



**PENNSYLVANIA EMERGENCY
MANAGEMENT AGENCY
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**Deployment Procedures and Standards for Phase I and Phase II
Wireless E9-1-1 Deployment for the Commonwealth of Pennsylvania
August 23, 2005**

Authority

State of Pennsylvania Act 78 of 1990, as amended by Act 17 of 1998, and Act 56 of 2003 (HB1018 of 2003) gives the Pennsylvania Emergency Management Agency (PEMA) the authority and responsibility to implement a statewide wireless E9-1-1 Plan and System, and provides PEMA with significant oversight of wireless E9-1-1 service in the Commonwealth. Section 11.2 of Act 78 (as amended by Act 56) requires and authorizes PEMA to oversee the development and implementation of a statewide wireless E9-1-1 Plan that provides for all aspects of the development, implementation, operation, and maintenance of an integrated statewide wireless E9-1-1 system.

The overall goal is to provide PEMA with the authority to oversee the implementation of an integrated statewide wireless E9-1-1 system and oversee the deployment of wireless E9-1-1 service, while maintaining local autonomy and control over the day-to-day operations of E9-1-1 service.

The following procedures have been established to assist the wireless carrier in fulfilling the minimum deployment standards that have been established.

The carrier is expected to follow all current or future rules and procedures adopted by PEMA during this deployment and for future service delivery.

Deployment Procedures

Schedule Coordination

All deployment activities including meetings, testing, and final deployment must be scheduled and coordinated in advance with the agency making the request for wireless service (PSAP) or their designated representative.

Kick-Off meeting

- The Kick-Off meeting should be the first step of the deployment project after the PSAP has decided it is prepared to request and accept wireless E9-1-1 service (per FCC definition of readiness), and has issued a Request for Service letter to the carrier.
- The PSAP has the option to proceed with wireless E9-1-1 implementation without requesting a kick-off meeting if the PSAP determines that the kick-off meeting with the carrier will not be useful to facilitate the implementation process.
- A toll free conference bridge will be provided by the carrier for the kick-off meeting.
- Participants in the meeting should include the PSAP Manager/9-1-1 Director and assigned staff, designated consultant (if any), Wireless Service Provider (WSP) and/or their Third Party Agent, 9-1-1 system Service Provider, CPE vendor, CAD vendor, mapping system vendor, and GIS staff.
- The meeting will serve to
 - Identify the stakeholders from all companies and agencies involved.
 - Identify a single point of contact (SPOC).
 - Identify who will be responsible for what tasks.
 - Establish type of delivery technology to be used (CAS, NCAS, HCAS).
 - Determine the air interface type being deployed (CDMA, TDMA, GSM).
 - Establish the carrier location technology to be used (Phase II only).
 - Identify the MSC default routing.
 - Review the PSAP request for MSC alternate routing.

- Establish rules and procedures concerning routing decisions, testing procedures (*see below*), and post deployment network changes and maintenance sites.

PSAP Certification of Readiness to deploy Wireless E9-1-1

- The PSAP, or their designated agent, will provide the carrier with Certification of Readiness to deploy Wireless E9-1-1 at the carrier's request. The required forms will be provided by the carrier or their agent.

Routing

The carrier will provide the data necessary for the PSAP to determine the correct routing of wireless 9-1-1 calls from sectors located within the PSAP's jurisdiction, based upon the operational requirements of the PSAP.

- A routing sheet will be provided to the PSAP by the carrier indicating the location of each sector within the PSAP jurisdiction. Sector information will be provided showing:
 - Cell Site-Sector ID
 - Air interface (CDMA, TDMA, GSM, AMPS, etc)
 - Location technology used – Phase II only
 - MSC switch(s) routing the 9-1-1 call
 - Tower coordinates
 - Sector azimuth (true)
 - Sector directional label
- A map will be provided to the PSAP by the carrier indicating the location of each tower within the PSAP jurisdiction, The maps will include:
 - A graphic display of the projected RF coverage area and azimuth for each sector.
 - Sites located in neighboring jurisdictions within 5 miles of the requesting jurisdiction's boundaries.

MSC 9-1-1 trunks (to the selective router or switch providing 9-1-1 service to the PSAP)

- Adequate trunking will be provisioned to ensure that the caller receives no more than one busy signal in 1,000 (P.001) between the MSC and Selective Router or PSAP 9-1-1 service provider during the average busy hour.
- MSC alternate routing destination, where available, will be provided as requested by the PSAP.
- MSC 9-1-1 trunk diversity and redundancy will be provided where supported by the PSAP's 9-1-1 service provider.

