to any internet source may be routed by their location. This is referred to as "nomadic". The customer provides the address to the VoIP service who then obtain the latitude and longitude of that address from a commercial source. They then determine the municipality where that latitude and longitude are and use it to route to the PSAP who services that municipality. This method is becoming more popular with all VoIP services and is being used for the "static" customers also.

Text to 9-1-1 Routing

Text to 9-1-1 messages are routed similarly to wireless calls. Some by the cell tower receiving the message and some by the device location.

If the message is received over the existing 9-1-1 network using TDD/TTY the ALI screen will offer a latitude and longitude like a wireless call but not the address of the cell tower. The text message will also offer an estimated latitude and longitude which may differ from the location on the ALI screen.

Wireless 9-1-1

**Evolution
of the Cell
Phone
1973 – 2010**

Figure 6. Evolution of wireless telephones

> **📖Objective 5:**
> Compare the differences between wireless 9-1-1 and wire line 9-1-1.

Phase 0

At the time that enhanced 9-1-1 service was initially being implemented, the impact of wireless callers dialing 9-1-1 was not an issue. At that time, cell phones were bulky, very expensive and had limited coverage. For these reasons, there were very few users and they mainly used them for business purposes. In New Jersey it was decided that 9-1-1 calls made from cell phones would be directed to State Police PSAPs. There was logic to this decision since most of the calls were made from highways where the State Police had jurisdiction and because they had the resources to transfer calls to the appropriate PSAP when necessary. Initially this system worked because there were so few of these calls and the calls were often from areas of the State Police jurisdiction.

There were many problems with early wireless 9-1-1 calls in other parts of the county as well as in New Jersey. In some cases callers would get a message that 9-1-1 was not available in the area from which they were calling. The biggest problem for those who did get through to a PSAP was that the caller's location and telephone number were not transmitted to the PSAP. This stage of wireless 9-1-1 is referred to as Phase 0. Location is the most vital information for any 9-1-1 call. Quite often calls were received in PSAPs a great distance from the location of the emergency. Many callers had no idea where they were. They might be disoriented due to the emergency or they may not have been familiar with the area. This would cause a delay in the emergency response as the telecommunicator and emergency responders attempted to locate the event. If a caller hung up or the call was disconnected there was usually no way to call them back. The telecommunicator needed a roaming access number in addition to the caller's number to reach the caller and this information was not sent with the call.

During the period that wireless 9-1-1 was being received in Phase 0, wireless technology continued to advance and the number of users grew. The Cellular Telephone Industry Association reports that in the United States there were 340,213 cellular subscribers in 1985, over the next ten years this number increased almost hundredfold to 33,785,661. With this increase in users, came many more calls from these devices to 9-1-1 centers. The problems caused by a lack of enhanced information such as location and calling party's numbers became more apparent. In response to complaints from the public safety community and the public, the FCC issued an order in 1996 (FCC Report and Order 96-264) requiring that the cellular telephone industry provide enhanced 9-1-1 service to their subscribers. The enhancements were to take place in two stages known as Phase 1 and Phase 2.

Phase 1

Phase 1 was the first step toward enhanced 9-1-1 service for callers using wireless devices. It required that callers be directed to the most appropriate PSAP for the area where the call was processed and that the callers' wireless telephone number and the location of the cell tower processing the call be sent with the call to the PSAP ALI screen. This step addressed the problem of callers not receiving any 9-1-1 service and the lack of a call back number but still did not provide accurate location information. The location of the cell tower processing the call is of little help in finding a caller

since the cell tower could be several miles from the point where the call is being made. Calls may still be received with Phase 1 information for several reasons. If there is a problem in determining or transmitting the location data to the PSAP the call will be delivered to the PSAP with Phase 1 information. The call taker is alerted to this situation by ALI screens and the actions required based upon the information provided will be covered later in this unit.

ALI Caution Line:
This message advises that the call is capable of Phase 2 information but it was not received for some reason.

Address Line:
Address of the cell tower, **NOT THE CALLER..**

```
*WRLS PH2* LAT/LONG NOT AVAILABLE
609-783-4216 09:30:34  02-08-05
CINGULAR WIRELESS
0000000655        ABSECON
                        BLVD   SE
RADIUS 04 MILES
ATLANTIC CITY                   XX
+039.371060  -074.430250
UNC:            %          WPH1

ESRD # 609-511-6545      ESN 5935
ATLANTIC CITY PD


F1=EGG HRBR CITY  609   235-1000
F2=PLEASANTVIL    609   933-0555
F3=AC EXPRESSWAY  609   969-3128
                   LEC CNGLR
```

Latitude and Longitude Line:
The latitude and longitude of the cell tower as stored in the database..

Class of Service:
Alerts the PST that the location information displayed is Wireless Phase 1 that is the location of the cell tower.

Figure 7. Phase 1 wireless ALI Screen for calls capable of Phase 2 service

Phase 2

The implementation of wireless Phase 2 service marked the beginning of truly enhanced 9-1-1 service for callers using wireless devices. The FCC Order required that in addition to the Phase 1 information, the location of the caller be delivered in the form of a latitude and longitude with a certain degree of accuracy. Depending on the location technology used, the accuracy is required to be within 150 to 300 meters of the actual location for 97% of the calls.

ALI Caution Line:
Indicates call is Wireless Phase 2 with no additional warning.

Address Line:
Address of the cell tower, **NOT THE CALLER..**

```
*WRLS PH2*
609-783-4216 09:30:34   02-08-05
CINGULAR WIRELESS
0000000655        ABSECON
                     BLVD   SE
RADIUS 04 MILES
ATLANTIC CITY                   XX
+039.365560  -074.424450
00000100       67%          WPH2

ESRD # 609-511-6545      ESN 5935
ATLANTIC CITY PD
F1=EGG HRBR CITY  609   235-1000
F2=PLEASANTVIL    609   933-0555
F3=AC EXPRESSWAY  609   969-3128
                 LEC CNGLR
```

Latitude and Longitude Line:
The estimated latitude and longitude of the caller as determined by the service provider.

Class of Service:
Alerts the PST that the location information displayed is that of the wireless device, with a certain degree of accuracy.

Figure 8: Phase 2 wireless screen

In order to deliver the wireless location information modifications had to be made to the wireless and 9-1-1 networks. Figure 7 is a diagram showing how wireless 9-1-1 calls and the data associated with them flow. In comparison to wire line calls, there are several extra components in the routing of wireless calls. For wire line calls the telephone is always in the same location so the information is maintained in a database. In Figure 7 the right side of the diagram is basically the components involved in the delivery of wire line calls. The left side of the diagram illustrates the additional technology involved in the delivery of wireless 9-1-1 calls.
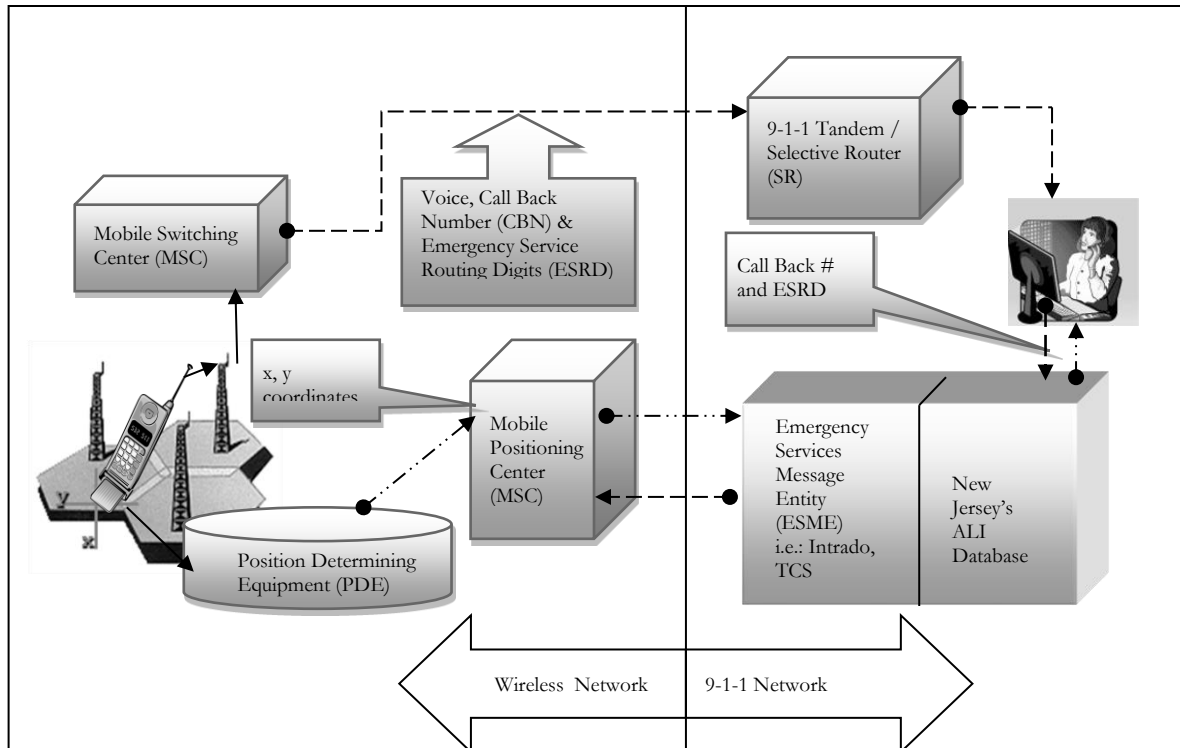
Figure 9: Diagram of Phase 2 wireless 9-1-1 call routing

VoIP 9-1-1

Voice over Internet Protocol (VoIP) telephone service is the newest telecommunications technology to impact on 9-1-1 service. There are three types of VoIP service:

• Stationary: Users with this type of VoIP connection the users cannot move their phone service. The location of the VoIP phone does not change.

• Nomadic: This type of service allows the user to take their phone service with them where ever they have a broadband connection they can plug into. The location of the VoIP phone can change from call to call but not during a call.

• Mobile: The subscriber to this service connects to the Internet by means of a Wi-Fi or other technology that allows the user to travel during the call. The location of the VoIP phone can change during the call.

Stationary VoIP

```
908-783-4216 09:30:34  02-08-13
FLANNAGAN ROBERT
0000000203      FLOCKTOWN
                          ROAD

WASHINGTON TWP              NJ

APT          FLR         RESD

PILOT# 908-783-4216    ESN 1298
MORRIS COUNTY COMM CTR  973
WASHINGTON TWP PD 908   876-3232
WASH TWP FD STA35 908   876-3232
LONG VALLEY FA  908     876-3232
                     LEC CMST
```
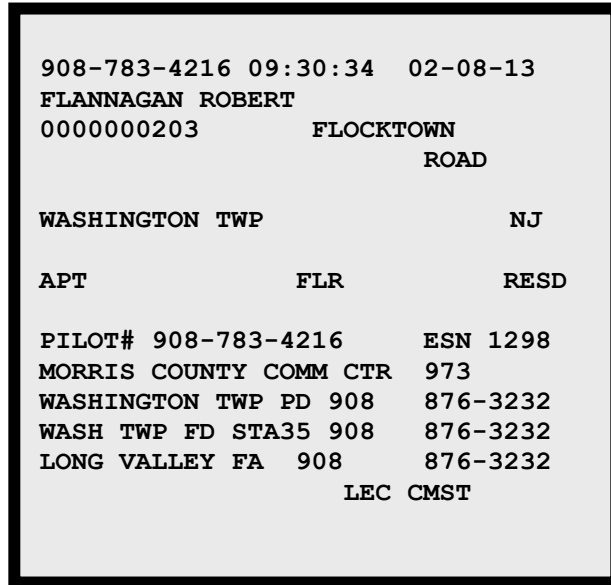
Figure 10: static VoIP ALI screen

The ALI screens for stationary VoIP services look the same as those for wire line services.

The only indication that this call is not from a traditional wire line service provider is the name of the local exchange carrier (LEC) on line 16. The records for these subscribers reside in the same database as the wire line records.

To allow the implementation of VoIP service in New Jersey, a default ALI screen has been created for each municipality (Figure 17). If a VoIP provider does not have a database prepared, a default ESNs can be used to direct the call to the primary PSAP for the municipality where the service is registered. This ESN can also be used if the VoIP provider's database is in place but experiences some type of failure. The information on the ALI display only provides information regarding the municipality where the service is registered and an alert that this is a VoIP call.

Nomadic VoIP

ALI Caution Line: Indicates call is VoIP service.

Latitude and Longitude Line: Determined by the service provider using the address of the caller.

```
*VOIP VPC CALL*
908-783-4216 09:30:34  02-08-05
FLANIGAN ROBERT
0000000203      FLOCKTOWN
                          ROAD

WASHINGTON TWP              NT
+039.919531  -075.095522
UNC:           %         VOIP

ESRD # 908-211-6545    ESN 0694
MORRIS COUNTY COMM CTR 973
WASHINGTON TWP PD  908  876-3232
WASH TWP FD STA 36  908 876-3232
LONG VALLEY FA     908  876-3232


              LEC VNTG
```
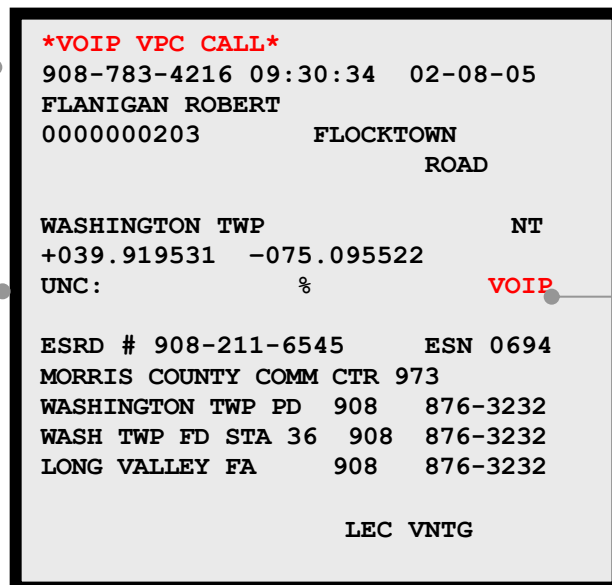
Class of Service: Alerts the PST that the call is VoIP..

Figure 11: nomadic VoIP ALI screen

ALI records for nomadic VoIP customers do not reside in the standard State of New Jersey 9-1-1 database maintained by Verizon. They are maintained by separate entities known as VoIP Positioning Centers (VPCs) and they provide Dynamic Automatic Location Information (DALI). It is the VoIP customer's responsibility to provide the VoIP service provider with the information regarding where the service is to be used and to update that information whenever it is moved. This information is then stored by the VPC providing the database service. It is not unusual for a VoIP customer to move or travel and forget to update their location information. This has resulted in 9-1-1 calls being delivered to New Jersey PSAPs from other states or foreign countries. It is always important to verify the actual location of an emergency and never to rely solely on the data supplied on the screen.

