

# **9-1-1 In Context**

**July 19<sup>th</sup>, 2012**

**Wisconsin Legislative Council**

# About NENA

- Primary standards development organization for 9-1-1 systems and service processes.
- 7000+ public safety and 9-1-1 industry members.
- The only professional organization solely focused on 9-1-1 policy, technology, operations, and education issues.

Video Courtesy Mobile Future



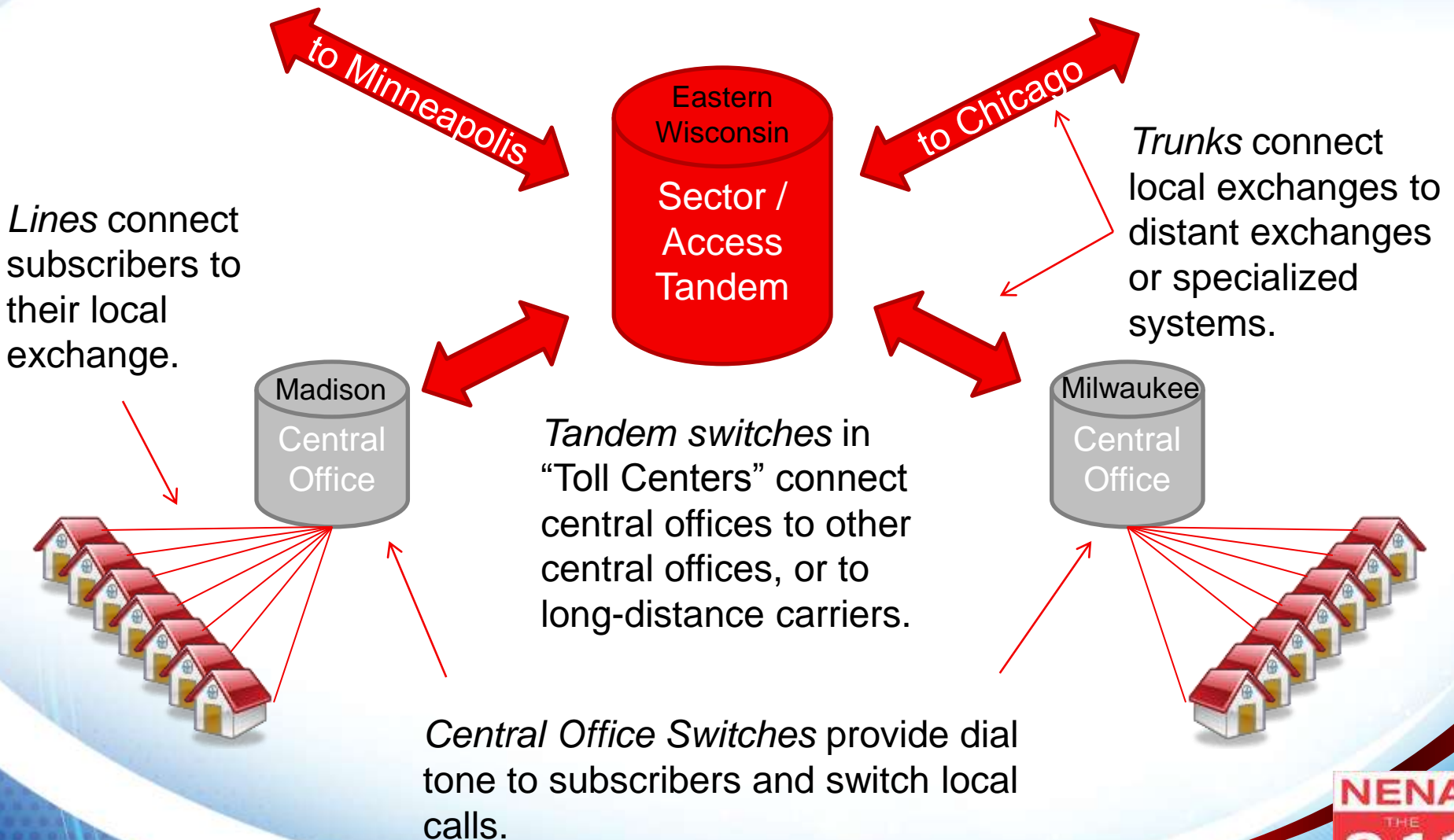
# Focus

How does 9-1-1 work?

