



NG9-1-1 Plan overview

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Definition of Next Generation 9-1-1

According to the National Emergency Number Association (NENA), NG9-1-1 is:

“...an IP based replacement for E9-1-1 features and functions that supports all sources of emergency access to the appropriate PSAPs, operates on reliable, secure, managed multi-purpose IP networks, and provides expanded multimedia data capabilities for PSAPs and other emergency responders....”

Plan Objectives

- Establish a strategy implementing NG9-1-1 throughout the Commonwealth of Pennsylvania in a consistent, precise manner while maximizing all available resources
 - Utilize standards based technology
 - Implement IP capable PSAP
 - Geographic based routing and Database integration
 - Deploy NG9-1-1 capable applications
 - Converge networks and systems

Foundational Requirements

- The Pennsylvania NG9-1-1 strategy meets the NENA guidelines of “Any device, Anytime, Anywhere”
- Consumer access to emergency services via any reasonable device
- Reliability of the systems designed into the entire solution
- The network must:
 - be robust and designed with sufficient diversity and redundancy
 - support all new and evolving applicable technical and operating standards as they are developed
 - follow set standards and specifications
 - designed with sufficient capacity to support public safety needs
- Implementation of NG9-1-1 supports migration to consolidation of equipment, and sharing of resources
- The network facilitates the pooling of operational and capital resources
- 9-1-1 “calls” will continue to be received locally

Assumptions

- Without change, there is not enough funding to build out NG9-1-1 in any fashion
- PEMA authorizes which entities or organizations access the network
- PEMA provides approval for applications and services
- PSAPs retain control for managing daily operations
- Regional governing entities retain administration of respective emergency response functions
- Regional governance authorizes how the network is accessed
- Network designed to support a phased implementation
- Network permits connection to the existing E9-1-1
- IP connectivity to the legacy telecommunications system

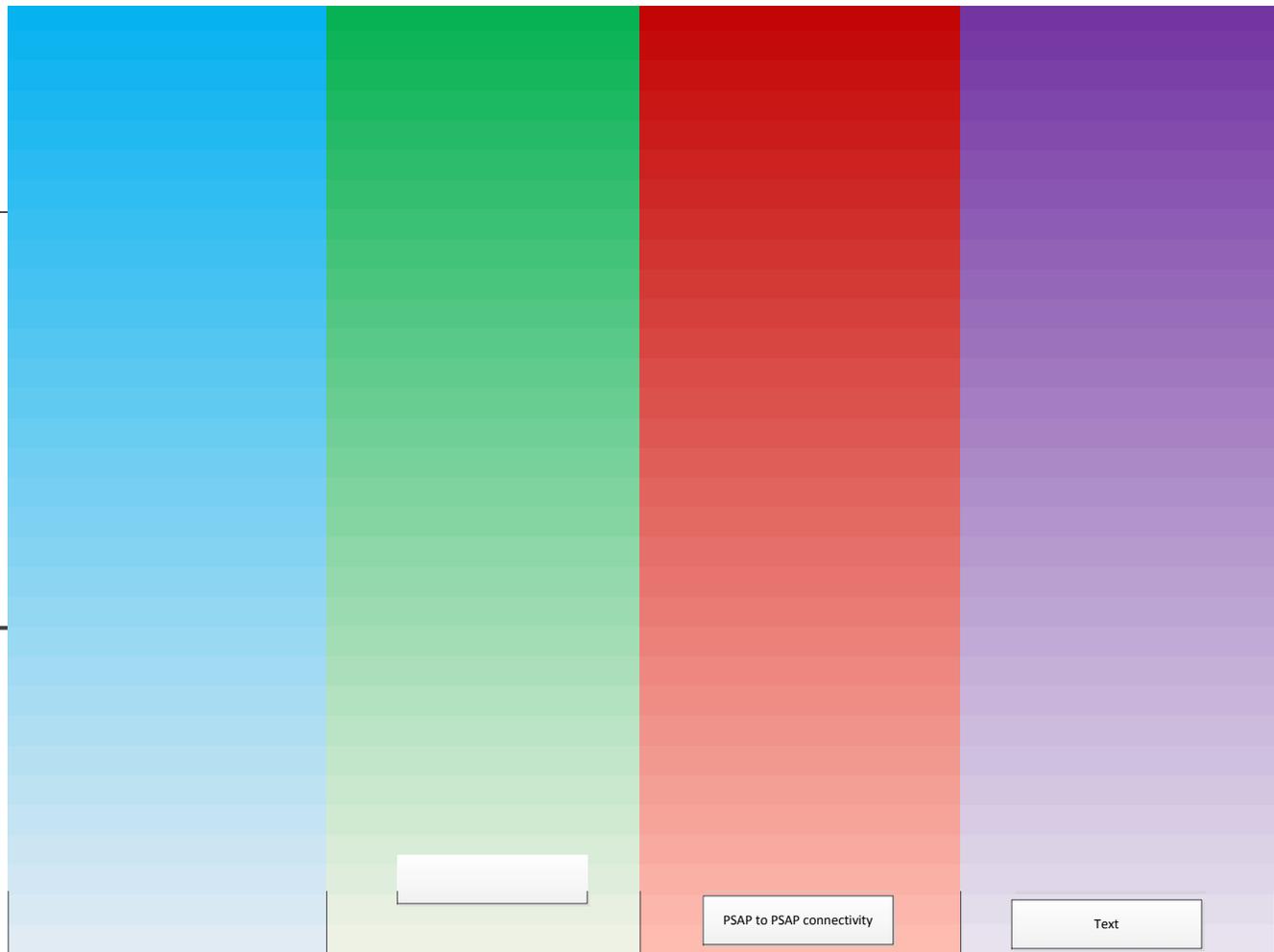
Assumptions (cont.)

