NATIONAL EMERGENCY NUMBER ASSOCIATION

tampa
9-1-1

VoIP: Evolution of the PSAP Experience

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Growth of 9-1-1

9-1-1 Continues to Evolve….

- Since the first 9-1-1 call was completed on Feb. 16, 1968 in Haleyville, AL, the role of 9-1-1 has greatly expanded.
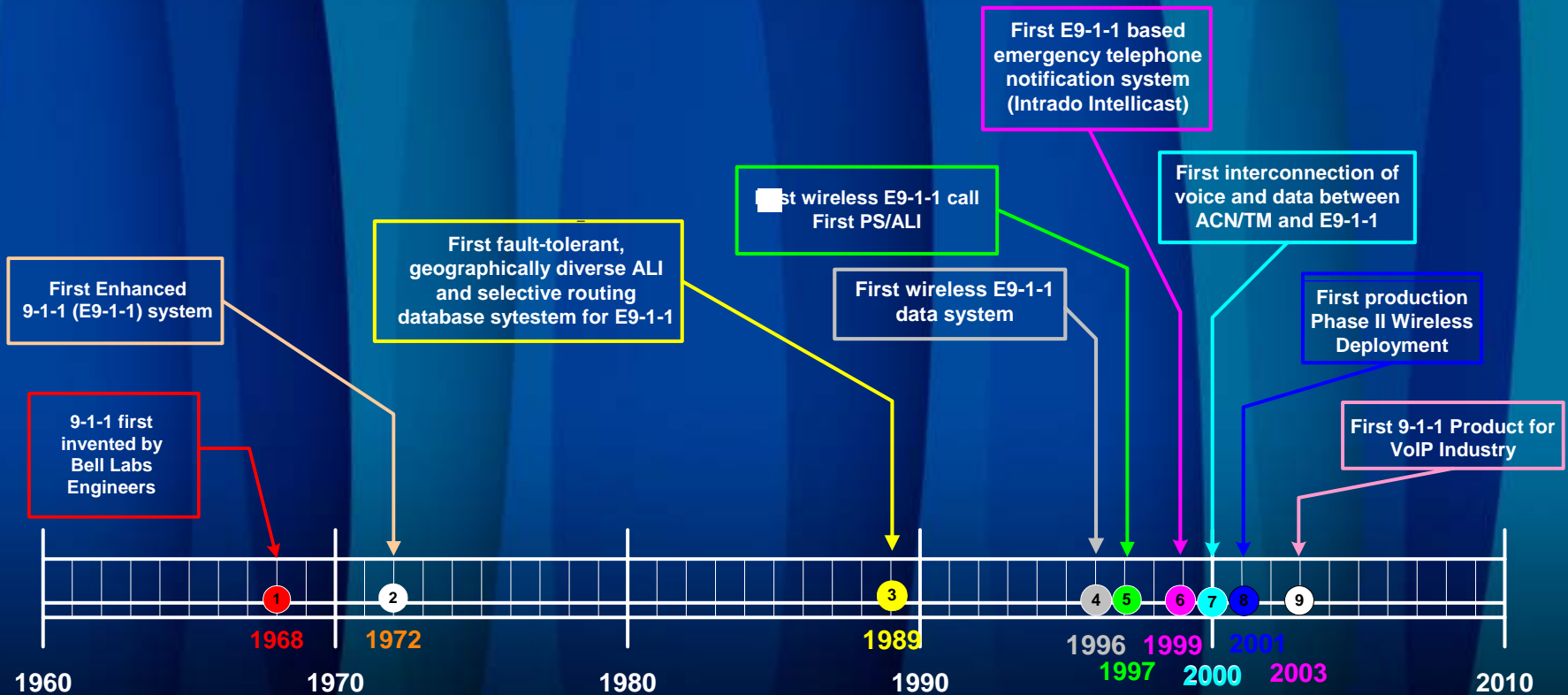
> Voice → Enhanced 9-1-1 → PS/ALI → Wireless Ph.1→ Ph.2 → ACN → VoIP

- VoIP 9-1-1 Calls Are Growing Quickly and Need Emergency Services

Growth of 9-1-1

## *36 Years Has Brought Tremendous Change*

First E9-1-1 based emergency telephone notification system (Intrado Intellicast)

First interconnection of voice and data between ACN/TM and E9-1-1

First wireless E9-1-1 call First PS/ALI

First Enhanced 9-1-1 (E9-1-1) system

First fault-tolerant, geographically diverse ALI and selective routing database sytestem for E9-1-1