To process a 9-1-1 call through a VPC, the provider assigns a number known as an Emergency Service Query Key (ESQK). A generic MSAG with these ESQK assignments has been created to facilitate the routing of the DALI records associated with VoIP 9-1-1 calls to the correct PSAP. The ESQK appears on line 11 on the ALI screen but is labeled ESRD. The ESQK appears to be a telephone number but if dialed it would simply route back to the PSAP. There are other differences between the VoIP ALI screen and the wire line or wireless screen. Line 1 sends a caution message that this is a VoIP call and that the ALI is based on the information provided through the VPC. The subscriber's name and address are displayed as they are on wire line ALI screens but the field for the state on line 7 may display "NT" instead of "NJ".

A latitude and longitude for the street address displayed is entered on line 8. The VoIP provider obtains this information by sending the address given by the caller to service that will provide the latitude and longitude of the address. **This will then be plotted on a map to determine which municipality the address is located in and routed to the PSAP for that municipality using the default ESN.**

Each of this type of VoIP provider maintains its own MSAG, separate from the existing landline MSAG. The VoIP MSAG is linked, by municipality, to a default ESN for each municipality. The name and address displayed on the ALI screen is maintained and provided by the VoIP provider's data service.

Some VoIP providers are using a combination of traditional wireline MSAG routing and geographic coordinates.

Mobile VoIP

Mobile VoIP can incorporate wireless phones onto the existing business VoIP service in a complex or campus environment. It can also allow cell phones to access the service.
9-1-1 calls may appear like a previously mentioned VoIP calls with a business name and address or like a wireless call with a cell tower location.

Some Apps for smartphones will provide 9-1-1 calls with a combination of information from wireline and wireless. These will be discussed in another chapter.

New Jersey's Enhanced 9-1-1 System – Special Features

📖 Objective 7:
Identify the special features of New Jersey's enhanced 9-1-1 system.

Selective Transfers

Because each ESN represents a unique response area, transfer keys identified as F-1-Police, F-2 Fire, and F-3 Medical can be used to transfer callers from the PSAP to specific dispatch agencies or other PSAPs using the selective transfer keys. Each ESN has a unique combination of transfers associated with it. On wire line calls these transfers are always programmed for transfer to the Police, Fire or EMS agency responsible for the area assigned the ESN. Special ESNs are created for routing and transferring wireless calls. These ESNs are built to speed transfers to other PSAPs that could possibly provide emergency services to the coverage area of the cell site instead of transferring to police, fire or EMS.

Fixed Transfers

Other transfers on the New Jersey 9-1-1 Network are referred to as fixed transfers and do not change based upon the ESN from which the 9-1-1 call originated. Many PSAPs have designated fixed transfer keys for adjacent PSAPs and PSDPs to facilitate call transfers. These transfers may be made over the 9-1-1 network to agencies equipped with enhanced 9-1-1 equipment or transferred to a regular telephone line at agencies without enhanced equipment. OETS maintains and distributes the New Jersey 9-1-1 Transfer Directory that contains the 9-1-1 network transfer numbers for all PSAPs and PSDPs in New Jersey. This directory also contains transfer numbers for other government agencies and institutions that are not on the 9-1-1 network. When calls are transferred between two enhanced sites, using the PSAP transfer numbers, the ANI and ALI information is transferred along with the caller.

These are fixed transfer keys that each PSAP in New Jersey is required to maintain:

- Poison Control – allows rapid conference transfer to the Poison Control Center.

- Redundant Call – this transfer connects the caller to the 9-1-1 network redundant call message. This message informs the caller that the incident they are reporting has already been received. Care must be taken before transferring a caller to this message. The call taker must first confirm that the caller is reporting the same incident and that there are no new developments being reported before transferring the caller to this recorded message. Failure to confirm that the caller has no new information or is not reporting a different incident can have serious consequences.

- Non-Emergency Call – this transfers the caller to a recorded message advising that the incident they are reporting is not of an emergency nature and that they should call the appropriate agency via the agency's 10-digit number. It is important to remember that this is a generic recording used statewide, it does not inform the caller of the correct number to dial. Many agencies will simply inform the caller of the correct number to dial when the work load allows.

Public safety telecommunicators must follow their agency's standard operating procedure on the use of the Redundant Call or Non-Emergency Call fixed transfer keys. The important thing is to keep 9-1-1 access available for emergency callers. **Callers who are not reporting an emergency should not be transferred from the 9-1-1 line to another department for service.** This ties up a 9-1-1 line back to the central office even though the 9-1-1 line at the PSAP appears to be available.

PSAP to PSAP Transfers

In addition to the Selective Transfer Keys the New Jersey 9-1-1 network has software that allows a direct PSAP to PSAP transfer of the caller as well as the data on the ALI screen between any PSAPs or enhanced PSDPs in the State. The direct transfer is accomplished as follows:

> Advise the caller they are being transferred to the appropriate answering point or dispatch point for the incident being reported.
>
> Use the PSAP Transfer Directory to look up the correct 10-digit PSAP transfer number for the appropriate PSAP or PSDP. Some PSAPs may have these numbers stored on their phone or computer system.

Press the appropriate key or icon on the 9-1-1 equipment that will provide dial tone from the 9-1-1 network. The label for this key varies depending upon the type of 9-1-1 answering equipment in use at the PSAP. On some equipment the key may be labeled "FLSH" in others it is "TR" in still others it is "HFL". It is important that hands-on training take place at the PSAP to correctly identify the key to be used for this function.

After obtaining 9-1-1 network dial tone, dial the 10-digit PSAP transfer number. The call taker must remain on the line and ensure that an appropriate transfer has been completed and that the ALI information has been received if the dispatch point has enhanced equipment or that the ALI is relayed to dispatch points without enhanced equipment.

Calls can also be transferred to PSDPs that are not on the state network as well as to PSAPs and PSDPs outside of New Jersey. This is done over conventional phone numbers. ANI and ALI information WILL NOT to transferred with these calls. In these cases the sending PSAP may have to remain on the call to assist the receiving PSAP with obtaining information.

Alternate Routing

The New Jersey 9-1-1 Network has the ability to direct 9-1-1 calls to alternate PSAPs in the case of an equipment malfunction or call overflow. PSAPs have pre-determined the number of rings before a 9-1-1 call is re-routed to an alternate PSAP. This varies from PSAP to PSAP so it is important that the telecommunicator know which PSAPs their calls will route to and whose calls will route to their PSAP.

PSAP and PSDP Equipment and Operational Standards

The operational and equipment standards for PSAPs and PSDPs are established in the State of New Jersey 9-1-1 Regulations [N.J.A.C.17:24].

> **📖Objective 8:**
> List the standards and regulations pertaining to PSAP and PSDP operations.

Required Call Taker Position Equipment

The equipment standards dictate that each call taker position must be equipped as follows:

9-1-1 terminal: This unit enables the telecommunicator to receive calls and utilize the advanced features of the 9-1-1 network.

Conference and transfer capability: Keys or icons that on the 9-1-1 terminal that allow the user to perform single button transfers and conferences to other PSAPs and PSDPs and telephones on the public switched network.

ALI Screen: A video screen where the ALI data and telephone number are displayed. The display also lists additional information that may vary depending upon the type of telephone device used to make the call.

Teletypewriter (TTY): The TTY unit must be available at each position and must either provide a printout or electronic display of the conversation.

Required PSAP Equipment

In addition to the equipment required at each call taker position, there is equipment that the PSAP must have:

9-1-1 printer or Electronic media storage: Must be located assessable to the telecommunicators. It will record a log of details about the call after the call is transferred or terminated. In PSAPs using the printer option, complete instructions on reading the 9-1-1 printouts must take place at the PSAP as they are formatted differently depending upon the type of system used in the PSAP.

Instant playback recorders: Instant playback of voice or voice and ALI screen must be available for each call taker who will have direct communications with 9-1-1 callers.

Logging recorder: A logging recorder, connected to each 9-1-1 line or 9-1-1 telephone, that will record and time and date stamp all 9-1-1 calls.

Uninterruptible Power Supply (UPS): This device will offer a degree of protection from power surges and spikes. The capacity of the UPS must be sufficient to keep all 9-1-1 telephone equipment fully operative for a minimum of 15 minutes after normal or auxiliary power fails.

Recommended PSAP Equipment

The following equipment is not mandated by the 9-1-1 Regulations but is recommended:

Emergency generator: The generator will supply reliable auxiliary power to all critical electrical circuits. The generator should be exercised regularly to ensure it is functional when needed.

Lightning protection: It is suggested that a state-of-the-art common ground, ring-type lightning protection system be in place to minimize catastrophic damage and downtime due to electrical storms.

Logging recorder on radio channels and other public safety telephone lines: If the PSAP also serves as a PSDP it is beneficial to maintain an audio record of these messages.

PSAP Staffing Standards

The regulations include the following requirements for the staffing in a PSAP:

- A PSAP must be staffed 24 hours a day, seven days a week.

- The staffing of the PSAP must be sufficient to permit the PSAP to answer all calls within ten seconds, except during the PSAP's average busiest hour during which ten percent of the calls may be answered within twenty seconds.

- Each call-taker and dispatcher position in a PSAP must be staffed by a person certified by OETS as qualified based on successful completion of an OETS approved training course.

- A PSAP serving a community that has a non-English speaking population greater than five percent of the total population must supply language interpretation service. There are two ways this may be accomplished:
  - The PSAP may have a language interpreter available at the PSAP
  - The PSAP may have a language interpreter service available, under contract, by telephone conference call.
- Each call taker and dispatcher in a PSAP is required to receive eight hours of in-service training during each year of service following the initial certification.

PSAP Operations
The 9-1-1 regulations mandate specific standards for answering and transferring 9-1-1 calls:

Call Answering:
- All 9-1-1 calls must be answered with a generic statement such as "9-1-1 where is the emergency?"
  > No specific geographic or jurisdictional location should be mentioned during the call answering message. An answering message such as "Lincoln County 9-1-1 Center, where is your emergency?" is an example of an inappropriate answering message.

  > No specific response agency should be mentioned during the call answering message. "Police 9-1-1 Communications, what is the emergency?" is an example of an inappropriate answering message.

There are several reasons for these standards:
- If a PSAP is regional or county based, callers may become confused when they hear the name of a location other than the jurisdiction where they are physically located.

- A call may be rerouted due to an overflow or other problem and again, the caller may be confused upon hearing a different area mentioned.

- The mention of a specific type of response agency may confuse the caller if the agency mentioned is not the type of response they require.

All 9-1-1 calls must be answered at the PSAP within ten seconds, except during the PSAP's average busiest hour during which ten percent of the calls must be answered in twenty seconds.

Whenever possible and practical, PSAPs and PSDPs responsible for dispatching emergency medical services must provide pre-arrival instructions using Emergency Medical Dispatch guide cards or a protocol system approved by the New Jersey State Department of Health and senior services, Office of Emergency Medical Services.

Call Transfers:

Following the receipt of a 9-1-1 call requiring dispatch of emergency medical, emergency police, or emergency fire services, the PSAP call taker must transfer the caller to the appropriate dispatch agency within 20 seconds for 90 percent of the calls received. If the PSAP also serves as the PSDP with respect to some or all emergency services the call taker must take appropriate dispatch actions within that timeframe.

If the PSAP does not serve as a PSDP or the call was re-routed from another PSAP the PSAP call taker must transfer to the appropriate PSDP. Occasionally, circumstances may require alternate disposition of a call. For example:

- A call received from a person who does not speak English may have to be transferred to a language interpreter service, and the call taker may have to relay the information to the PSDP.

- Call information received via TTY may be relayed to the PSDP by the PSAP call taker.

- The caller may disconnect before the call taker is able to complete the transfer. In this case ALI information and other details received prior to the disconnection may be relayed to the PSDP by the PSAP call taker.

- The receiving PSAP is unable to transfer the caller to the proper PSAP due to equipment problems (trunks down or busy). PSAPs should develop a policy for when to gather information from caller and methods to relay information to proper PSAP.

No "blind transfers" are permitted. The call taker must advise the calling party that the call is being transferred. The call taker must advise the calling party to remain on the line while the transfer takes place. The call taker must remain on the line and ensure that an appropriate transfer has been completed and that the ALI information has been received if the dispatch point has enhanced equipment or that the ALI is relayed to dispatch points without enhanced equipment.

Non-emergency calls:
Occasionally a call will be received on 9-1-1 that is not of an emergent nature. Call takers have two options when this occurs:

- If circumstances permit, the call taker may verbally refer the caller to the appropriate agency for the service required. The caller should not be transferred to another agency on a non-emergent manner.

- The caller may use the fixed transfer key that transfers the caller to the 9-1-1 network prerecorded message pertaining to non-emergency calls.

Redundant Calls:

Some emergency event may result in several callers reporting the same incident. The fixed transfer connection to the 9-1-1 network redundant call prerecorded message may be used when such calls are received. It is essential that the call taker verify that callers are in fact reporting the same incident and that they have no additional information to provide prior to being transferred to the redundant call message.

As an example, if a caller reports an automobile accident on the corner of Main and Oak Streets, subsequent callers must be questioned to ensure they have no additional information such as the status of injured persons before they are transferred to the canned message. Additionally, PSAPs that are not PSDPs or are serving as a regional center may have specific guidelines as to whether subsequent callers will be transferred to the PSDP or to the redundant call message. Finally, call takers receiving follow-up calls from calling parties who are awaiting arrival of emergency response vehicles should make appropriate inquiries to ensure the situation remains as initially reported. The calling party should be transferred to the appropriate dispatch agency if any further developments are being reported.

Abandoned Calls:

At times, a caller may dial 9-1-1 but disconnect prior to being answered at the PSAP. **The 9-1-1 regulations do not specify how individual PSAPs handle such calls. It is important that the PSAP establish a standard procedure outlining how such calls should be handled.** Call takers are alerted to abandoned calls in varying ways dependent upon the type of 9-1-1 equipment used in the PSAP. Training on how abandoned calls are delivered and handled should take place in the PSAP.

While some abandoned calls may be the result of misdialing or pranks it should be remembered that there is always the chance that the nature of the emergency may have resulted in the premature disconnect. Appropriate follow up on such calls has resulted in lives being saved.

> **Follow up on Abandoned Calls Pays Off**
>
> In North Brunswick, Middlesex County, a caller trying to report a burglary in progress had the telephone line cut before the call taker picked up the line. A patrol unit was dispatched based upon the ALI received and an apprehension of a person armed with a knife was made.
>
> In the City of Bayonne, in Hudson County, a call taker was able to send emergency medical aid even though the calling party simply stated "sick, emergency" before hanging up. The ALI information was appropriately transferred to the emergency medical dispatch point for action. An unconscious male was located at the location provided.