ALI Data

- **ALI Data Fields**
The carrier will provide individual fields in the routing sheet to be used by the PSAP to define the Phase I ALI data to be delivered to the PSAP for the 9-1-1 calls originating from each sector. Individual fields will be provided in accordance with NENA 02-010 ALI format standards. The ALI data will be delivered to the PSAP.
 - Carrier Name
 - Call Back Number (CPN) with prefix of "CALL BK"
 - Street Numeric (house number)
 - Street Name (can include street directional prefix, street name, street suffix, street qualifier)
 - Community name
 - Sector directional (building location field)
 - Cell-sector ID
- **COS:** Wireless ALI records will display the Class of Service (COS) for the 9-1-1 call based on the following criteria:
 - **WRLS:** Phase I location data is being provided from a Phase I deployed cell sector.
 - **WPH1:** Phase I location data is being provided from a Phase II deployed cell sector.
 - **WPH2:** Phase II location data is being provided from a Phase 2 deployed cell sector.
- **Phase II Location Data:** The following Phase II data fields will be populated:
 - Latitude (in decimal degrees)
 - Longitude (in decimal degrees)
 - Uncertainty (meters)

- Confidence (percent). Referenced to 95%
- Phase I location data provided in the Phase II environment will be the accurate coordinates of the tower.
- All the ALI data otherwise required for Phase I

Test Procedures

Profile Test:

A Profile test will be performed prior to the Phase-I deployment test. The purpose is to confirm that the network is fully operational and capable of delivering wireless ANI/ALI to the PSAP; to allow the PSAP to confirm that all equipment is operational; and to avoid the unnecessary scheduling of resources required for a deployment test.

- The profile test will be coordinated with, and proceed under the direction of the PSAP representative.
- The carrier will provide a toll free conference bridge for the use of all stakeholders.
- The carrier may opt to originate the test call from a “toy cell” as long as the test call provides the equivalent functionality of a live field test (field sector exempted).
- Test calls will be placed through the network to verify that calls can complete to the PSAP with ANI (ESRD/ESRK) and ALI (CPN, Tower address).
- Voice and routing will be tested for each individual trunk from the MSC to the switch providing 9-1-1 service to the PSAP.
- A successful profile test will be conducted prior to scheduling drive testing.

Drive Testing (Field Testing) Phase I

The carrier will test each sector assigned to be routed to the PSAP to confirm routing, verify ALI data, and test call performance.

- The drive test will be coordinated with, and proceed under the direction of the PSAP representative.
- A Test Validation Worksheet (TVW), as provided to the test driver, will be provided to the PSAP representative for review and use during drive testing.
- The carrier will provide a toll free conference bridge for the use of all stakeholders.
- The carrier will provide field tester(s) equipped to complete all components of the drive test and to perform testing of all sectors.
- Multiple technologies providing coverage in the PSAP’s jurisdiction will be deployed at the same time (GSM, TDMA, AMPS).
- System testing will be performed to verify performance for the following call types. The purpose of the system test is to assure that all calls handled by the carrier’s network are delivered to the appropriate PSAP in the appropriate manner. This test need only be performed for one sector. The following tests must be performed for each air interface.
 - A current subscriber handset will be tested to verify that voice and the correct ANI and ALI are delivered to the PSAP.
 - NSI (Non-Service Initialized) phone dialing 9-1-1. A phone with a MIN and handset ESN not identified by the system will be tested to confirm that “911-xxx-xxxx” is the CPN delivered to the PSAP. The “xxx-xxxx” will be the last 7 digits of the cell handset ESN.
 - A roamer handset will be tested to verify that voice and the correct ANI and ALI are delivered to the PSAP.
 - A Pre-paid account handset (if supported by the carrier’s network) will be tested to verify that voice and the correct ANI and ALI are delivered to the PSAP.
- MSC 9-1-1 trunk alternate routing (overflow) will be tested.
- Drive testing will be performed for each sector to verify that voice and the correct ANI and ALI are delivered to the PSAP for each air interface.
- The PSAP reserves the right to stop, pause, and/or reschedule partial or complete drive testing.
- Test Acceptance:
 - A final TVW (corrected) will be provided by the carrier to the PSAP.
 - The PSAP will review the test results and upon receipt of a corrected TVW, will either provide the carrier with an acceptance of Phase I deployment; or
 - Identify the conditions that need to be corrected prior to acceptance.

- The PSAP may opt to provide a conditional “go-live” acceptance to the carrier, predicated on the correction of identified deployment test failures.
- The carrier will be required to validate the corrected conditions by re-testing with the PSAP that meets the standards identified herein.
- Post-deployment information will be provided to the PSAP that will provide:
 - Detail trouble reporting contacts and procedures.
 - Rules for obtaining subscriber address information.
 - Subpoena information for law enforcement purposes.