First wireless E9-1-1 data system

First production Phase II Wireless Deployment

9-1-1 first invented by Bell Labs Engineers

First 9-1-1 Product for VoIP Industry

1 1968
2 1972
3 1989
4 1996
5 1997
6 1999
7 2000
8 2001
9 2003
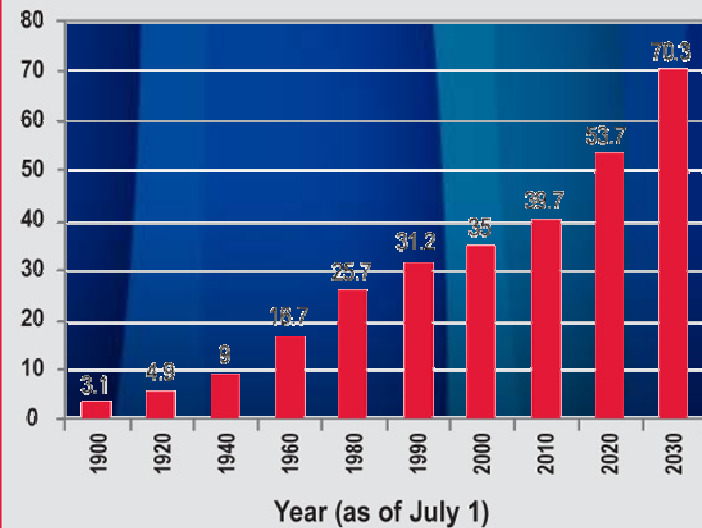
1960
1970
1980
1990
2010

Growth of 9-1-1

Retiring Baby Boomers Bring Growing Need for Emergency Services

13% Increase in Persons 65+ Over Next 5 Years

Older Population by Age: 1900-2050
Percent 65+ and 85+
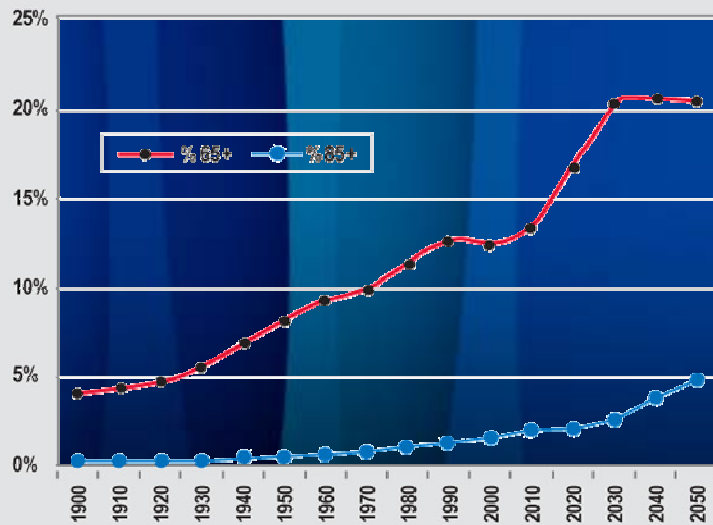
Figure 1: Number of Persons 65+
1900-2030 (numbers in millions)

Year (as of July 1)

Charts developed by the U.S. Administration on Aging based on Census Bureau data.
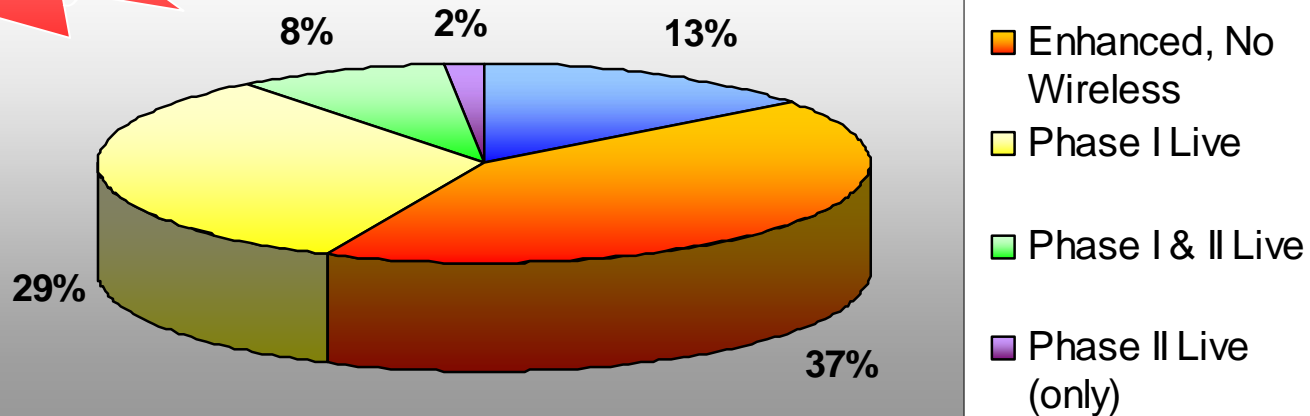
Growth of 9-1-1