Reading the ALI Monitor

The information provided on the ALI monitor for enhanced 9-1-1 calls provides benefits to the telecommunicator, the emergency responders and the public. All of New Jersey's PSAPs receive the ALI data in the same format regardless of the type of call answering equipment used in the facility. Initially all calls were from standard telephones from a fixed location requiring only occasional warning messages to alert the call taker of special information about the telephone service from which the call is was being placed. As technological advances took place it was necessary to modify the information provided to accommodate calls received from wireless devices, out-of-state call centers, and Voice over Internet Protocol (VoIP) services.

The following section will thoroughly review the format of the information displayed on the ALI monitor and explain and the significance of that information.

Wire line ALI Screen

	Line 1
856-555-4522 19:30:34 1-27-01	Line 2
SMITH, RONALD	Line 3
000215 N ATLANTIC	Line 4
AVE	Line 5
	Line 6
LAUREL SPRINGS BORO NJ	Line 7
	Line 8
RESD	Line 9
	Line 10
PILOT #856-555-4522 ESN 1465	Line 11
CAMDEN CO COMMUNICATIONS	Line 12
LAUREL SPRINGS PD 856 783-4900	Line 13
LAUREL SPRINGS FD 856-783-4444	Line 14
LAUREL SPRINGS EMS 856-783-4444	Line 15
LEC BELAT	Line 16

Figure 12: sample wireline ALI screen

LINE #1   CAUTION MESSAGE
LINE #2   ANI(NPA, NXX, L Figure 8: Standard wire line ALI screen
LINE #3   SUBSCRIBER NAM
LINE #4   ST #, ST NUMB TRAILER, ST NAME PREFIX, ST NAME

```
LINE #5    ST NAME(CONT), ST NAME SUFFIX, ST NAME TRAILER DIR
LINE #6    LOCALITY
LINE #7    MUNICIPALITY, STATE
LINE #8    BUILDING ID
LINE #9    UNIT IND, UNIT #, FLOOR IND, FLOOR #, CLASS OFSERVICE
LINE #10   BLANK LINE
LINE #11   PILOT NUMBER (MAIN BILLING NUMBER), ESN
LINE #12   NAME OF PSAP
LINE #13   NAME OF POLICE AGENCY, 7-DIGIT POLICE NUMBER
LINE #14   NAME OF FIRE AGENCY, 7-DIGIT FIRE NUMBER
LINE #15   NAME OF EMS AGENCY, 7-DIGIT EMS NUMBER
LINE #16   LEC INFORMATION
```

Line 1: Line 1 will be blank if there is no warning associated with the telephone service. The most common caution messages on wireline calls are on Page 56.

Line 2 displays the calling party's telephone number (ANI), the date and time of the call. See the above for caution messages that may pertain to the ANI displayed on this line.

Line 3 displays the name of the person who subscribes to the telephone service. The call-taker must verify the name of the person calling since this may or may not be the same person who subscribes for the service.

Line 4 lists the street address information pertaining to the telephone being used. The following items are found on this line:

> Street number

> Street number trailer - a letter or other number attached to the street number.

> Street name prefix - a letter or letters which precede the street name and which usually indicate a direction such as "N" for north or "SW" for southwest.

> Street name

Line 5 lists additional street address information as follows:

> Continuation of street name when needed.

> Street name suffix - a standardized abbreviation such as "ST" for STREET or "BLVD" for BOULEVARD.

> Street name trailer - a letter or letters that follow the street name suffix which usually indicate a direction such as "N" for north or "SW" for South West.

Line 6 may list the locality associated with the address. Not all addresses have a locality associated with them. A locality is a name assigned to a postal delivery area that may encompass several municipalities and in some cases cross county boundaries.   The name may be that of a municipal jurisdiction or a section of a municipal jurisdiction.

Line 7 lists the name of the municipality and the state for the address.

Line 8 lists the building or complex name associated with the address if applicable.

Line 9 supplies two types of information:

    1)   More specific location information such as building number and floor number.

    2)   Class of service: the following are some of the more commonly encountered class of service codes for wire line calls:

        RESD - indicates the caller has residential telephone service.

        BUSN - indicates the call is from a telephone that has business service.

        COCT - indicates the call is being made from a privately owned pay telephone.

        COI2 - indicates the call is being made from a pay phone owned and operated by Verizon.

There are several others that indicate specific types of phone service such as those with various types of CENTREX service. There are specific Class of Service codes associated with VoIP and wireless calls which will be reviewed later in this unit.

Line 10 is blank

Line 11 contains the pilot number of the calling party's telephone service and the Emergency Service Number (ESN) for the address.

A pilot number is a telephone number for the main service from a location. If a residence has "teen phone" service the number for the teen phone would be listed on line 2 of the ALI monitor and the main number for the residence would be listed as the pilot number.

As mentioned in the section on caution messages, several types of business telephone systems have a main number and several extensions from the main number. In such a case, the pilot number would list the main billing number and the ANI, listed on line 2, would indicate the outgoing trunk from which the call was made.

An Emergency Service Number (ESN) is a number that defines a geographic area with a specific set of emergency service providers. All municipalities have a default ESN, used to route calls with addresses that don't match the database and the other that reflects the response agencies for the area. Each ESN is programmed to deliver the calls made from within its boundaries to a specific PSAP (or alternate PSAPs in the event of an overflow).

Line 12 lists the name of the PSAP assigned to the caller's ESN.

Lines 13 through 15 list the emergency response agencies for the calling party's location. These are the locations to which the call may be transferred using the selective transfer function keys. The ten-digit numbers for the agencies listed are not the numbers the call is being transferred to, but may assist the call-taker should a problem be encountered in transferring the call using the single button assigned for that service. If the caller is reporting an incident that occurred in another ESN, the call must be transferred using speed-dial or other transfer method. **The F-1 Police, F-2 Fire and F-3 EMS transfer keys will only transfer to the agencies currently displayed on the ALI screen.**

Line 16 provides information about the Local Exchange Carrier (LEC) that provides the local telephone service for the subscriber:

Local Exchange Carrier (LEC) Identification:

The Federal Communications Act of 1996 opened the local telephone service market to competition. Regardless of the LEC from which a customer obtains service, the 9-1-1 call is routed to a PSAP over the established 9-1-1 network.

The LEC identification consists of up to five alpha/numeric characters abbreviating the full name of the LEC providing service to the customer. This information may be used for directing database errors to the appropriate carrier and for tracking trouble reports. A listing of all authorized LECs in New Jersey, as well as contact information, can be found on the OETS Internet Site: www.state.nj.us/911 or OETS can be contacted by telephone at 609-777-3950. In addition there is the NENA Company ID file: http://www.nena.org/?page=CompanyID. This list includes companies that offer service from outside of the state and may not appear on the OETS list.

Wire line ANI/ALI Error Message Screens

```*NO RECORD IN DATABASE*``` ```908-555-1432 09:30:34 11-25-12```	Line 1
	Line 2
	Line 3
	Line 4
	Line 5
	Line 6
	Line 7
	Line 8
	Line 9
	Line 10
	Line 11
	Line 12
	Line 13
	Line 14
	Line 15
	Line 16

Figure 13 sample NO RECORD FOUND ALI screen

It is the responsibility of each telephone service provider to forward subscriber information to the Verizon DMC to be included in the 9-1-1 database. While every attempt is made to ensure that the data is entered when the telephone service is activated, situations may arise where the data has not been entered but the service is on. In such cases the ALI screen will only contain a warning message on line 1 and the caller's number with the date and time of the call on line 2.

As there is no database record for this telephone number, the rest of the fields on this screen are blank. When this type of call is received, the Verizon DMC should be notified using a *PSAP Inquiry Form* *(see Attachment 1) faxed to the Verizon DMC at 800-637-9173. When circumstances allow, the caller should be questioned to determine the correct address and service provider information which should be entered in section 2 of the Inquiry form. If the call is of a nature where such information cannot be obtained, that should be noted on the inquiry form.

With this type of call, the caller must be thoroughly questioned to determine the location information normally presented on the ALI screen. If the call must be transferred for police, fire or medical dispatch the call taker must dial the transfer number, the selective transfer keys will not function.

`*CAUTION ANI FAILURE*`	`Line 1`
`200-911-0906  09-:30:34  11-25-12`	`Line 2`
	`Line 3`
`CARRIER: MCI METRO`	`Line 4`
`SERVING OFFICE:`	`Line 5`
`PISCATAWAY, NJ`	`Line 6`
`PSWYNJO1234`	`Line 7`
	`Line 8`
	`Line 9`
`TO CONTACT CARRIER CALL:`	`Line 10`
`1-800-555-1234`	`Line 11`
	`Line 12`
	`Line 13`
	`Line 14`
	`Line 15`
	`Line 16`

Figure 14 sample ANI failure

For both wire line and wireless 9-1-1 calls, the data presented on the ALI screen is associated with the telephone number (ANI) from which the call is made. Occasionally a problem will occur and the telephone number is not transmitted to the database. In this case the call taker will see an ANI failure screen. The caution message on line 1 clearly states that an ANI failure has occurred. Line 2 displays a code that indicates which provider originated the ANI failure as well as the date and time the call was received. Lines 4 through 7 provide information regarding the carrier and the central office for the call in question. If there is no record for the carrier in the database line 10 will state "Call 9-1-1 Control Center" when there is a record this line states "To Contact Carrier Call:". Line 11 provides the telephone number for the carrier providing telephone service for the caller. This number can be used to advise the carrier of the trouble.

These calls will be routed to either a county PSAP, State Police PSAP or regional PSAP based upon the telephone trunk group that carried the call. The caller must be questioned to determine the information normally provided on the ALI screen. There is no transfer capability using the police, fire or medical transfer keys since these transfers are selective based upon the assigned ESN and there is no ESN assignment on an ANI failure. If the caller is unable to speak or the call is abandoned, the carrier or the control center may be contacted to see if any information can be determined to identify the source of the call. Wi

> *PSAP Inquiry Forms:*
> *This form is used to alert the DMC or the telephone service provider of omissions or errors in the database. An Inquiry Form should be completed whenever the location information displayed on the ALI screen is incorrect or in the case of no record found in the database.* **The form should be faxed to the LEC responsible for the customer's record or the Verizon DMC for no record found calls.**

Wire line ALI Screen, Special Circumstances

In designing the network, it was decided that in certain circumstances it would be a benefit to have someone be able to call directly into the PSAP over the 9-1-1 lines from outside of New Jersey. The most likely was telephone operators which resulted in the creation of "operator service numbers". If a person dialed "0" and was connected to an operator outside of the state, the operator would be able to connect the caller to the PSAP over the 9-1-1 network. Unfortunately, there would be limited information available on the ALI screen. They are identified as "3rd Part Conference" calls.

CAUTION 3RD PARTY CONFERENCE	Line 1
908-250-4699 19:30:34 1-27-09	Line 2
3RD PARTY CONFERENCE	Line 3
000000 UNKNOWN ADDRESS	Line 4
	Line 5
	Line 6
UPPER DEERFIELD NJ	Line 7
	Line 8
	Line 9
	Line 10
PILOT # 908-250-4699 ESN 1792	Line 11
CUMBERLAND COUNTY COMM	Line 12
NJSP BRIDGETON 856 235-1000	Line 13
UD TWP FIRE 3 856 933-0555	Line 14
UD TWP EMS 856 969-3128	Line 15
LRC VEZ	Line 16

Figure 15 sample shoes 9-1-1 call transferred into network from outside of the state.

Each municipality in the state was given a number that could be dialed from anywhere that would be answered at its Primary PSAP. It was also made available to service providers such as "OnStar and medical

alarm companies. The condition was that the provider would receive a phone call from the customer and would be able to conference the call with the PSAP allowing them to interrogate the caller directly. No automatic alarms, phone calls only.

Wireless ALI Screens:

There are currently three phases of wireless 9-1-1 service. Each of these phases will provide different information on the ALI screen. In this review only areas that vary from the information found on the wire line screens will be examined.

Wireless Default Screens:

All of the wireless carriers have completed modifying their systems to deliver wireless Phase 2 (WPH2) information. However, some calls may still be received that are not Phase 2 capable and will be delivered with a slightly enhanced Phase 0 service as show in Figure 11. This may be because the call is processed through a new tower that has not yet had the Phase 2 routing information programmed or because both of the trunks that carry calls for the service provider are unavailable. All calls processed in this manner are generally routed to a single site for each county. In areas with a county PSAP the calls will be routed there. In places where there is no county PSAP the calls may be routed to the New Jersey State Police PSAPs or large municipal or regional PSAPs. Since there is only a single default screen for each county or region, no specific cell site information is provided.

```
* WRLS PH1 *                        ← Line 1
908-555-2345 09:30:34   12-08-08    ← Line 2
PCS/WIRELESS SERVICES PROVIDER      ← Line 3
000001          ADDRESS UNKNOWN     ← Line 4
                       ST           ← Line 5
PCS/WIRELESS DEFAULT                ← Line 6
BURLINGTON COUNTY            XX     ← Line 7
                                    ← Line 8
           FLR          WRLS        ← Line 9
                                    ← Line 10
ESRD # 908-250-7112     ESN 5404    ← Line 11
BURLINGTON CO COMM 609  265-1000    ← Line 12
F1=NJSP BRDNTN     609  298-1170    ← Line 13
F2=PENNSYLVANIA SP 215  493-4011    ← Line 14
F3=PHILADELPHIA PD 215  686-3128    ← Line 15
                  LEC  VRZWL        ← Line 16
```

Figure 16: sample Wireless default ALI screen

The caution message on line 1 of Figure 11 states "WRLS PH1" alerting that this is not a call capable of Phase 2 service. The caller's wireless telephone number will be found on line 2 along with the date and time of the call. Because this is a generic screen used throughout a region, no specific information regarding the location of the cell site processing the call is supplied. Lines 3 through 7 will only indicate that the address is unknown and that the site is somewhere in the jurisdiction of the PSAP receiving the call. The field on line 7 that normally displays "NJ" for the

State of New Jersey will display "XX" for all wireless calls. Listing the state as XX serves two purposes:

- It allows addresses that do not exist to be entered into the database. Normally, all addresses entered into the database are compared to the New Jersey Master Street Address Guide (MSAG) to ensure that the address is a legitimate location in the state. Quite often the addresses listed on wireless calls are not true street addresses; rather they are sites where no true address is assigned. By assigning the pseudo state of XX to the address the database will not reject these address assignments.

- A second reason for listing the state as XX is that it helps to remind the call taker that the call may not be from a caller in New Jersey. Because wireless signals can travel some distance before hitting a cell tower, calls have been received in New Jersey PSAPs that are from callers in New York, Pennsylvania, Delaware or Connecticut.

On Line 9, the class of service is listed as "WRLS" indicating that this is a wireless call that does not have true Wireless Phase 1 service. In order to be classified as a Phase 1 call the ALI would have to provide the location of the cell tower as well as the calling party's number. On default screens only the caller's number is available.

Line 11 lists the Emergency Service Routing Digits (ESRD) used to route the call to the PSAP. Although this looks like a regular telephone number, it is not a number that can be dialed to reach the caller. It is a specially assigned number used by the wireless network to route the call to the correct PSAP.

The selective transfers listed on lines 13 through 15 are assigned differently than those assigned for wire line calls. On wire line calls the selective transfers are programmed to go to the jurisdiction's police, fire or medical dispatch agency. **For wireless calls, the transfers are programmed to go to three alternate PSAPs.** This is done because wireless calls may come from callers in an area outside the jurisdiction where the call is received and this will allow for rapid transfer to agencies that may not already be in the PSAP's speed dial list.

Line 16 shows the LEC that provides the ALI information.

Wireless Phase 1:

```
* WRLS PH1 *                         ← Line 1
911-789-2345 09:30:34   12-08-03     ← Line 2
VERIZON WIRELESS                     ← Line 3
000088        DENNISVILLE            ← Line 4
                      ROAD  NE        ← Line 5
RADIUS  5 MILES                       ← Line 6
MIDDLE TWP                 XX         ← Line 7
+039.073200  -74.492600              ← Line 8
                       WPH1          ← Line 9
                                     ← Line 10
ESRD # 609-511-4000     ESN 5404     ← Line 11
NJSP ODU – SOUTH COMM 4              ← Line 12
F1=GS PKY BASS RVR 609  296-2031     ← Line 13
F2=MIDDLE TWP PSAP 609  465-8700     ← Line 14
F3=LOWER TWP PSAP  609  886-2711     ← Line 15
              LEC  VRZWL             ← Line 16
```

Figure 17: sample Wireless Phase I ALI screen

Line 1 displays *WRLS PH1* the warning message that this is a Phase 1 call that is not capable of Phase 2 service.

Line 2 displays the calling party's call back number if the wireless device has a service plan. If the device does not have a service plan, the number displayed will be a surrogate number. A surrogate number is only useful to identify the unit making the call but is not a dialable number. All surogate numbers start with the digits 911 and then seven digits of the unit's electronic serial number. These numbers are used for wireless phones "out of the box", no longer have a service plan, phones from carriers without roaming agreements, and those that are turned over to community programs.

Line 3 lists the name of the service provider for the caller's telephone, lines 4 and 5 list the address information for the cell tower processing the call. Sometimes this will be a valid street address and other times the address may have a street number assigned that does not fall in the range of numbers that actually exist in the jurisdiction. Additionally, the street name directional suffix (NE is the directional suffix in figure 12) indicates the direction of the cell site antenna that is processing the call.

Line 6 lists the cell site's coverage radius. This area is an approximation and the caller may not necessarily be within the radius listed.

Line 8 provides the latitude and longitude of the cell tower processing the call.

Line 9 shows that this is a Phase I Class of Service.

Lines 10 through 16 are the same as the WRLS ALI screen.

Wireless Phase 2:

```
* WRLS PH2 *                       ← Line 1
973-555-2345 09:30:34   12-08-03   ← Line 2
AT&T WIRELESS                      ← Line 3
000000655        ABSECON           ← Line 4
                      BLVD  SE     ← Line 5
RADIUS 04 MILES                    ← Line 6
ATLANTIC CITY                XX    ← Line 7
+039.3655560  -074.424450          ← Line 8
UNC:0000150     67%         WPH2   ← Line 9
                                   ← Line 10
ESRD # 609-511-6545      ESN 5935  ← Line 11
ATLANTIC CITY PD                   ← Line 12
F1=EGG HARBOR CITY 609  235-1000   ← Line 13
F2=PLEASANTVIL     609  933-0555   ← Line 14
F3=AC EXPRESSWAY   609  969-3128   ← Line 15
              LEC  AWS             ← Line 16
```

Figure 18: sample Wireless Phase II ALI screen

When a call is received with wireless Phase 2 information, as show in Figure 13, line 1 simply displays "WRLS PH2". There are several warning messages that may be received for calls that are capable of Phase 2 but for some reason arrived with Phase 1 information these screens will be reviewed later in this unit.

As with wireless Phase 1 calls, lines 3 through 7 provide information regarding the wireless carrier providing service for the caller and the location of the cell tower.

The latitude and longitude listed on line 8 provide an approximate location of the caller. The address lines (4 and 5) are still the cell tower and most of the time not change with the rebid. **However, for some carriers, if the cell tower processing the call changes this may display when the call is rebid.**

On line 9 the uncertainty and confidence factors are listed. This information notifies the call taker as to the distance the caller might be from the latitude and longitude supplied, and how certain the wireless service provider is that the caller may be in that area. It is also important to note that the Class of Service on line 9 is WPH2 which indicates that this is a true Phase 2 call. Figure 14 is a graphical demonstration of this information as shown on the ALI screen in figure 13.

Lines 10 through 16 are the same as the WRLS ALI screen.

Estimated Latitude and Longitude delivered to the PSAP.

Caller's actual location

Area of uncertainty: For the ALI screen shown, there is an estimated 67% confidence level that the caller is within a 150 meter radius of the coordinates provided

Radius = 150 Meters
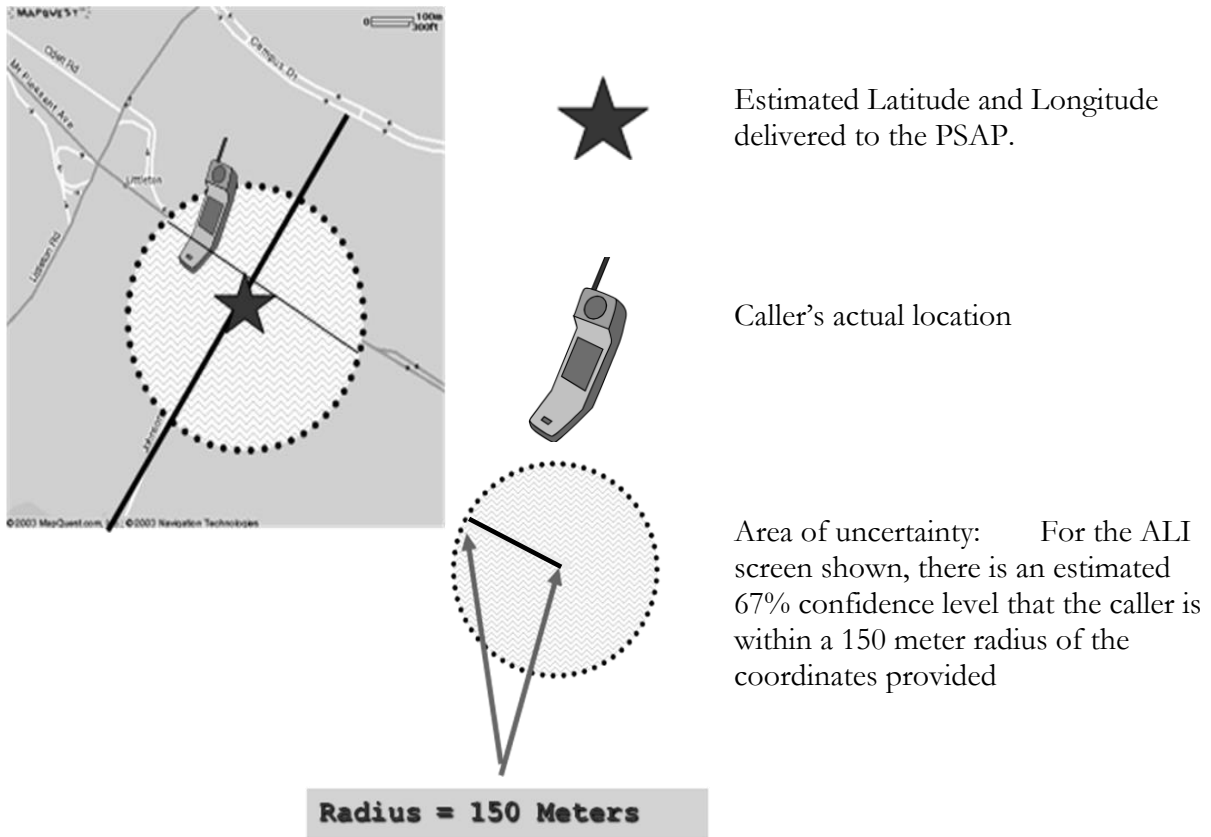
Figure 19: Uncertainty and Confidence factors

Figure 13 shows a wireless Phase 2 screen when all of the technology has worked as expected. Unfortunately, this is not always the case. Many calls that are capable of providing Phase 2 information may be initially delivered to the PSAP with Phase 1 data or may be missing some of the Phase 2 information. The PST is alerted to this situation by the caution messages on line 1 of the ALI screen show in figure 14.

```
* WRLS PH2 LAT/LONG NOT AVAIL*       ← Line 1
973-555-2345  09:30:34    12-08-03    ← Line 2
AT&T WIRELESS                         ← Line 3
000000655        ABSECON              ← Line 4
                      BLVD   SE       ← Line 5
RADIUS 04 MILES                       ← Line 6
ATLANTIC CITY                  XX     ← Line 7
+039.3654000   -074.425222            ← Line 8
UNC:              %          WPH1     ← Line 9
                                      ← Line 10
ESRD # 609-511-6545      ESN 5935     ← Line 11
ATLANTIC CITY PD                      ← Line 12
F1=EGG HARBOR CITY 609  235-1000      ← Line 13
F2=PLEASANTVIL     609  933-0555      ← Line 14
F3=AC EXPRESSWAY   609  969-3128      ← Line 15
                  LEC  AWS            ← Line 16
```

Figure 20: Wireless Phase 2 capable ALI screen with caution message.

Wireless Caution Messages:

These caution messages alert you that the call may be capable of Phase 2 service and that action can be taken to retrieve that information. The action required is known as a "rebid". This is a function performed by the 9-1-1 telephone equipment in the PSAP when the call taker presses the rebid key or icon on the answering equipment. The label for this function varies depending upon the vendor providing the answering equipment. Some of the names for the rebid function include: retransmit, ALI, resend, ALI request. Training on this function must take place at the PSAP. When the rebid function is performed, the equipment sends the calling party's number along with the ESRD back to the wireless network to attempt to retrieve the Phase 2 data. Occasionally this may require more than one rebid. **It is important to wait approximately 30 seconds between each rebid otherwise the signals may not go through properly.** When the rebid has been successful the ALI screen will refresh, the caution message will change to "*WRLS PH 2*, the latitude and longitude will update to the caller's location, the uncertainty and confidence fields will be filled and the class of service will change to WPH 2.

VoIP ALI Screens

Here we will examine examples of ALI screens displayed for stationary and nomadic services. The technology for these services and the VoIP mobile services are still under development. You may find that the screens delivered with calls through these services may vary depending upon the provider.

Stationary VoIP:

Many providers of this service will route calls in the same manner as the traditional landline telephone providers using the MSAG. Such calls will appear as in figure 15.

```
LINE 1   →
LINE 2   → ‖ 856-555-4522   19:30:34 1-27-01
Line 3   → ‖ JONES,    RONALD
Line 4   → ‖ 000215                  ATLANTIC
Line 5   → ‖                              AVE
Line 6   → ‖
Line 7   → ‖ LAUREL SPRINGS BORO          NJ
Line 8   → ‖
Line 9   → ‖                            RESD
Line 10  → ‖
Line 11  → ‖ PILOT #  856-555-4522  ESN 3048
Line 12  → ‖ CAMDEN COUNTY COMMUNICATIONS
Line 13  → ‖ LAUREL SPRINGS PD  856-783-4900
Line 14  → ‖ LAUREL SPRINGS FD  856-783-4444
Line 15  → ‖ LAUREL SPRINGS EMS 856-783-4444
Line 16  → ‖                       LEC  CMCST
```

Figure 21: sample Stationary VoIP ALI Screen

Lines 1 through 15 appear the same as traditional landline telephone service.

Line 16 displays the LEC. This is the only indication that this may be a VoIP provider. When you look up the ID it shows a company that does not provide traditional telephone service in your area.

Nomadic VoIP:

```
Line 1   →
Line 2   → ║ 856-555-4522   19:30:34 1-27-09
Line 3   → ║ VOIP CALLER
Line 4   → ║ 000001         VOIP CALL
Line 5   → ║                          ST
Line 6   → ║
Line 7   → ║ LAUREL SPRINGS BORO       NT
Line 8   → ║
Line 9   → ║                         RESD
Line 10  → ║
Line 11  → ║ ESRD   908-211-4522    ESN 0048
Line 12  → ║ CAMDEN COUNTY COMMUNICATIONS
Line 13  → ║ LAUREL SPRINGS PD  856-783-4900
Line 14  → ║ LAUREL SPRINGS FD  856-783-4444
Line 15  → ║ LAUREL SPRINGS EMS 856-783-4444
Line 16  → ║                     LEC  INTRA
```

Figure 22: sample Nomadic VoIP Service Default ALI Screen

To implement "nomadic" VoIP service "shell records" where built for each municipality shown in figure 16. Like a default wireless ALI screen this allows the caller to be directed to the correct PSAP even if there is no information available from the VoIP provider.

Line 2 shows the caller number, time and date.

Line 16 shows the VoIP provider.

It is the responsibility of the VoIP provider to provide the data and the routing to fill lines 1 through 10 on the ALI screen. The "nomadic" VoIP ALI screen combines the appearance of a landline call and a wireless call. The ability to recognize this becomes more critical as industries combine the functions of traditional telephone, wireless, internet based, broadband and other technologies to provide communications.

When a PSAP answers a 9-1-1 from a "nomadic" VoIP provider the screen appears as in figure 22.

```
Line 1   → ║ *VOIP VPC CALL*
Line 2   → ║ 856-342-3426    08:25:34 1-27-09
Line 3   → ║ TAYLOR STEPHEN
Line 4   → ║ 000011          WILLOW
Line 5   → ║                              WK
Line 6   → ║
Line 7   → ║ CAMDEN CITY                  NT
Line 8   → ║ +039.910871  -075.110794
Line 9   → ║ UNC:           %         VOIP
Line 10  → ║
Line 11  → ║ ESRD #856-211-1000    ESN 1377
Line 12  → ║ CAMDEN CITY PD
Line 13  → ║ CAMDEN CITY PD     856-757-7400
Line 14  → ║ CAMDEN CITY FD     856-752-7400
Line 15  → ║ CAMDEN CITY EMS    856-783-4444
Line 16  → ║                       LEC  INTRA
```

Figure 23: sample Nomadic VoIP call with subscriber ALI

Line 1 the warning line indicates that this is a VoIP call.

Line 2 shows the caller's number, date and time.

Line 3 shows the customer name.

Lines 4 and 5 display the address.

Line 6 is blank

Line 7 displays the municipality; the state will appear as "NT" not "NJ".

Line 8 displays the latitude and longitude of the address appearing on lines 4 and 5.

Line 9 uncertainty and confidence may not be provided; the Class of Service is VOIP.

Line 10 is blank

Line 11 displays the routing digits (ESRD or ESQK) and the ESN.

Lines 12 through 16 show the PSAP, fixed transfers and LEC in the same manner as a traditional landline telephone.