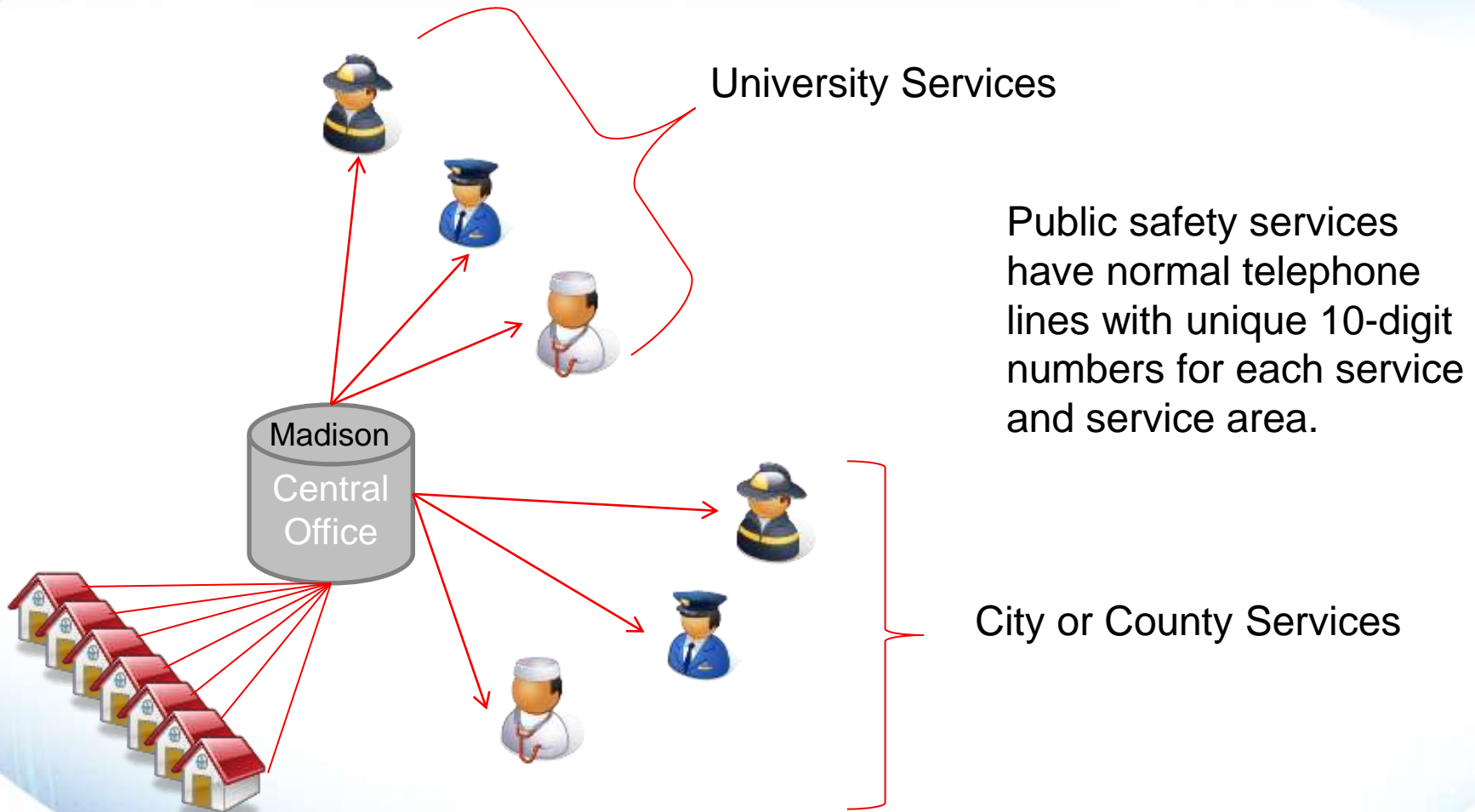
# Frame of Reference

- NG9-1-1 is not simply a swap of circuit switched technologies with IP technology
- NG9-1-1 involves shared networks, shared databases and shared applications
- PSAPs and local 9-1-1 systems will no longer be islands, separate and unconnected to neighboring systems
- Planning and implementation is a complex process that requires an unusual degree of collaboration among involved stakeholders