Each PSAP Focused on Next Challenge

- All Statistics Approximate as of June 2004
- 333 Counties with 2% of U.S. Population Not Served by 9-1-1
- 7200 U.S. PSAPs with 9-1-1

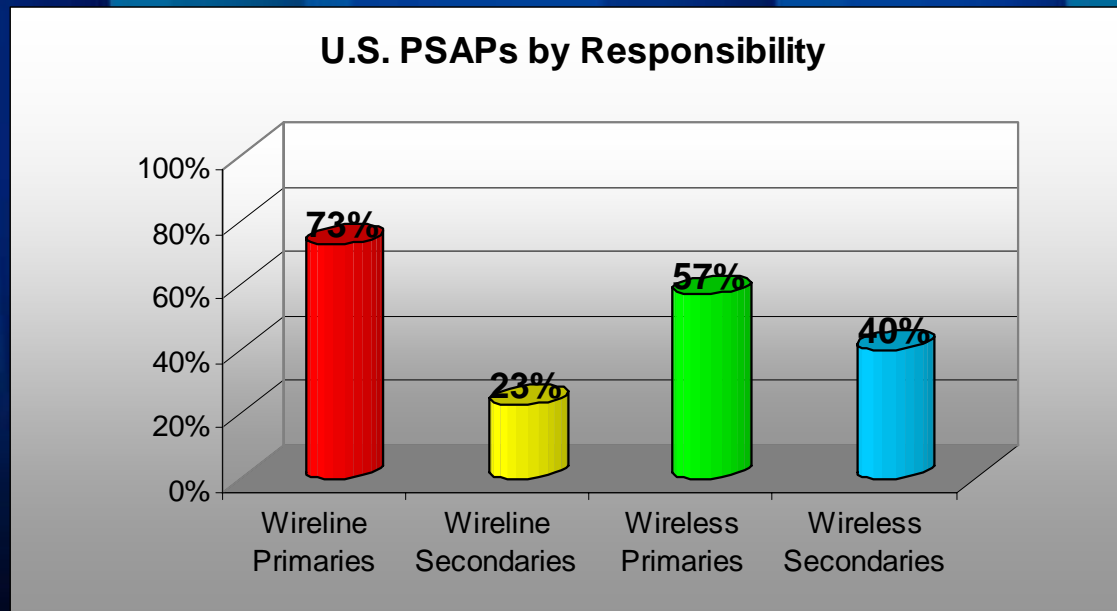**10% of PSAPs Receive X, Y Location Today**

2004 PSAP Statistics

Legend	
■ Basic 9-1-1	13%
■ Enhanced, No Wireless	37%
■ Phase I Live	29%
■ Phase I & II Live	8%
■ Phase II Live (only)	2%

Growth of 9-1-1

PSAP Viewpoints Vary by Responsibility

- Some PSAPs Responsible for Wireline, Wireless and Now VoIP – Others Focused Only on One Challenge
  - Assume 7200 U.S. PSAPs with 9-1-1

U.S. PSAPs by Responsibility

Wireline Primaries: 73%
Wireline Secondaries: 23%
Wireless Primaries: 57%
Wireless Secondaries: 40%

Growth of VoIP

Cost and Mobility Driving VoIP Market Growth

- Carrier Drivers
  - VoIP brings cost savings and revenue growth
  - Reduced costs moving to a data network for all traffic
  - Revenue growth from combined Voice and Data services
- Customer Drivers
  - Residential Consumers Seek Price Savings and Enhanced Services
  - National Number Portability
  - Consumers Expect 9-1-1
- Mobility becoming Common Key Market Driver
  - Mobility via Wireless continues to grow at 10.4%
 - Move office phone among locations

Growth of VoIP

VoIP Growth Following Wireless Growth Pattern

- Total VoIP Growth

  - Frost and Sullivan project 40% of calls will be carried over VoIP in 2007.

  - FCC Projects an Annual 7% Decline in Wireline TNs

- VoIP Residential Growth

  - VoIP penetration is projected at 17% households with broadband

- VoIP Business Growth

  - Small business: 800% Growth from 2004 to 2008

  - Medium to Large business: Compound annual growth rate of over 50%.