- Each provider maintains responsibility for the connection costs of and meeting the ESInet gateway requirements
- All data and voice communication from the ESInet to the PSAP will migrate to IP
- PSAPs meet state or accepted industry requirements for access, security, level of service and Customer Premises Equipment (CPE)
- The network architecture is expected to maximize cost efficiency and increase sharing of resources
- Collaborative procurement and purchasing decisions

Current limitations

- Current networks built for wire line 9-1-1
- Limited to Local Area Transport Areas (LATA) as defined by the regulated telephone companies
- Multiple connections required to increase bandwidth and capability
- Lack of sustainable funding
- Siloed systems-
 - Duplication without redundancy
 - Excessive capacity
 - Higher costs for replacement, support and sustainability
 - Multiple maintenance and management arrangements
 - Lack of interoperability

Migration to NG9-1-1



Operations

- PEMA provides the umbrella of functional and operational guidelines allowing for uniform deployment of ESInets throughout the state
- Implementation of a Commonwealth-wide ESInet includes networks from multiple providers:
 - Private sector
 - State
 - County
 - BBMM
- The primary goal of the ESInet is increasing PSAP Interoperability
- The Statewide IP network provides standardized, secure, managed infrastructure interconnecting multiple PSAPs without limiting any aspect of communication

Implementation

- Deployment of ESInet's across the state on a regional basis
- ESInets interconnected through standards based foundation
- Regionalized communication platform to share services and avoid cost duplication
- Increase efficiencies through utilization of the Regional Advisory Group
- Establish a Public Safety Communications network to support greater needs

Regionalization

- Regional networks are preferred when assembling the components of an ESInet
- Regional ESInet configurations maximize shared costs and cost avoidance for systems and operations
- PEMA recommends a uniform deployment of NG9-1-1 within an ESInet
- ESInets are configured between and among a variety of agencies
- Regional networks facilitate operational and capital resource pooling
- Regionalization supports a “best practices” approach to large scale deployment