# Public-Switched Telephone Network



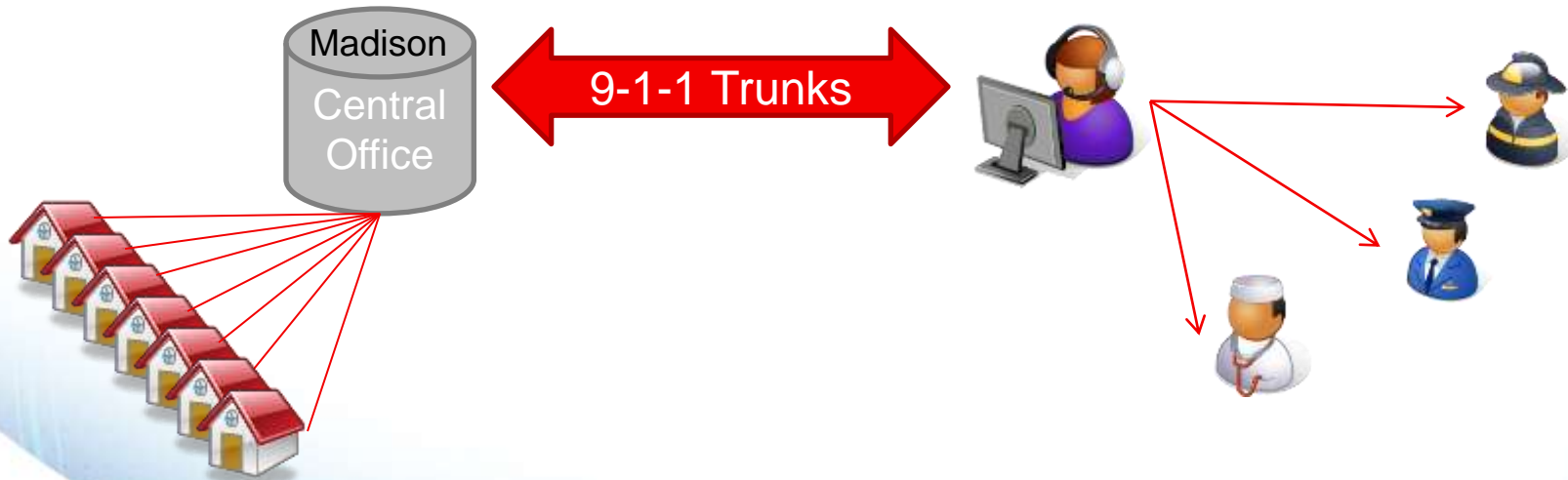
# Before 9-1-1 Deployment



Public safety services have normal telephone lines with unique 10-digit numbers for each service and service area.

# Basic 9-1-1 Service

- Dedicated 9-1-1 trunks connect *one* central office to *one* primary PSAP.
- Calls ring at the PSAP with no associated data and without regard to the geographic location of the caller.
- Calls may then be dispatched from the primary PSAP, or transferred to secondary, service- or jurisdiction-specific PSAPs using ordinary 10-digit telephone numbers.





# Wireline Enhanced 9-1-1 Databases



## Master Street Address Guide

Populated by county government. Contains every valid road name and number range in a jurisdiction.


Telephone company validates customer addresses against MSAG when new service is established.



## Selective Routing Database

Maintained by telephone company. Contains routing instructions for area PSAPs.

Central Office switch software queries database for routing instructions when a 9-1-1 call is placed.



## Automatic Number Identification

Maintained by telephone company. Contains telephone number for each subscriber line.

Telephone company pushes subscriber number to PSAP via data channel at call setup time.