Drive Testing (Field Testing) Phase II

- The drive test will be coordinated with, and proceed under the direction of, the PSAP representative.
- A Test Validation Worksheet (TVW) will be provided to the PSAP for review and use during testing.
- The carrier will provide a toll free conference bridge for the use of all stakeholders.
- The carrier will provide field tester(s) equipped to complete all components of the drive test and to perform testing of all sectors.
- Multiple technologies providing coverage in the PSAP’s jurisdiction will be deployed at the same time (GSM, TDMA, AMPS).
- System testing will be performed to verify performance for the following call types. The purpose of the system test is to assure that all calls handled by the carrier’s network are delivered to the appropriate PSAP in the appropriate manner. This test need only be performed for one sector. The following tests must be performed for each air interface.
 - A current subscriber handset will be tested to verify that voice and the correct ANI and ALI are delivered to the PSAP.
 - NSI (Non-Service Initialized) phone dialing 9-1-1. A phone with a MIN and handset ESN not identified by the system will be tested to confirm that “911-xxx-xxxx” is the CPN delivered to the PSAP. The “xxx-xxxx” will be the last 7 digits of the cell handset ESN.
 - A roamer handset will be tested to verify that voice and the correct ANI and ALI are delivered to the PSAP.
 - A Pre-paid account handset (if supported by the carrier’s network) will be tested to verify that voice and the correct ANI and ALI are delivered to the PSAP.
- MSC 9-1-1 trunk alternate routing (overflow) will be tested.
- Drive testing will be performed for each sector to verify that voice and the correct ANI and ALI are delivered to the PSAP for each air interface.
- The PSAP will rebid ALI to confirm the delivery of Phase II data.
 - The PSAP may utilize CPE automatic ALI Rebid.
 - The ability to acquire mid call location updates will be tested.
- Except where updated by the Phase II ALI data, the Phase I ALI data will continue to be displayed at the PSAP.
- The PSAP may opt to document the distance resulting from a comparison of the caller location as reported by the field tester, and the location as displayed on the PSAP mapping system. To facilitate the process, the field tester will provide, upon PSAP request, the location used to originate the 9-1-1 call using landmarks identifiable to the PSAP mapping system.
- The PSAP reserves the right to stop, pause, and/or reschedule partial or complete drive testing.
- Test Acceptance:
 - A final TVW (corrected) will be provided by the carrier to the PSAP.
 - The PSAP will review the test results and upon receipt of a corrected TVW, will either provide the carrier with an acceptance of Phase II deployment; or
 - Identify the conditions that need to be corrected prior to acceptance.
 - The PSAP may opt to provide a conditional “go-live” acceptance to the carrier, predicated on the correction of identified deployment test failures.
 - The carrier will be required to validate the corrected conditions by re-testing with the PSAP that meets the standards identified herein.
- Post-deployment information will be provided to the PSAP that will provide:
 - Detail trouble reporting contacts and procedures.
 - Rules for obtaining subscriber address information.
 - Subpoena information for law enforcement purposes.

Other Network Testing

The carrier will comply with PSAP requests for additional 9-1-1 network performance testing related to the processing of wireless 9-1-1 calls. The intent is to confirm the correct operation of the PSAP's protocol for out of network wireless 911 calls utilizing a brief test period during the deployment test. The PSAP's tests may include, but are not limited to:

- Wireless 9-1-1 transfer capability to another PSAP.
- The receipt of correct ALI data at the transfer destination PSAP.
- The receipt of correct Phase II ALI data upon ALI rebid at the transfer destination PSAP (assumes Phase II deployment at both PSAPs).

Post Deployment Procedures

Maintenance Sites

The PSAP must be contacted with sufficient notice to ensure that testing meeting the criteria identified in this document is completed for the following situations:

- Anytime a new tower is to be added to the network within the PSAP's jurisdiction.
- Anytime changes are planned to an existing site.
- Anytime a new delivery technology is changed (TDMA to GSM).
- Anytime the wireless delivery system is being serviced which results in outages, or interruptions, or anytime there is a failure of the service.
- Anytime an MSC switch is re-homed.
- Under no circumstances should wireless 9-1-1 be deployed without sufficient notice to, coordination with, testing by, and acceptance from the PSAP.

Carrier contact information update

The PSAP must be notified:

- Anytime the trouble reporting process is changed.
- Anytime the contacts at the carrier or 3rd Party Provider change.