```
Line 1  → | *VOIP VPC TIMEOUT-REBID*
Line 2  → | 856-555-4522    19:30:34 1-27-09
Line 3  → | VONTAGE
Line 4  → | 000001          VOIP
Line 5  → |                              ST
Line 6  → |
Line 7  → | CAMDEN CITY                  NT
Line 8  → | VOIP SHELL RECORD
Line 9  → | UNC:            %         VOIP
Line 10 → |
Line 11 → | ESRD  856-211-1000     ESN 1377
Line 12 → | CAMDEN CITY PD
Line 13 → | CAMDEN CITY PD     856-757-7400
Line 14 → | CAMDEN CITY FD     856-752-7400
Line 15 → | CAMDEN CITY EMS    856-783-4444
Line 16 → |                     LEC  INTRA
```

Figure 24: sample Nomadic VoIP ALI Warning Message

Because these calls must route through a VPC, there is a chance that the ALI data may not arrive with the call shown in figure 18. In such cases the caution message on line 1 will alert the PST to use the re-bid function to update the ALI screen. (Figure 19)

Anomalies on VoIP ALI Screens

It has been noticed that some of the VoIP providers are displaying information on the ALI screen that does not match the format of the New Jersey 9-1-1 network.

Street names such as US HWY NO 130 may appear as Route 130. The suffix AVE as Avenue.

Local or regional names may appear in place of actual municipal names. The designation BORO, TWP, CITY or the like may be omitted resulting in routing errors.

Routing base on post office delivery and not the municipality have occurred.

VoIP Default Routing:

In the event that a 9-1-1 call on a VoIP service cannot be routed for any reason each provider has designated "call centers' that will answer this call. The "call center" will attempt to locate the caller and transfer them to the correct PSAP. In New Jersey this may be accomplished by using the method described in the **Reading the ALI Monitor** section of this book, **"3rd PARTY CONFERENCE".**

```
LINE 1   →   *CAUTION* 3RD PARTY CONFERENCE
LINE 2   →   908-250-4699   19:30:34 1-27-09
Line 3   →   3RD PARTY CONFERENCE
Line 4   →   000000     UNKNOWN ADDRESS
Line 5   →
Line 6   →
Line 7   →   UPPER DEERFIELD            NJ
Line 8   →
Line 9   →
Line 10  →
Line 11  →   PILOT # 908-250-4699   ESN 1792
Line 12  →   CUMBERLAND COUNTY COMM
Line 13  →   NJSP BRIDGETON    856   235-1000
Line 14  →   UD TWP FIRE 3     856   933-0555
Line 15  →   UD TWP EMS        856   969-3128
Line 16  →                         LEC   VEZ
```

Figure 25: sample 3rd PART CONFERENCE ALI Warning Message

Line 1 indicates that this call has been transferred to the PSAP from outside of the State of New Jersey.

Line 2 shows the "Operator Service Number" used to transfer the call to the PSAP. This will match the PILOT # displayed on Line 11 along with the time and date. There is an OSN for each municipality on New Jersey.

Line 3 displays "3rd PARTY CONFERENCE" rather than the calling party or customer.

Line 4 will display no valid address or location.

Lines 5 and 6 are blank.

Line 7 displays the municipality the person transferring the call believes the caller to be located. This is based on the information the caller has given them.

Lines 8, 9 and 10 are blank.

Line 11 will display the number used to transfer the call to the PSAP and the default ESN for the municipality chosen.

Lines 12 through 16 will display the PSAP and fixed transfers for the default ESN.

Wireless/VoIP ALI Screens Combinations

Automobile manufacturers are offering vehicle telemetry services that can utilize both wireless and VoIP technology. In the event of a collision some may use the occupant's cell phone to call 9-1-1 which can allow the PSAP to speak directly to the person in the vehicle and have a chance to obtain a Phase II location. Others may use a cell phone built into the vehicle to call an operator service. These operators can speak to the person in the vehicle and provide assistance. In addition, they may be able to transfer the caller to the local PSAP based on the location provided by the on-board GPS system. This transfer can be done using "3rd PARTY CONFERENCE", as show in figure 19, or a VoIP interface that provides the name and callback number of the service and the latitude and longitude of the vehicle shown in figure 20.

```
Line 1   →   *VOIP VPC CALL*
Line 2   →   866-866-5002   19:30:34 1-24-12
Line 3   →   ONSTAR TELEMATICS CALL CENTER
Line 4   →   000000
Line 5   →
Line 6   →
Line 7   →   DENVILLE TWP                 NJ
Line 8   →   +040.881633 -074.488445
Line 9   →   UNC:0000000      %          VOIP
Line 10  →
Line 11  →   ESRD  856-511-1365     ESN 0294
Line 12  →   DENVILLE PD
Line 13  →   DENVILLE PD        973-627-4900
Line 14  →   MAIN ST RFC #1     973-627-4900
Line 15  →   MAIN ST RESCUE CO1 973-627-4900
Line 16  →                          LEC  INTRA
```

Figure 26: sample Wireless/VoIP ALI screen vehicle telemetry provider

On this ALI screen Line 1 warns that this is a VoIP call.

Line 2 shows the callback number of the service provider, not the subscriber, along with the time and date.

Line 3 shows the name of the service provider.

Lines 4 and 5 are blank as there is no address to provide.

Line 7 shows the municipality that the latitude and longitude indicates.

Line 8 displays the latitude and longitude obtained from the vehicles on board GPS. The service provider may be able to allow the PSAP to speak directly to the vehicle occupants as well as provide information about the incident and occupants that will not display on the ALI screen.

Line 9 the uncertainty and confidence fields may be blank, the COS will display VOIP. While the call started as a wireless call to the service provider it is transferred to the PSAP as a VoIP call.

Lie 10 is blank.

Line 11 displays the routing digits used to send the call to the PSAP and the default ESN for the municipality.

Lines 12 through 16 will show the PSAP and fixed transfers for the default ESN.

```
Line 1   →   *VOIP VPC CALL*
Line 2   →    609-610-0676 12:30:34 04-26-16
Line 3   →   MARS, CHARLES-MOBILE RAPIDSOS
Line 4   →   000001           ACADEMY      DR
Line 5   →
Line 6   →    RSOS CARCRASH ACC 20M
Line 7   →   WESTAMPTON TWP                 NJ
Line 8   →   +040.016338 -074.816186
Line 9   →   UNC:              %           VOIP
Line 10  →
Line 11  →   ESRD   856-211-4265     ESN 1112
Line 12  →   BURLINGTON CO COMM
Line 13  →   WESTAMPTON TWP PD   609-267-8300
Line 14  →   BURL CO FIRE DISP   609-267-8300
Line 15  →   BURL CO EMS DISP    609-267-8300
Line 16  →                         LEC   BAND
```

Figure 27 9-1-1 call made for a cell phone using an APP that appears as a VoIP call.

This 9-1-1 call was made using an app available from the service provider's app website. When activated the app places a wireless 9-1-1 call using VoIP technology to provide the name of the person registered on the device, the call back number and offers an address based on the latitude and longitude determined by the location software on the device. The routing is based on wireline not wireless routing even though a cell phone is being used to place the call.

Cell Service Extenders

In some areas where wireless phone service is poor or none existent the wireless provider may offer a device that will act like a miniature cell tower. The subscriber places this device in their home or business and connects it to the internet. The subscriber then connects their wireless phones to the device and it will allow only those phones to use the device. When a 9-1-1 call is made the ALI screen, shown in figure 21, may look like a typical wireless Phase II call with one exception. The address displayed will be the callers, since the location of the "tower" is the same as the caller and the location information is maintained in the provider's database. There is no need to search for the caller using satellite or network solutions used in traditional cell phone calls. Coverage is usually a matter of 15 to 20 feet so it is considered reasonable to use the address.

```
* WRLS PH2 *                        ← Line 1
609-789-2345 11:45:34   12-08-11    ← Line 2
FIXED ATTMO 8006356840 OPT4         ← Line 3
000002388        LINDEN             ← Line 4
                        AVE         ← Line 5
                                    ← Line 6
WATERFORD TWP                 XX    ← Line 7
+039.771838  -074.851956            ← Line 8
UNC:0000109     90%          WPH2   ← Line 9
                                    ← Line 10
ESRD # 609-511-5723      ESN 5445   ← Line 11
CAMDEN CO COMUNICATIONS             ← Line 12
F1=NJSP TURNPIKE 856    235-1000    ← Line 13
F2=NJSP BELLMAWR    856 933-0555    ← Line 14
F3=PHILADELPHIA PD  215 686-3128    ← Line 15
                    LEC  ATTMO      ← Line 16
```

Figure 28: sample Wireless/VoIP miniature cell site

Line 1 warns that this is a wireless Phase II call.

Line 2 shows the callback number of the subscriber along with the time and date.

Line 3 may show the name of the customer or the service provider and a series of numbers and letters after. This depends on the service provider. In this sample the 10 digits are the phone number of the provider's security service and "OPT4" means to press number 4 on the phone when you reach the automated attendant. Use this if there are any questions or problems with the connection or the call.

Lines 4 an5 are the address of the miniature cell tower and the subscriber. In the event of a "hang up" this address can be used as the location of the caller. At present this is the only time that the address displayed on the ALI screen of a wireless 9-1-1 call can be used in this way. (Figure 21)

Lines 6 through 16 will appear like a wireless call.

Or the screen may look like a VoIP call. It depends on how the service provider chooses to deliver the call. An uninitiated cell phone (one with no active service plan) can use these sites to call 9-1-1. Because the coverage area is so small they will be very close but not necessarily at the location on the ALI screen.

Wireless over Wi-Fi

In areas where the wireline service has degraded some carriers are implementing a wireless service that looks and acts like traditional wireline but uses wireless technology to provide the service. A device is placed in the customer's home and traditional telephones can be connected to existing wire connections. The customer will hear a "dial tone" when they use the phone.

The connection will be over wireless voice and/or data networks like a cell phone. Carriers may provide 9-1-1 service using wireless methods or VoIP. With the VoIP service the customer will be responsible to enter their name and address to provide proper routing for 9-1-1 service.

```
Line 1  →   *VOIP VPC CALL*
Line 2  →   631-203-4406   09:30:34 1-24-17
Line 3  →   sip:+16312034406@vzims.com
Line 4  →   000018       COOPER AVE
Line 5  →
Line 6  →
Line 7  →   CLINTON TWP                  NJ
Line 8  →   +040.642194 -074.880087
Line 9  →   UNC:              %         VOIP
Line 10 →
Line 11 →   ESRD  908-211-0064      ESN 3539
Line 12 →   HUNTERDON CO COMM
Line 13 →   CLINTON TWP PD    908   806-7579
Line 14 →   ANNANDALE FD      908   806-7969
Line 15 →   CLINTON EMS       908   806-7769
Line 16 →                          LEC  VZWWF
```

Figure 29 Sample ALI Screen for wireless over Wi-Fi

Note the customer line (3). Instead of the customer or provider name it displays a "Uniform Resource Locator" (.url) indicating a web address. The customer's phone number is incorporated in the web address for routing purposes. It is unknown if this will be the standard information provided by the carrier or if the customer name will be offered.

Text to 9-1-1

In February 2015 OETS was charged with developing a plan to implement Text to 9-1-1 statewide. A working group was formed. Recommendations from NENA, APCO, and the FCC were studied. Reports form PSAPs in other states who are providing Text to 9-1-1 service were reviewed.

Texting to 9-1-1 was intended to be offered in the "next generation 9-1-1". This would include video, audio and MMS messaging. As this is not in the near future it was decided to go for an "interim" solution that would provide SMS texting now without additional equipment or cost to the PSAPs.

SMS does not allow sending pictures, video, recorded messages or special characters. These are considered MMS messages and cannot be used to text 9-1-1 at this time.

The PSAPs were chosen, one for each county initially. Each PSAP had to choose the method that would be used to receive text messages. OETS contacted the FCC to indicate that New Jersey was ready to begin receiving text messages. The wireless carriers were notified. The Text Control Center was chosen. OETS worked with the PSAPs to prepare the necessary paperwork and agreements between all parties concerned.

Implementation of Text to 9-1-1 Service in New Jersey

The first phase is an interim solution. It is meant to provide some level of service prior to the implementation of the "Next Generation 9-1-1" service. Because of this we are starting with only 1 PSAP in each county. The PSAP will be able to provide EMD service. Text messages will not be transferred to another PSAP. The receiving PSAP will interrogate the sender and if the incident is not within their jurisdiction, relay the information to the proper PSAP/PSDP.

In the First Phase only SMS texts can be used. If the sender tries to send a message that is too long or is sent to more than one recipient, they will receive a "bounce-back" message" from the carrier that this service is not available. More advanced services such as MMS and video will be provided in the "next Generation deployment.
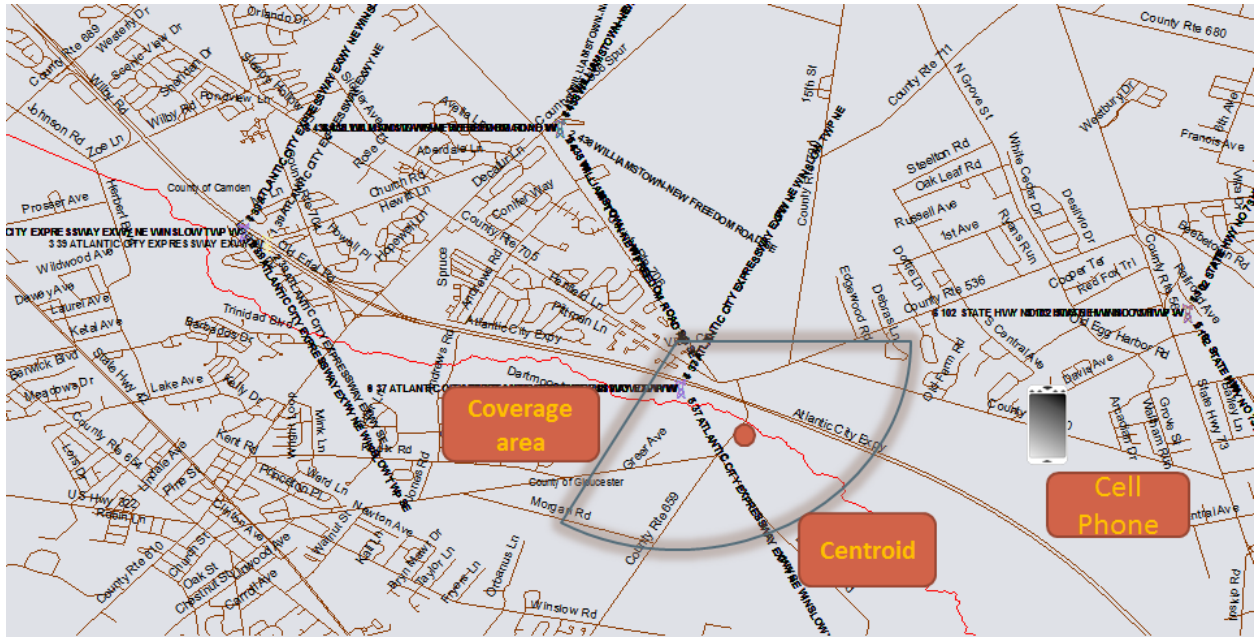
Figure 30: sample map for routing Text to 9-1-1

Routing Text to 9-1-1

Routing the text messages is similar to routing cell phone calls. Depending on the carrier, the text message will be routed based on the centroid of the cell towers coverage area or it may be routed based on the approximate location of the device being used. In each case the location used will be plotted on a map of the state. The shapefiles of each of the 21 counties has been provided and the text will be routed to the PSAP providing service for that county in which the location is mapped.

On the map we see several cell towers. The arc represents the coverage area of one of the antenna on the tower. The dot is the "centroid" that will be used to determine the location of the sender. The cell phone is the sender's actual location. For some carriers this will be the location used for routing.

Types of Service

Text messages can be delivered to the PSAP using the existing 9-1-1 phone circuits or over the internet. Both have been chosen for use in this project.

PSAPs that use the existing 9-1-1 circuits will receive text messages using the same equipment that they currently use for TDD/TTY. When a text is sent to 9-1-1 the Text Control Center will convert the message to baudot code and place a call to the PSAP.

The internet version will deliver the text message to the PSAP on a computer that has logged on to the provider's website. The service does not use the 9-1-1 network nor can it be interfaced with the PSAPs CAD system.

PSAPs Using TDD/TTY

The TTY/TTD service will ring at the PSAP the same way any other 9-1-1 call does. When the PSAP answers the call they will be presented with the traditional "tones" of a TTY/TTD call. The PSAP telephone equipment will; automatically enable the TTY/TTD function (if this is set by the PSAP) and the conversation will be

Figure 31: sample Text to 9-1-1 using TDD/TTY over existing 9-1-1 lines

conducted in the same fashion as a TTY/TTD call. The ALI screen will look like a standard wireless ALI screen. It may be Phase I or Phase II. Rebidding is possible to improve location accuracy.

Text to 9-1-1 messages will utilize the existing ALI screen format with some modification. The CALLER and ADDRESS fields will not display the usual information. Some carriers will indicate that this is a text message in the field instead.