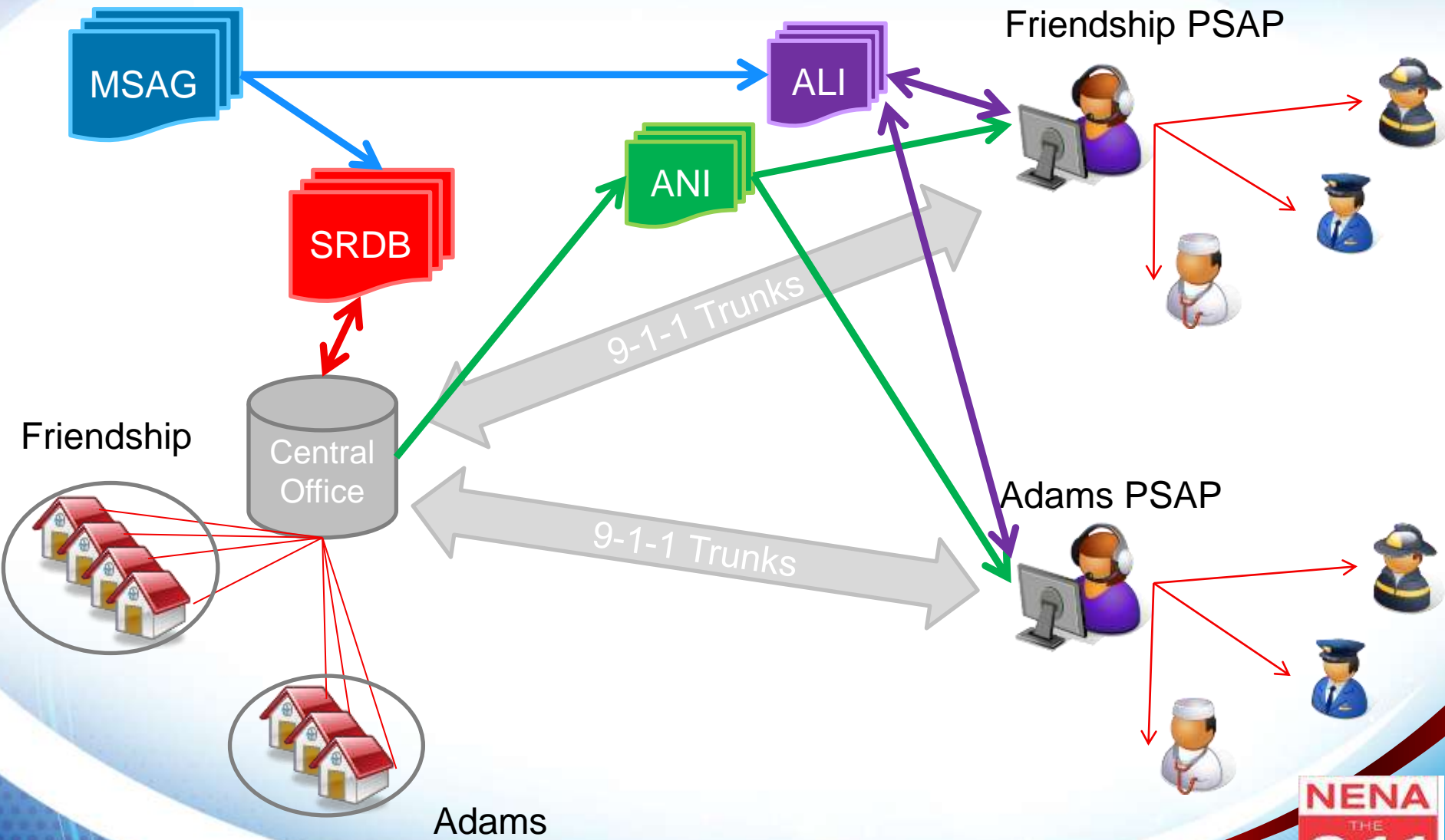


## Automatic Location Identification

Maintained by telephone company. Contains MSAG-valid street address for each subscriber line.

PSAP queries database using ANI information and receives subscriber address.