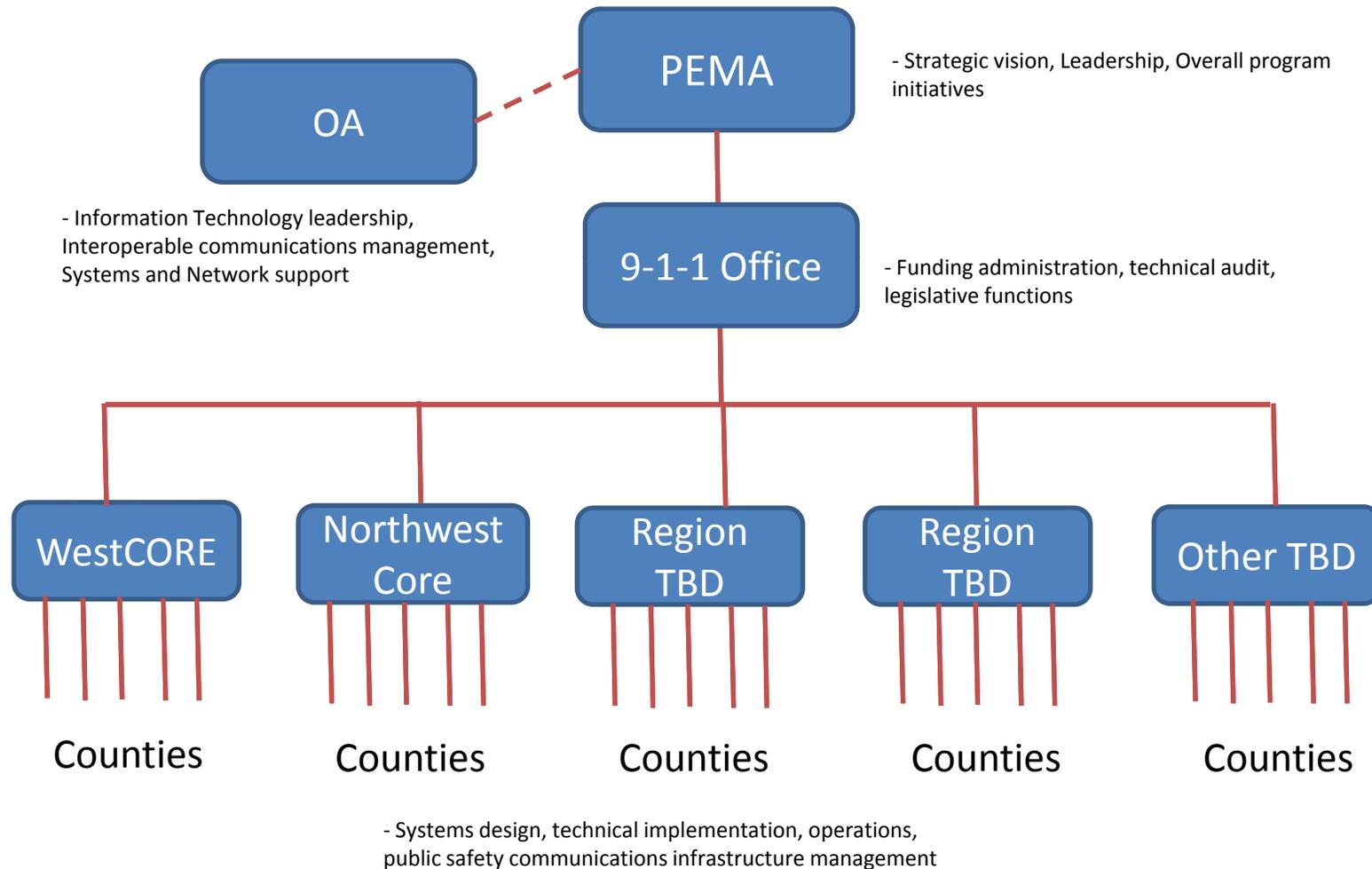
Governance

- PEMA supports the formation of intergovernmental agreements and memorandums of understanding (MOU's) ensuring all agencies are maintaining a consistent set of rules
- PEMA suggests regionalization through the creation of representative working groups be formalized during the NG9-1-1 planning stages
- Each regional working group selects a representative or lead from their Region and creates a steering committee or governance body for the purpose of developing their regional NG9-1-1 configuration plan
- Representatives will assign working groups to investigate the essential ESInet and NG9-1-1 elements necessary for their region.