  - IP PBX lines overtake traditional PBX lines in 2004

Growth of VoIP

13.5% of All 2008 Residential 9-1-1Calls from VoIP

Projected VoIP Residential 9-1-1 Calls
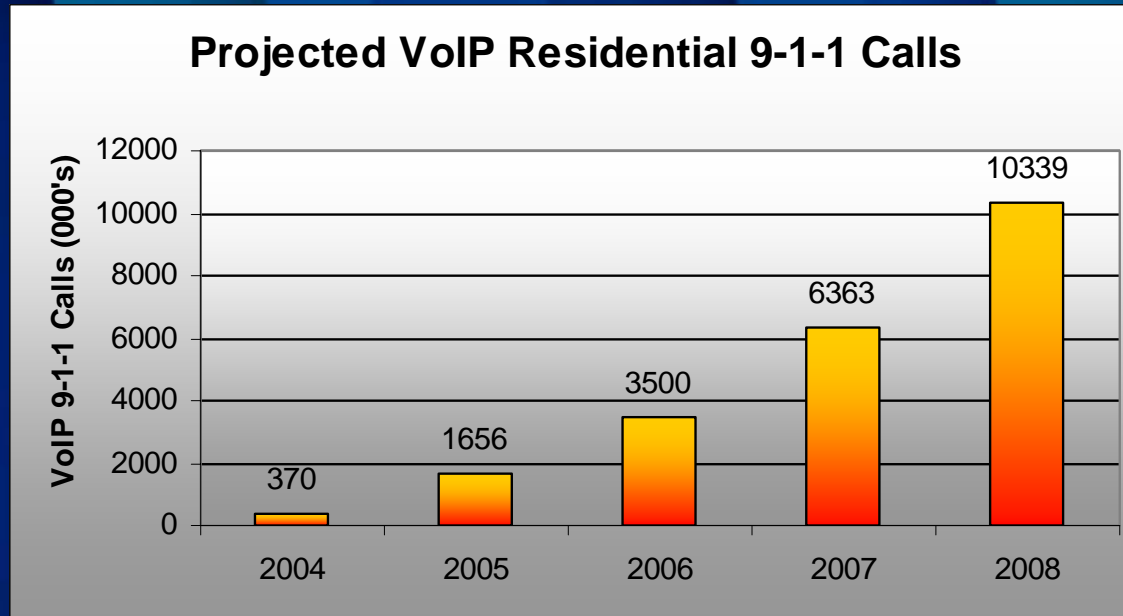
- Key Assumptions:
  - Residential VoIP Subscribers Growth per Frost & Sullivan, April 2004
  - 200M 9-1-1 Calls per Monitor Group, December 2003; Assume 13% growth in 9-1-1 calls over 5 years
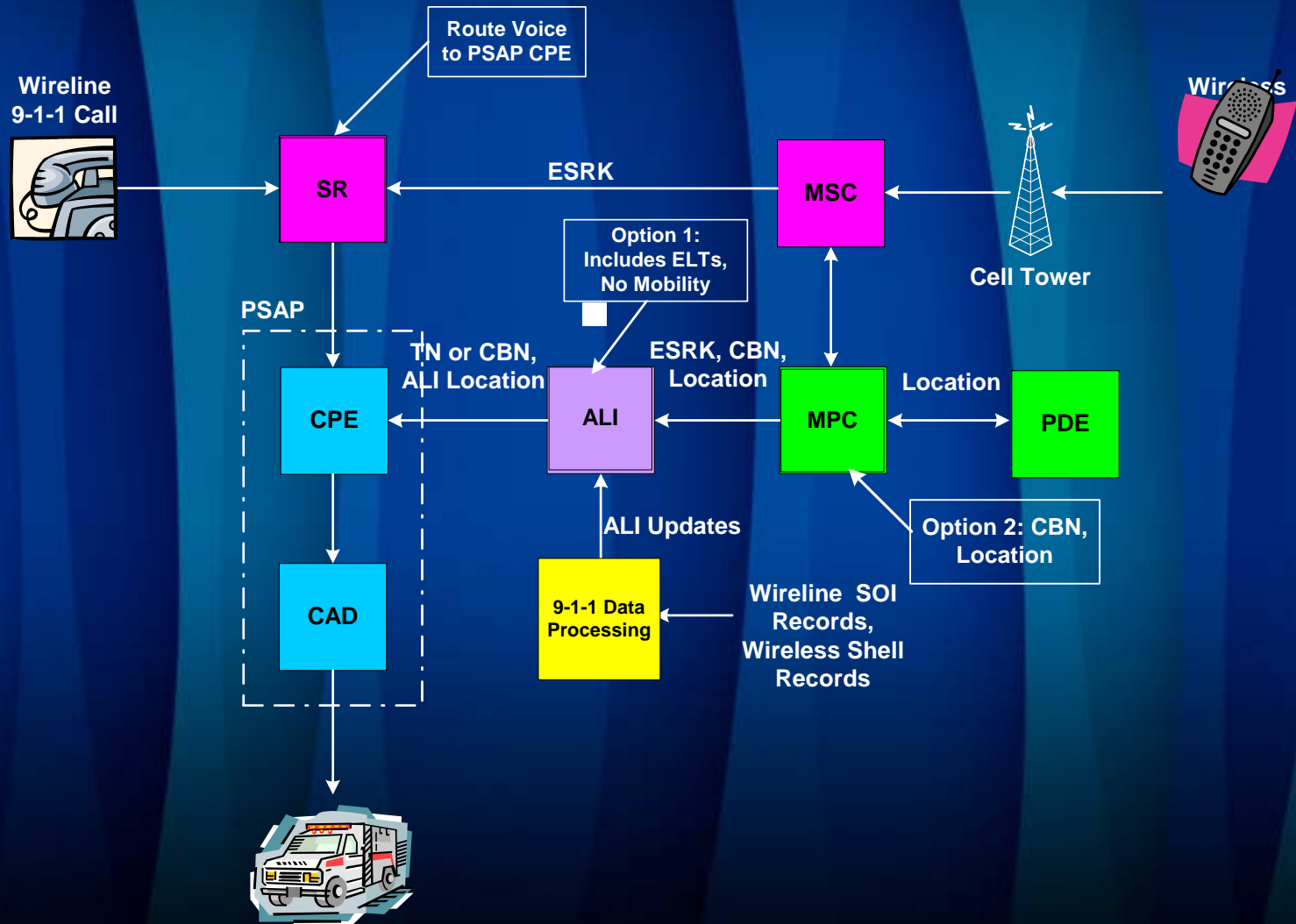 - 33% of all 9-1-1 Calls have a Residential COS