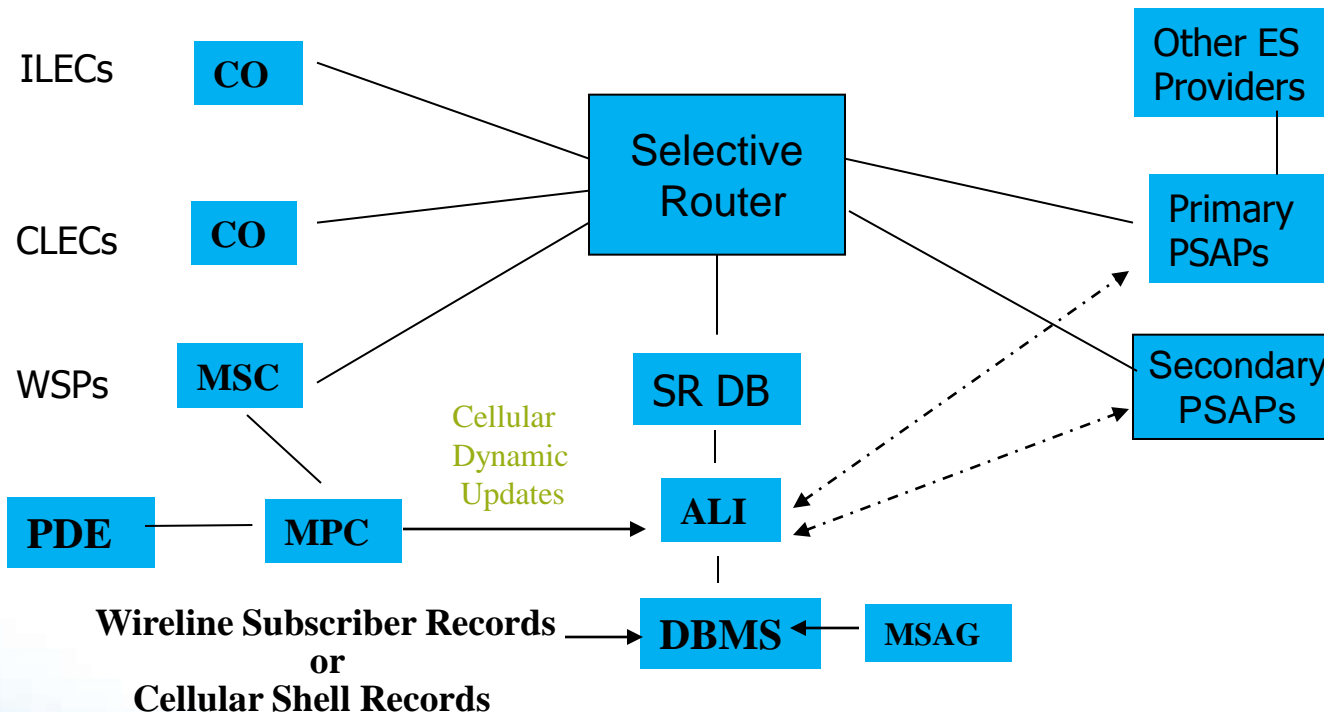
# Wireline Enhanced 9-1-1 Service



# Add Cellular E9-1-1 Components

## Originating Calls

## Emergency Service Providers

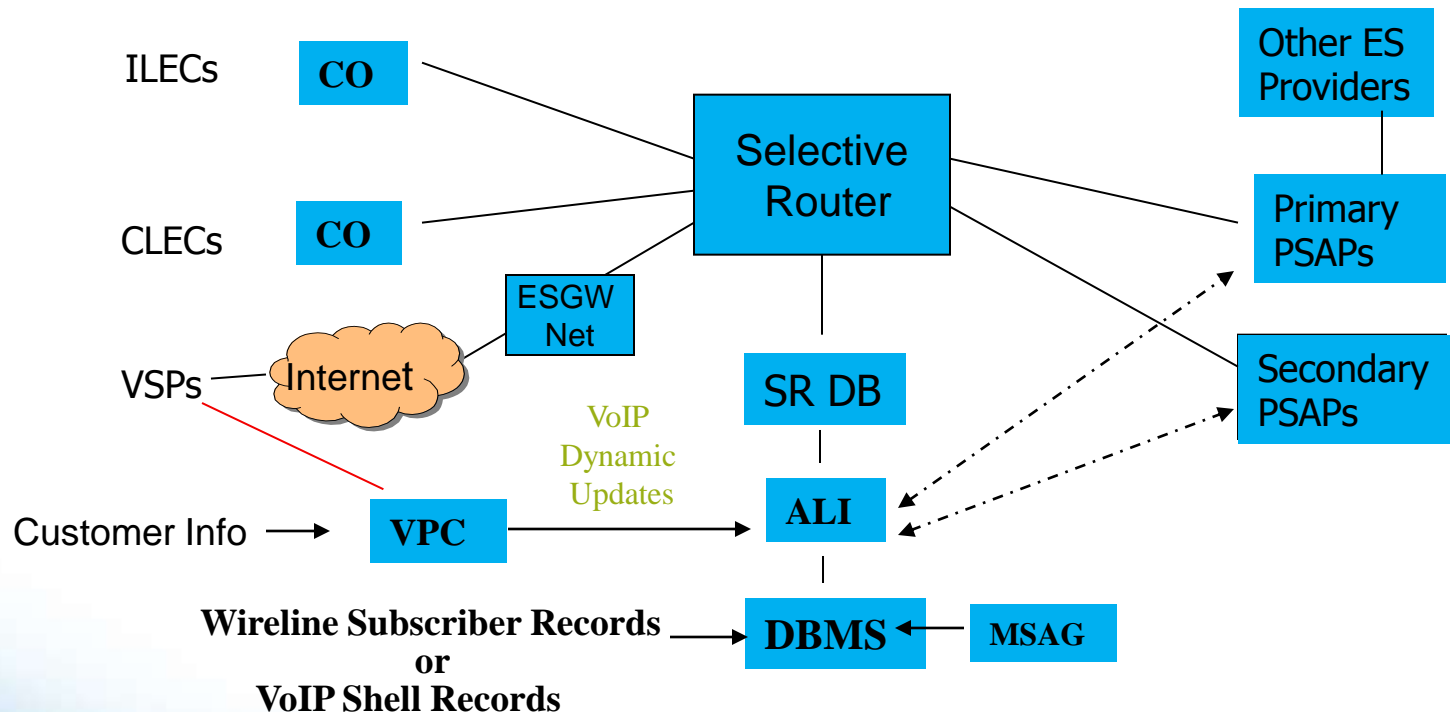


Difficult and costly to integrate new call or messaging sources, and the corresponding data needs

# Adapt for VOIP - E9-1-1 Components

## Originating Calls

## Emergency Service Providers



Difficult and costly to integrate new call or messaging sources, and the corresponding data needs

# How We Communicate

- By 2014, most internet traffic will be mobile.
- Voice communications account for only 1/3 of mobile usage: 2/3 are apps, text, & video.
- Approximately 32% of adults and 36% of children live in wireless-only households.

# How We Communicate

- More than 8 trillion texts were sent last year.
- Teens text ~5,500 times *per month*.
- 35 million Americans who are deaf or hard of hearing rely on texting.
- IP-based messaging services such as iMessage or BBM are beginning to displace SMS.

# What's Driving NG9-1-1?

- The need to “mainstream” 9-1-1 technology.
- Needed improvements in survivability.
- The critical need to improve interoperability and information sharing.
- A desire to increase competition and innovation in public safety technology.

# Built-In Interoperability

- NG 9-1-1 is:
  - An open standards-based platform
  - Using modern, flat IP architecture
  - With robust security and resilience features
  - Based on Commercial Off The Shelf (COTS) technology
  - Designed to be originating-service agnostic.