Governance (cont'd)

- PEMA suggests that a timeline, and tactical roadmap for assessing, surveying and procuring the components of an ESInet and ultimately the NG9-1-1- functional components

Governance model



Public Safety ESI net Broadband

Supporting Emergency Services Statewide



Emergency Services IP Network (ESInet) Functional Capabilities

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Emergency Services IP network (ESInet)

- Broadband IP network
- Utilized to converge technology
- ESInets are **NOT** NG9-1-1 but are the foundation on which NG9-1-1 will be built
- Provides or support for
 - call routing, transport, interoperability, security, and related services

Description

Technically an ESInet is an IP-based system comprised of:

- Managed networks
- Shared applications
- Ability to replicate E9-1-1 features and functions

Practically an ESInet will

- Improve access to emergency services for callers
- Improve the effectiveness and efficiency of emergency communications and response

Description (cont.)

- ESInet's may be County, Region or State-wide and:
 - Interconnect to neighbors
 - Helps expand mutual aid
 - Allow “any to any” communications
 - Encourage sharing of applications and systems
 - Can create cost efficiencies
 - Can increase response effectiveness

ESInet configuration

- Evolution into a broadband based infrastructure
- Enable centralized applications with redundant access
- Host (or provide access to) numerous shared services between PSAPs
- Support interoperability among the diverse, but standardized networks and applications.
- Enable wide information dissemination and queries for emergency incident information
- Bandwidth insensitive

ESInet Capabilities

- True redundancy
- Direct control of alternate routing for continuity of operations
- Pre-definition of disaster routing
- Inter-network access to other PSAPs
- Inter-network access to other databases
Example: HAZMAT Information

9-1-1 Technology Landscape

Today's Systems	Tomorrow's Systems
40 year old legacy technology Difficult to adapt to change Proprietary	Future oriented Plug and play Based on open standards
Analog Fixed - dedicated	Digital Dynamic - interoperable
Primarily voice Limited data capability	Advanced data capability Text, images, crash notification
Local access Limited transfer and backup	Long distance access Expanded transfer and backup

The core purposes of NG9-1-1

ESInets support the entry into NG9-1-1:

- Fully replace Enhanced 9-1-1, with all capabilities and functions in place today
- Add capabilities to support changes for current and new types of Originating Service Providers
- Add flexibility for the PSAPs and 9-1-1 Authorities
- Add capabilities to integrate and interoperate with emergency entities beyond the PSAP

Fully replace Enhanced 9-1-1

- Replicate all features of E9-1-1 with IP-based, software and database versions
- Seamlessly support all existing calling types
- No service disruption during transition

▶ Add capabilities to support changes for Service Providers

- New wireless based services
- Additional messaging services
- Direct handling of telematics
- Special needs community applications and tools to aid in reaching assistance
- Common interface for developers
- Access to information available in external databases

Add flexibility for PSAPs and 9-1-1 Authorities

- Transfer calls and data between PSAPs and other entities within the NG9-1-1 system
- Direct control of system functions and dynamic routing
- Share applications and costs
- Disaster related call control
- Malicious call control
- Programming of the NG9-1-1 system to operate the way 9-1-1 governing authorities desire

Add capabilities beyond the PSAP

- Immediate connection to other emergency response entities
- Interaction with 211, 311, N11s
- Sharing of infrastructure with non-PSAP entities

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