```
*WRLS PH2*
609-610-0676 10:14:06  03-22-16
Text to TTY call
Text 2 TTY



+040.016198  -074.817002
UNC: 0001709  000%         WPH2
ESRD # 609-511-0788     ESN 5444
BURLINGTON CO COMM
F1=NJSP BRDTN 609         298-1170
F2=PENNSYLVANIA SP 215   493-4011
F3=PHILADELPHIA PD 215   521-2724
             LEC ATTMO
```

```
*WRLS PH2*
609-610-0676 10:14:06  03-22-16




+040.016198  -074.817002
UNC: 0005384  075%         WPH2
ESRD # 609-511-0788     ESN 5444
BURLINGTON CO COMM
F1=NJSP BRDTN 609         298-1170
F2=PENNSYLVANIA SP 215   493-4011
F3=PHILADELPHIA PD 215   521-2724
             LEC VZW
```

Figure 32: sample ALI screens of Text to 9-1-1 using TDD/TTY on existing 9-1-1 lines

```
ANI         96095114952
CPN         96092838916

Call 9551435    Arrives On           911-11        May/24/16 12:56:20 ED
911-11          Goes Off Hook                       May/24/16 12:56:20 ED
Call 9551435    Cellular Call                       May/24/16 12:56:23 ED
Call 9551435    CPN: 96092838916                    May/24/16 12:56:23 ED
Call 9551435    Is Assigned To       CT 1           May/24/16 12:56:24 ED
CT 1            Answers                              May/24/16 12:56:27 ED
Call 9551435    Is a TTY Call                       May/24/16 12:56:31 ED
CT 1            Hangs Up             Call 9551435    May/24/16 13:00:26 ED
911-11          Is Released                          May/24/16 13:00:26 ED
CT 1            Releases             Call 9551435    May/24/16 13:00:26 ED
Call 9551435    Finishes                             May/24/16 13:00:26 ED

ALI Information

□□ *WRLS PH 2*                   □
609-283-8916  12:56:23 05/24/16
Text to TTY call


Text 2 TTY

+039.984934 -074.548910
UNC: 0003339 000%        WPH2

ESRD # 609-511-4952   ESN 5444
BURLINGTON CO COMM
F1=NJSP BRDTN 609   298-1170
F2=PENNSYLVANIA SP 215 493-4011
F3=PHILADELPHIA PD 215 521-2724
             LEC SPPCS