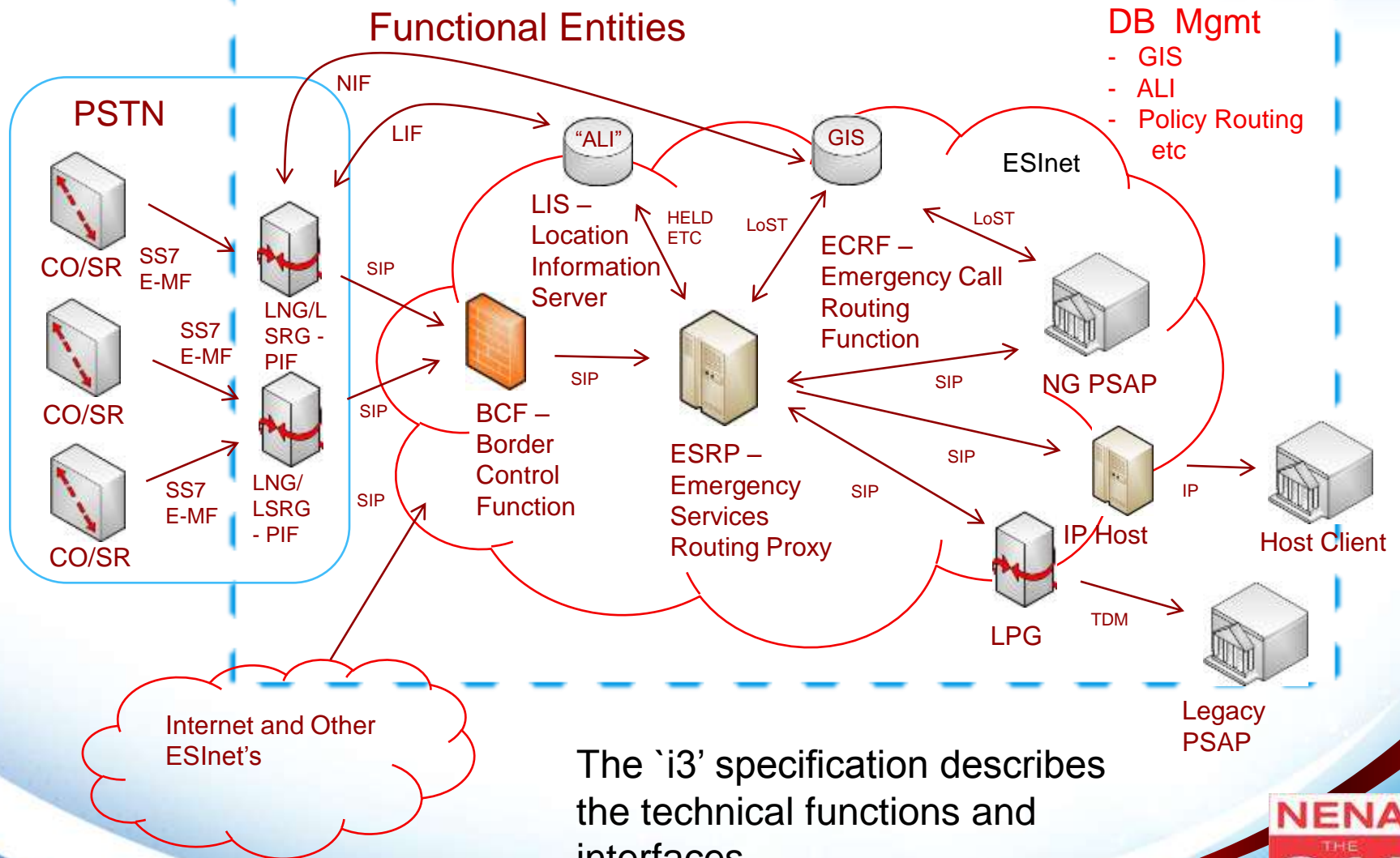
# Designed-In Capabilities

- Text/IM to 9-1-1
- Files to 9-1-1 , such as photos or video clips
- Streaming video
- Telematics and sensor data
- Nomadic and/or mobile call taker workstations

# NG9-1-1 Responder Benefits

- Allows seamless flow of data from consumer to call-taker to dispatcher to responder.
- Leverages existing national standards for interfaces and data structures.
- Provides an adaptable platform to meet future responder needs.

# NG9-1-1 System



# E9-1-1 vs NG9-1-1

- Complex analog trunking and data network
  - Class 5 switch for Selective Router
  - Translation based control
  - Limited to voice calls
  - Data bandwidth 20 char
  - Complex Emergency Gateway Network for VoIP
  - Custom interfaces for each service type
- Engineered, managed IP networks (ESInet)
  - IP software selective routing function
  - GIS and database controls
  - Voice, text, video
  - Bandwidth unlimited
  - Direct handling of Internet sourced calls
  - Standard IP interface for all service types

# Terminology

- **ESInet**

A privately managed IP transport network that supports the core routing functional entities necessary for NG9-1-1 call delivery; these include but are not limited to: the Emergency Services Routing Proxy (ESRP) and the Emergency Call Routing Function (ECRF). An ESInet can support other Emergency Services applications and is shared by all agencies which may be involved in any emergency.

- **i3 Standards (requirements, architecture and specs)**

The functional applications/services that form the core of NG9-1-1 and run on the ESInets.

- **NG9-1-1**

The set of network elements, software applications, databases, CPE components, and operations & management procedures required to provide next generation emergency services.

# Policy Considerations

- 9-1-1 is a *distinct* public safety service and requires specialized training and education.
- 9-1-1 is a tremendous source of actionable data that can improve municipal and state services.
- NG9-1-1 may not be here yet, but a foundation can be laid *now* to ensure a smooth transition.
- 9-1-1 fees paid by consumers should support the services it's supposed to.
- Legacy regulations must be updated to support NG9-1-1, and critical near-term issues like interconnection must not be avoided.

# To Learn More

- NENA's i3 Standard for NG9-1-1 is available online at: [www.nena.org/?page=Standards](http://www.nena.org/?page=Standards).
- Other NENA standards for NG9-1-1 may be relevant to the interoperability of network and subscriber devices with NG9-1-1, and should be reviewed by the Board.