TTY Conversation

C12:56:31 CALLER        > SMS CALL, PLEASE REPLY GA
C12:56:36 CALLER        > WBCS KYQDYUYK
C12:56:39 CALLER        > NLGPWY
O12:56:41 CT 1          > 911 where is your emergency q ga
C12:56:41 CALLER        > A?TSMS CALL; MY LOCATION148, RAYMOND ST, BROWNS
MILLS
, NULL(ACCURATE TO 69YARDS)HTTP //MAPS.GOOGLE.COM/MAPS?F=Q(AMP)
GEOCODE=(AMP)Q=39
.9766625,-74.5708637 GA
C12:57:26 CALLER        > SYSTEM  APPROXIMATE CELL SECTOR LOCATION PROVIDED
BY
SPRINT PCS LATITUDE, LONGITUDE = 39.984940, -74.548920 GA
C12:57:47 CALLER        > QH
C12:57:48 CALLER        > REFKQFTWMVTXCRKGQC.=2'(( /+2;=
C12:57:58 CALLER        > 07.BVECICY;603"!EJLV(,;61"761+,(FMWNIJJS
O12:58:19 CT 1          > do you
C12:58:23 CALLER        > IIROJGV
O12:58:25 CT 1          > ha
C12:58:27 CALLER        > C
O12:58:27 CT 1          > v
```

Figure 33: sample log of Text to 9-1-1 using TDD/TTY on existing 9-1-1 lines

The message will be received at the PSAP as a TDD/TTY call. The carrier will send a message to activate the TDD/TTY in the phone equipment. Once the PSAP responds the text message will be delivered. Additional information such as an approximate location, name of the person stored in the device and type of emergency may be included. This will vary by carrier and device. The latitude and longitude offered in the text message may differ from the latitude and longitude on the ALI screen.
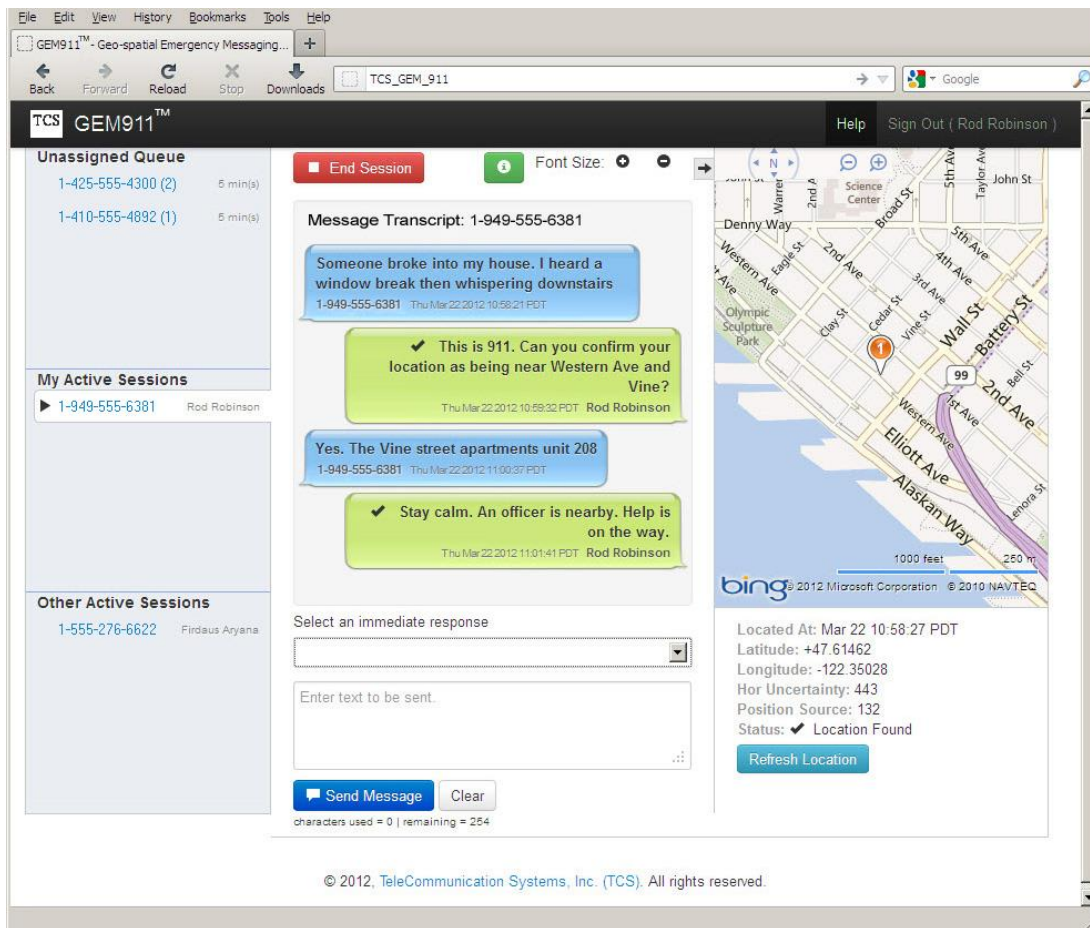
Figure 34: sample Text to 9-1-1 using internet based GEM 911

PSAPs Using GEM911

The GEM911 service is not on the 9-1-1 network. . It is available through the internet from the COMTECH TCS web server. It may be placed on a separate workstation or in one of the existing computer workstations at the PSAP. While responding to a text message the calltaker will still be able to receive 9-1-1 calls.

When a text message is received it will appear in the "Unassigned Queue" portion of the screen. When the calltaker selects it the message will appear in the center of the screen. The phone number of the sender will move to the "My Active Sessions" window. Text messages being answered by other calltakers will appear in the "Other Active Sessions" window.

In the center of the screen the calltaker can see the messages sent to the PSAP and the message the calltaker sends. Using the drop down window allows the calltaker to select any of the pre-loaded messages the PSAP has created. Or the calltaker can type their own messages in the box labeled "Enter text to be sent".

The map on the right will display the estimated location of the sender. Pressing the button marked "Refresh Location" allows the calltaker to update the sender's location. If they are in motion the screen will display the new location along with any previous ones.

Next Generation 9-1-1

Although 9-1-1 service has evolved greatly over the years, many forms of communication in use today cannot be accommodated by the current 9-1-1 systems. For this reason much work is being done to prepare for an IP based 9-1-1 network. Such a network would allow persons to contact PSAPs through text messages, instant messaging and would permit pictures or other media to be delivered to the 9-1-1 centers. Organizations such as the National Emergency Number Association (NENA) and the Association of Public-Safety Communications Officials (APCO) continuously work to ensure that 9-1-1 systems keep pace with the communications technologies in use by the public.

Glossary of Basic Telecommunications Terms and Acronyms

ABANDONED CALL   A call placed to 9-1-1 in which the caller disconnects before the call can be answered by the PSAP.

ACD   **A**utomatic **C**all **D**istributor. Equipment that distributes incoming calls to the available PSAP or PSDP personnel in the order the calls are received or holds the call until a call taker becomes available. The calls are routed to the least busy call taker.

ALI   **A**utomatic **L**ocation **I**dentification. The automatic display at the PSAP or PSDP of the caller's telephone number, address for the telephone and supplementary information.

ALS   **A**dvanced **L**ife **S**upport. Service provided by special teams which may be composed of Paramedics, Nurses, Doctors, and EMTs. These teams respond to the most serious, life threatening medical emergencies and are able to administer medication, defibrillation, and airway management.

ALTERNATE ROUTING   The capability of automatically rerouting 9-1-1 calls to designated alternate locations if all 9-1-1 trunks are busy or out of service. This capability may be activated upon request when 9-1-1 equipment fails or the PSAP itself is disabled.

ANI   **A**utomatic **N**umber **I**dentification. The automatic display at the PSAP or PSDP of the caller's telephone number.

ANSWERING POSITION   An appropriately equipped location within a PSAP that is used to receive incoming 9-1-1 calls.

BASIC 9-1-1   An emergency telephone number system using the digits "9-1-1" for access and routing all such calls from a central office to a single 9-1-1 answering point. No ANI or ALI features.

BLIND TRANSFER	A procedure in which the call taker fails to advise the caller of the transfer and/or fails to remain on the line to ensure an appropriate transfer has been completed. This procedure is statutorily prohibited for 9-1-1 calls in a New Jersey PSAP.
BLS	**B**asic **L**ife **S**upport. Service provided by EMTs which includes such care as CPR, Extrication, and wound care. Cannot administer medications.
CAD	**C**omputer **A**ided **D**ispatch. A computer based system designed to increase the efficiency and accuracy of Public Safety call handling and dispatching. This aid may range from a simple display of pertinent information on a screen, up to the actual selection and notification of field units by the computer. 9-1-1 systems may be interfaced with CAD systems.
CAD INTERFACE	The means of automatically inserting the ALI data into a Computer Aided Dispatch (CAD) system, as opposed to manually entering the information.
CALL CONFERENCING	A procedure by which the caller is transferred from a PSAP to another PSAP, PSDP, or other location, and in which the call taker remains on the line to obtain or relay additional information.
CALLED PARTY HOLD	The capability to maintain control of an incoming 9-1-1 call by a PSAP Telecommunicator for tracing or confirmation of an emergency even if the caller hangs up.
CALL RELAY	Call handling procedure whereby pertinent information is copied by the PSAP call taker, who then forwards the information to the appropriate action agency.
CALL REFERRAL	Call handling procedure in which a call is disposed of by providing the caller the appropriate number to call other than 9-1-1.
CALL TRANSFER	A call handling procedure in which a caller is transferred from a PSAP to another PSAP, PSDP, or other location, and in which the call taker has no need for additional information and therefore disconnects once the transfer has been completed.

CLASS OF SERVICE	A service order code designation of the telephone service features to which business and residential customers subscribe (i.e., business, residential, coin, PBX). This information appears on line nine on the ALI screen information.
CLEC	**C**ertified **L**ocal **E**xchange **C**arrier. A telephone company providing local telephone service.
CO	**C**entral **O**ffice. Telephone company facility that houses the switching and trunking equipment serving telephones in a defined area. A central office may handle one or more telephone exchanges. Also referred to as an End Office.
CONFERENCING	Allowing multiple parties to talk to each other simultaneously on the same line.
CPE	**C**ustomer **P**remise **E**quipment. Equipment located at the customer's (PSAP or PSDP) location.
CROSS TANDEM TRANSFER	The capability of transferring a call over the 9-1-1 network from a PSAP served by one tandem office to another PSAP served by a different tandem office.
CUSTOMER CARE CENTER	(CC) The Verizon Agency that serves as a central point for all PSAP trouble reports via the toll free number 800-773-7911. The CC is also responsible for continuously monitoring (and repair when needed) of the 9-1-1 Network tandem switches. (Formerly the 9-1-1 Control Center)
CUTOVER	The activation of a new telephone call processing or switching system.
DATA BASE	The pre-recorded information that describes a collection of items. In the 9-1-1 environment, these items are the telephone numbers, address information and routing information.
DEFAULT ROUTING	The capability to route a 9-1-1 call to a designated (default) PSAP when the incoming 9-1-1 cannot be selectively routed due to an ANI failure, garbled digits, or other cause.

DIAL TONE FIRST	The provision of dial tone to enable a caller to originate and complete 9-1-1 calls from public telephones without inserting a coin or any other device, such as a credit card. Also referred to as "coin free dialing".
DIRECT DISPATCH	An operational method in which the 9-1-1 call answering and Public Safety dispatching is done by the personnel at the PSAP.
DIVERSE ROUTING	The practice of routing calls through different circuit paths in order to prevent total loss of the 9-1-1 system in the event an individual circuit is disabled.
DMC	**D**atabase **M**anagement **C**enter. (Formerly known as ENAC, **E**mergency **N**umber **A**dministration **C**enter.) The Verizon agency which is responsible for maintaining the ALI database.
EMERGENCY CALL	A call routed to a PSAP or PSDP reporting an incident which is either in progress or had just occurred, and which requires an immediate response from one or more Public Safety entities.
EMS	**E**mergency **M**edical **S**ervices. Those personnel involved in any aspect of the provision of emergency medical care. This includes, but is not limited to, Emergency Medical Dispatchers (EMD), First Responders, Basic Life Support(BLS), Advanced Life Support (ALS), and Aeromedical Response teams
END OFFICE	See CO (Central Office)
ENHANCED 9-1-1	The emergency telephone number system using the digits 9-1-1 for access to a PSAP. Among the enhancements included are provision of ANI, ALI, and selective routing of calls to the appropriate PSAP. Also referred to as "E 9-1-1" or "9-1-1 E."
ESN	**E**mergency **S**ervice **N**umber. A four digit number assigned to an Emergency Service Zone (ESZ). The 9-1-1 computer associates the ESN with the address a call is received from and routes the call to the appropriate PSAP. This information appears on line 11 on the ALI display. For cellular calls this number indicates the specific cell site where the call was first received.

ESZ	**E**mergency **S**ervice **Z**one. A geographical area having a unique combination of police, fire and medical emergency response agencies. Also see ESN.
ETNS	**E**mergency **T**elephone **N**umber **S**ystem. Any system designed to give area citizens access to emergency response agencies via the telephone.
EXCHANGE	A defined telephone service area, identified by the three number prefix (the first three numbers of a telephone number following the area code). Also referred to as NXX.
FIXED TRANSFER	A feature that allows a PSAP to perform a single button transfer of an established 9-1-1 call to a predetermined location. These transfers do not change based on the ESN from which the call originated. The standard fixed transfers on the New Jersey 9-1-1 network include: Medevac, Poison Control, TTY, Redundant Call message, and Non-emergency Call message.
FORCED DISCONNECT	This feature allows the PSAP personnel to disconnect a 9-1-1 call to prevent jamming of incoming lines.
FX	**F**oreign E**x**change (line). The ANI telephone number is located in an area not within the boundaries of the local 9-1-1 service area, but it draws service from a CO within the 9-1-1 service area.
IDLE CIRCUIT TONE	An audible tone generated when the caller hangs up before the PSAP answers. This feature enables the PSAP personnel to distinguish between calls that have been abandoned before being answered and calls where the calling party is connected but unable to speak.
INTERCONNECT	The connection of the operating telephone company's equipment with the equipment of another vendor. Also a generic term used to refer to another vendor.
INTERLOCAL SERVICES AGREEMENT	An agreement among government jurisdictions or privately owned systems within a specified area to share 9-1-1 system costs, maintenance responsibilities, and other considerations.
LEC	**L**ocal **E**xchange **C**arrier. A telephone company that provides local telephone service.

LOGGING RECORDER	A device that electronically records all voice communications and transactions on the 9-1-1 lines at PSAPs and PSDPs. A logging recorder operates on a continuous or controlled basis, documents time and date information for the transactions recorded and is primarily for archival purposes.
MANUAL TRANSFER	A feature that allows a PSAP to transfer an established 9-1-1 call by manually dialing a 3-digit speed dial function, or a 7-digit or a 1+10-digit public network number.
MSAG	**M**aster **S**treet **A**ddress **G**uide. The MSAG contains all valid streets in the enhanced 9-1-1 service area. It includes low/high house numbers (address ranges), community name and ESN assignments.
NXX	The first three digits of a local telephone number that uniquely identifies the central office switching location within its area code. Also referred to as "NNX."
ONE BUTTON TRANSFER	The ability to conference another public safety agency onto a 9-1-1 call by pressing one button. Designed for Enhanced 9-1-1 systems, it requires Automatic Number Identification service.
P.01 GRADE OF SERVICE	A grade of emergency telephone service in which no more than one call in 100 attempts will be blocked during the average busiest hour.
PANI	**P**seudo **A**utomatic **N**umber **I**dentification. These numbers have several applications. They are assigned to a cell site sector to be used for routing a cellular 9-1-1 call to a PSAP. They are also used for 9-1-1 network access from outside the State of New Jersey by out-of-state telephone operators, remote motorist aid centers.
PBX	**P**rivate **B**ranch E**xc**hange. (Also known as Private Switch, PS) A private telephone system with a switch and many stations that are not individually identifiable to the telephone company's switching network and as a result, the individual station number and location information will not be displayed by the PSAP ANI or ALI equipment.

PILOT NUMBER	A telephone customer's main account number, lead number, listed number, or billing number.
PRIVATE SAFETY AGENCY	Any entity, except a municipality or Public Safety agency, that provides emergency medical, firefighting, or other emergency services.
PS	**P**rivate **S**witch. See PBX
PSAP	**P**ublic **S**afety **A**nswering **P**oint. A facility equipped and staffed to receive 9-1-1 calls.
PSAP PERSONNEL	Persons responsible for answering incoming 9-1-1 calls at a PSAP, determining the action to be taken, and executing the PSAP's procedures in the disposition of such calls. Also referred to as Call-takers, Communications Officers (or Operators), Dispatchers, Public Safety Telecommunicators, or PSAP Attendants.
PSDP	**P**ublic **S**afety **D**ispatch **P**oint. A location that provides dispatch services for one or more public safety agencies.
PST	**P**ublic **S**afety **T**elecommunicator. A person who works as a call taker or dispatcher in an emergency communications PSAP or PSDP.
PSTN	**P**ublic **S**witched **T**elephone **N**etwork. The totality of equipment, lines and controls assembled to establish communication paths between calling and called parties.
PUBLIC SAFETY AGENCY	A functional division of a public agency that provides fire fighting, police, EMS, emergency management or other emergency service.
REDUNDANT CALL	A call from a person reporting an incident which has already been received and who has no additional information to provide.
SELECTIVE TRANSFER	A feature that allows an established 9-1-1 call to be selectively transferred by the 9-1-1 tandem office from the PSAP to the correct PSDP associated with the caller's associated ANI without the PSAP personnel having to determine and manually dial the digits for the correct destination. The 9-1-1 tandem office uses the ANI/ESN data from the initial routing

	of the call to reroute the call to the correct secondary agency.
SINGLE-STAGE	A dispatch system where the call-taker and dispatcher responsibilities are handled by a single telecommunicator. Also referred to as "one-stage dispatch system" or "direct dispatch system."
SMS TEXT MESSAGE	SMS (short message service) is a basic form of texting. It is limited to 160 characters.
SPEED CALL NUMBER	A two-digit number prefixed with an asterisk (*), used to transfer a call to a location not on a preset routing button. Also called "Speed dial number."
SWITCH PROTECTION	A feature that makes it possible to reactivate 9-1-1 service despite a catastrophic failure of a single 9-1-1 tandem.
THOUSANDS NUMBER GROUP	The last four digits of a telephone number. Also known as "line number".
TRANSFER LOCATION	The location to which a 9-1-1 caller is transferred when the service needed is not supplied at the PSAP.
TTY	**T**ele**ty**pewriter. A telecommunications device for the hearing and/or speech impaired. Formerly referred to as TDD.
TWO-STAGE DISPATCH SYSTEM	A dispatch system in which the call-taker and dispatcher functions are separated and are handled by several telecommunicators.
UPS	**U**ninterruptible **P**ower **S**upply. Equipment with the capability of providing a continuous source of power without regard to interruption or loss of commercial power.
VoIP	**V**oice **o**ver **I**nternet **P**rotocol. A technology that enables voice messages to be sent through the Internet. Also may be referred to as: IP telephony, Internet telephony, Voice over Broadband (VoBB), broadband telephony or broadband phone.

ALI Screen Warning Messages

Wire Line ALI Screen Warning Messages

OUTGOING LINE ONLY
This message cautions the call taker that the call is being received from an out-going only line. The call taker is alerted to the fact that the calling party cannot be reached by dialing the number indicated in the ANI field. If appropriate the call taker should obtain the call bake number from the caller or utilize the pilot number listed on line 11 of the ALI screen.

OFF PREMISE EXTENSION
This message alerts the call taker that the calling party is using a telephone that has off premise extension service. This is a service in which the telephone recieves dialtone from a Private Branch Exchange (PBX) or Private Switch (PS) at a remote location. The call taker is made aware that erroneous ALI information may be displayed. The address information displayed may indicate the location from which the dial tone is being delivered and not the physical location of the telephone set. The caller may even be in a neighboring municipality, county or state. When this message is received, it is essential that the calling party's location and the location of the event be verified. Additionally, if the caller is in a different jurisdiction than the location displayed, the call-taker must ensure that appropriate transfers take place. The fixed transfer keys for the displayed agency may not be the correct response agencies because the call crossed jurisdictional boundaries.

* PAY PHONE*
This message cautions the call-taker that the caller is using a coin-operated telephone. Coin operated telephones may also display caution messages "* COIN PHONE*" or "*OUTGOING LINE ONLY*". This message alerts the call-taker that the original calling-party may not answer if there is a necessity to call them back. On some pay phones incoming calls are blocked preventing the call-taker from reinitiating the call if the calling party disconnects. When this message is received, there is a possibility that the event is not at the location displayed. The calling party may have traveled some distance before finding a telephone. Despite the fact that many false alarms may be received from public pay phones, the call-taker must process each call according to the PSAP agency's operating procedure. Additionally, it may be necessary to help the caller identify the actual location of the event if the person is unfamiliar with the area.

* COMMUNITY CENTREX*
This message cautions the call-taker that the caller has a residential type Centrex of service. This message alerts the call-taker that the ALI displayed may not indicate specific location information such as building or apartment numbers due to the manner of installation. When this message is received, it is essential that the call-taker question the caller for full location details required for a timely response.

* PBX CALL*
This message cautions the call-taker that the caller is using a Private Branch Exchange (PBX) telephone switch service. This message alerts the call-taker that the ALI displayed may reflect only the location of the calling party's main telephone equipment but not the specific location of the telephone unit being used. Additionally the pilot number displayed is not necessarily the number where the person may be directly reached and the ANI information indicates only the outgoing trunk used and not the callback number. When this message is received, the call-taker must not only

verify the actual location information but also the telephone number to be used should it be necessary to call the person back.

* FOREIGN EXCHANGE*
This message cautions the call-taker that the caller is using a foreign exchange (FX) service. FX service is when a customer is served by one central office, but receives dial tone from another central office. Intrastate FX 9-1-1 calls will be routed to the correct PSAP. Interstate FX service involves a customer who is physically in another state but receives dial tone from a New Jersey central office. Caution must be used when handling FX calls since they may have originated anywhere in the world. This message alerts the call-taker that the telephone number displayed may be unusual to the PSAP coverage area. When this message is received, the call-taker should be aware that an assumption should not be made that the caller's ANI is incorrect because the area code or exchange is "foreign" to the PSAP.

* POSSIBLE TTY CALLER *
This message cautions the call-taker that the caller may be using a text telephone device. This message alerts the call-taker that the call may need to be connected to the PSAP's TTY. When this message is received and the line is silent or the call-taker hears electronic tones, it may indicate the calling-party is communicating using a text telephone device. This message will only be displayed if the TTY user has registered with their telephone company as having this type of service. Not all users register, therefore, absence of this message is not a guarantee the call is not from a text telephone user. Additionally, other persons who are not text telephone users may use the same telephone unit so it cannot be assumed that because the message is displayed the calling-party is hearing or speech impaired.

* 3RD PARTY CONFERENCE*
This message cautions the call-taker that a caller is being transferred from an agency located outside of New Jersey. This may be a conference call involving an operator at a location where emergency signals are received, or it might involve a nurse at a telephone medical triage station, finally, the call could be from an out-of-state telephone operator. Information on the ALI screen will not reflect the caller's location rather it will show the pseudo ANI used to access the PSAP from outside the physical jurisdictional boundaries for that PSAP. All pseudo ANI numbers have been assigned a 908 area code and the exchange number 250; the line number (the last four digits of the telephone number) is unique for each municipality.

* MOVE IN PROGRESS*
This message is placed on a customer record when the customer requests duplicate service while moving from one residence or business to another. The information on the ALI screen will list the new address even if the call is made from the original location.

Wireless ALI Screen Warning Messages

WRLS PH2 NO POSITION SOURCE

The position source is an internal network indicator that specifies the type of positioning system used to determine the call location. When this caution message is received, the latitude and longitude displayed are for the caller's location but the system is unable to assign uncertainty or confidence values to the location data. On line 9, the class of service will display WPH2

WRLS PH2 NO MPC RESPONSE

If a failure occurs in the Mobile Positioning Center (MPC), the latitude and longitude will be for the cell tower, not the caller's location. The uncertainty and confidence fields will remain blank and the class of service will be WPH 1.

WRLS PH2 MPC LINK DOWN

No coordinates will be available for the caller's location, the latitude and longitude listed will be for the cell site. The uncertainty and confidence fields will remain blank and the class of service will be WPH 1.

WRLS PH2 LAT/LONG NOT AVAIL

If a failure or delay occurs in the information flow from the positioning equipment to the MPC, the call will arrive with Phase 1 information – the coordinates are for the cell site, not the caller. The uncertainty and confidence fields will remain blank and the class of service will be WPH 1. This is the most commonly seen caution message because the voice segment of the call processing is often delivered to the PSAP more quickly than the data elements.

VoIP ALI Screen Warning Messages

VOIP VPC TIMEOUT-REBID

If a failure occurs in the VOIP Positioning Center (VPC), and no location information is returned within a set amount of time after the PSAP answers the call the ALI screen will display this error mesage. Initiate a "rebid" to query the VPC for the correct information.

VOIP VPC LINK DOWN

If the network is unable to send the request for ALI information to the VPC due to the connect being lost it will return only the ESQK and the message "RECORD NOT FOUND".

VOIP VPC ERROR-REBID

If a failure occurs in the VOIP Positioning Center (VPC), other than "TIMEOUT" or "LINK DOWN", no location address is returned when the PSAP answers the call. Initiate a "rebid" to query the VPC for the correct information.

VOIP NO VPC

Received from a "static" VoIP provider when there is no connection to a VPC.

Attachment 1

New Jersey PSAP Inquiry Form and Instructions
New Jersey 9-1-1 PSAP Inquiry Form
Instructions for completing New Jersey 9-1-1 PSAP Inquiry Forms:

Top Portion of form: PSAP and Call Information:

Call Date: Enter the date the call occurred
Call Time: Enter the time the call occurred
LEC ID: Enter the appropriate local exchange carrier ID
Test / Actual Call: Check whether the call was a test call or an actual 9-1-1 call
*PSAP Name: Enter the name of the PSAP agency
*PSAP #:   Enter the three digit PSAP number
*County: Enter the appropriate county name
*PSAP Tel #:   Enter the PSAP's call back telephone number
*PSAP Fax #:   Enter the PSAP's fax number
PSAP Tkt.#:   Enter the PSAP tracking number for the call in question
Operator #:   Enter the operator number for the person processing the form
Reported Telephone #:   Enter the telephone number of the customer
CF #:   Enter the call forwarding number (if applicable)

* These items should be pre-filled on the master copy, then reproduce master as needed.

Section 1: Enter data as exactly as it is displayed on the ALI monitor. If a print screen copy is available, attach it to the form over section 1 prior to faxing to the LEC.

Section 2: Enter only data to be corrected. For Example, if the street number appears in Section 1 as "0" Main St. and the customer reports the correct street number is "100" only the Street # field should be completed.

Please note, for the Street # and Street Name fields box numbers or cross streets are not acceptable.

Telco Action: The customer's telephone company will use this section to document resolution of the discrepancy.

Findings Per: To note source of information for resolution, tax office, customer, or other.
Order #:   Enter order number for resolution actions
Database updated: Enter an "X" if database records were updated
No trouble found: Enter an "X" when database records <u>were not</u> updated.
Enter corrected data: Enter correct data as per investigation findings.
ESN #:   Enter correct ESN when the ESN is affected.
Remarks: For telephone company to enter remarks, messages, or processing notes
Tele Co Tracking #:   For telephone company to enter a tracking number for the discrepancy
Closed Date: Enter the date the discrepancy was resolved.
Initials: Enter initials or ID of person providing the information

Signature Authorizing ESN / Agency Change: The entry of a signature authorizes the update of the ESN / Agency data for streets that contain <u>assigned</u> street numbers. NOTE: a default ESN will be applied for <u>unnumbered</u> streets. For a change from a default ESN to an assigned ESN, due to new street name or street number range assignment, this form should be forwarded to the affected municipality's 9-1-1 coordinator for a map and MSAG update.

<u>PSAP Inquiry Form Processing</u>

When database errors are encountered, the PSAP is responsible for completing a PSAP inquiry form and forwarding it to the correct local exchange carrier (LEC). Additional carriers are in the process of establishing 9-1-1 interconnections. Check the OETS website for updated information on LECs providing service in New Jersey. (www.nj.gov/911)

Call Date:		Call Time:		LEC ID:		Test Call Actual Call	
PSAP Name:				PSAP #:		County:	
PSAP Tel.#		PSAP Fax#		PSAP Tkt#		Operator #	
Reported Telephone #				CF#	[ ]		

SECTION 1: Enter data exactly as displayed on ALI Monitor or attach print screen copy

Caution Msg:				Name:			
Street #		Street Name:					
Locality			Unit#	Flr#		Class Service:	
Municipality			Bldg ID				
Pilot #			ESN #		|	|	|
PSAP ID			Tel # [ ]				
Police			Tel # [ ]				
Fire			Tel # [ ]				
EMS			Tel # [ ]				

SECTION 2: Enter only data that is to be corrected, *leave unaffected fields blank*

Caution Msg:				Name:			
Street #		Street Name:					
Locality			Unit#	Flr#		Class Service:	
Municipality			Bldg ID				
Pilot #			ESN #		|	|	|
PSAP ID			Tel # [ ]				
Police			Tel # [ ]				
Fire			Tel # [ ]				
EMS			Tel # [ ]				

T	Findings tax ofc cust other	Order #		Database Updated No trouble found
E	**Enter Corrected Data**			
L				
C				
O				
	ESN #		Remarks	
A				
C				
T				
I				
O				
N	Telephone Co Tracking #:		Date Closed	Initials

Signature Authorizing ESN / Agency Change:

Attachment 2

SAMPLE ALI SCREENS

```
856-858-7626 11:43:12  02-08-06
FLANAGAN ROBERT
000210      CRYSTAL LAKE
        AVE  W

HADDON TWP              NJ
APT       262-A FLR     RESD

PILOT # 856-858-7626   ESN 1387

CAMDEN COUNTY COMM CENTER
HADDON TWP PD      856-783-4900
WESTMONT FD        856-783-4444
WESTMONT EMS       856-783-4444
                   LEC CAVLR
```

Figure 35: Sample wireline phone service

```
*CAUTION* PBX CALL
856-768-7626 19:10:12  02-08-06
CAMDEN COUNTY VO TECH SCHOOL
001400      BERLIN-CROSSKEYS
              ROAD

GLOUCESTER TWP            NJ
              FLR      BPBX

PILOT # 856-768-7600    ESN 0182

GLOUCESTER TWP POLICE
GLOUSTR TWP PD     856-227-1900
ERIAL FD           856-783-4444
ERIAL EMS          856-783-4444
                   LEC CNGLR
```

Figure 36: Sample from a PBX phone over wireline service. Displays only the main address of the customer not the actual location. Caller may be in another building in another location other than the one shown. Business VoIP service may work the same if not properly set UP.

```
*WRLS PH1*
609-789-2345 09:20:34  02-08-05
VERIZON WIRELESS
0000000088      DENNISVILLE
              RD      NE
RADIUS 05 MILES
MIDDLE TWP               XX
+039.073200  -074.492600
UNC:          %       WPH1

ESRD # 609-511-4000      ESN 5404
NJSP OUD-SOUTH COMM 4
F1=GS PKY BASS RVR 609  295-2031
F2=MIDDLE TWP PSAP 609  465-8700
F3=LOWER TWP PSAP 609   886-2711
                   LEC VRZWL
```

Figure 38: Wireless service showing Phase I information.

```
*WRLS PH2*
609-789-2345 09:21:14  02-08-05
VERIZON WIRELESS
0000000088      DENNISVILLE
              RD      NE
RADIUS 05 MILES
MIDDLE TWP               XX
+039.103440  -074.802620  +00000
UNC: 0000150  90%       WPH2

ESRD # 609-511-4000      ESN 5404
NJSP OUD-SOUTH COMM 4
F1=GS PKY BASS RVR 609  295-2031
F2=MIDDLE TWP PSAP 609  465-8700
F3=LOWER TWP PSAP 609   886-2711
                   LEC VRZWL
```

Figure 37: Wireless service showing Phase I information.

```
*WRLS PH2* LAT/LONG NOT AVAILABLE
609-783-4216 19:14:04  02-12-06
AT&T WIRELESS
0000000655      ABSECON
                        BLVD  SE
RADIUS 04 MILES
ATLANTIC CITY              XX
+039.371060  -074.430250
UNC:          %          WPH1

ESRD # 609-511-6545    ESN 5935
ATLANTIC CITY PD
F1=EGG HRBR CITY  609    235-1000
F2=PLEASANTVIL    609    933-0555
F3=AC EXPRESSWAY  609    969-3128
                      LEC ATT
```

Figure 40: Wireless service showing Phase I information.

```
*WRLS PH2 MPC LINK DOWN*
908-789-2345 03:12:55  05-14-07
VERIZON WIRELESS
0000000296      MIDLAND
                    AVE      NE
RADIUS 01 MILE
SADDLEBROOK TWP           XX
+040.887636  -074.101817
UNC:          %          WPH1

ESRD # 732-511-3282    ESN 5902
BRGN CO-SDL BRK 201
F1=SDLE BRK PD   201    235-1000
F2=NJSP PKWY     973    933-0555
F3=NJSP TOTOWA   973    969-3128
                      LEC VRZWL
```

Figure 39: Wireless service showing Phase I information.

```
*CAUTION* 3RD  PARTY CONFERENCE
908-250-4699 09:22:34  12-08-07
3RD  PARTY CONFERENCE
0000000    UNKNOWN ADDRESS


UPPER DEERFIELD            NJ


PILOT # 908-250-4699   ESN 1792

CUMBERLAND COUNTY COMM
NJSP BRIDGETON      856  235-1000
UD TWP FIRE  3      856  933-0555
UD TWP EMS          856  969-3128
                    LEC
```

Figure 42: Call being transferred into the New Jersey 9-1-1 network from outside of the state.

```
*VOIP VPC CALL*
866-866-5006 08:24:34  11-26-08
ONSTAR CALL CENTER
0000000


ELIZABETH                 NJ
+040.663633 -074.20611
UNC:0000100   95%        VOIP

ESRD # 732-211-3282    ESN 0115
ELIZABETH POLICE
ELIZABETH POLICE  908  558-2083
ELIZABETH FIRE    908  558-2083
ELIZABETH AMBLSVC 908  558-2083
                    LEC TCS
```

Figure 41: Call transferred into the New Jersey 9-1-1 network by OnStar using VoIP.

```
*VOIP VPC CALL*
856-342-3426 08:25:34  03-26-06
TAYLOR STEPHEN
0000000017 B      WILLOW
                    WK

CAMDEN CITY               NT
+039.910871  -075.110794
UNC:0000100   95%        VOIP

ESRD # 856-211-1000    ESN 1377
CAMDEN CITY PD
CAMDEN CITY PD 856      757-7400
CAMDEN CITY FD 856      757-7400
CAMDEN CITY EMS 856     783-4444
                    LEC INTRA
```

Figure 44: VoIP call to 9-1-1

```
*VOIP VPC TIMEOUT-REBID*
856-211-1000 08:25:10  03-26-08
VONTAGE
0000000001      VOIP
                    ST

CAMDEN CITY               NT
VOIP SHELL RECORD
UNC:          %          VOIP

ESRD # 856-211-1000    ESN 1377
CAMDEN CITY PD
CAMDEN CITY PD 856      757-7400
CAMDEN CITY FD 856      757-7400
CAMDEN CITY EMS 856     783-4444
                    LEC INTRA
```

Figure 43: VoIP call requiring "rebid" to obtain address and customer information.

```
*WRLS PH2 LAT/LONG NOT AVAIL*
609-801-2345 09:21:14  02-08-14
ANGELO A RANOLDI
000050        SHEFFIELD PL


SOUTHAMPTON TWP               NJ
+039.896894  -074.705958
UNC:          %         WPH1

ESRD # 609-511-1630     ESN 1117
BURLINGTON CO COMM
F1=NJSP BRDTN  609      298-1170
F2=PENNSYLVANIA SP 215  493-4011
F3=PHILADELPHIA PD 215  521-2724
                   LEC VZTHN
```

Figure 47: Wireless service using a Verizon network extender. A cell phone connects to a device in the residence and the 9-1-1 is sent over the internet to the PSAP.

```
*WRLS PH2*
609-437-9008 23:13:11  12-25-11
FIXED ATTMO 8006356840 OPT4
002367        LINDEN
              AVE

WATERFORD TWP                NJ
+039.771838  -074.851956
UNC:0000109     090%       WPH2

ESRD # 856-511-6723     ESN 5445
CAMDEN CO COMMUNICATIONS 856
F1=NJSP TURNPIK 609     298-1170
F2=PENNSYLVANIA SP 215  493-4011
F3=PHILADELPHIA PD 215  521-2724
                   LEC ATTMO
```

Figure 46: Wireless service using an AT&T Micro Cell. A cell phone connects to the device in the residence and the 9-1-1 is sent over the internet to the PSAP.

```
*WRLS PH2*
609-610-0676 10:30:46  03-22-16
Text to TTY call


Text 2 TTY

+040.032324  -074.857922
UNC: 0001709  000%        WPH2

ESRD # 609-511-0790     ESN 5444
BURLINGTON CO COMM
F1=NJSP BRDTN 609       298-1170
F2=PENNSYLVANIA SP 215  493-4011
F3=PHILADELPHIA PD 215  521-2724
                   LEC SPPCS
```

Figure 48: Text to 9-1-1 sent to a PSAP using TDD/TTY for receiving text messages.

```
*WRLS PH 2 LAT/LONG NOT AVAIL*
609-610-0676 10:30:46  03-22-16




+040.012851  -074.805436
UNC: 0000872  100%        WPH1

ESRD # 609-511-0790     ESN 5444
BURLINGTON CO COMM
F1=NJSP BRDTN 609       298-1170
F2=PENNSYLVANIA SP 215  493-4011
F3=PHILADELPHIA PD 215  521-2724
                   LEC TMOB
```

Figure 45: Text to 9-1-1 sent to a PSAP using TDD/TTY for receiving text messages.

```
*VOIP VPC CALL*
609-610-0676 10:28:34  04-26-16
MARS, CHARLES-MOBILE RAPIDSOS
0000001        ACADEMY   DR


RSOS CARCRASH ACC 20M
WESTHAMPTON TWP              NJ
+040.016338 -074.816186
UNC:          %         VOIP

ESRD # 609-211-4265    ESN 1112
BURLINGTON CO COMM
WESTHAMPTON TWP PD 609 267-8300
BURL CO FIRE DISP  609 267-8300
BURL CO EMS DISP 609   267-8300
                   LEC BAND
```

Figure 49: Wireless call to 9-1-1 made using "SOS 911 HAVEN" app.