VoIP E9-1-1 Vision

Must Satisfy Core Requirements to Achieve I2

- Core Requirements for VoIP E9-1-1
  - Voice Delivery to PSAP
  - ALI Delivery to PSAP
  - Route VoIP Calls to Correct PSAP
  - Use Existing ALI Format
  - Resolution of Legal Issues

VoIP E9-1-1 Vision

VoIP Calls Need Access to 9-1-1 Infrastucture

VoIP E9-1-1 Vision - Voice

Voice Delivery to PSAP Requires Routing to 9-1-1 Tandem Selective Routers

- Physical Connectivity
  - Each 9-1-1 VoIP Provider Needs Connectivity to 100s of U.S. Selective Routers
- Regulations and Access
  - Tariffs and Access Regulations Under Discussion
  - Brief Trials Scheduled to Demonstrate Feasibility
  - Selective Router Access Not Seamless Across U.S.
    - Non-Native TNs Must Use pANI for Routing
- Selective Routing Tables
  - Some ALI Solutions Do Not Enable PSAP Selective Transfer

VoIP E9-1-1 Vision - ALI

Both Options for ALI Delivery Have Pros & Cons

- Option 1: Add VoIP Records to Regional ALI Databases
  - Advantages: MSAG Valid Addresses, ALI Response Includes ELTs
  - Disadvantages: Does Not Support 'Nomadic' VoIP Calls or Non-Native TNs
- Option 2: Regional ALI Steering to Obtain CBN & Location
  - Similar to Wireless ALI Delivery
  - Advantages: Supports pANIs for Non-Native TN Routing, Supports Nomadic VoIP Calls
  - Disadvantages: May only include X, Y location and No Address, No ELTs or Selective Transfer
- Intrado Advocates MSAG Valid Address for VoIP
  - Some VoIP 9-1-1 Providers Using ALI Option 2 May Only Provide X, Y, even for Fixed, Residential VoIP Services.
  - Intrado Believes All ALI Responses for Residential 9-1-1 Calls should contain an MSAG Valid Address.

VoIP E9-1-1 Vision - PSAP

- Calls Routed to Appropriate PSAP
  - Intrado advocates NENA's Position
    - "VoIP Calls Should Be Routed to Wireline Primary PSAPs"
- Intrado Interim 'I1' Solution Migration In Process
  - 40% Intrado I1 Calls Routed to Wireline PSAPs Today
  - Call percentage will grow as Intrado gathers additional Wireline PSAP geographic boundary information
    - PSAPs May Contact Intrado to Provide information
  - Once data validated and processed, Wireline PSAP boundaries used for Intrado's "I1 Solution" routing
- No Impact to PSAP Systems
  - Use Existing ALI Format
    - Separate COS Designators?
    - Shell Record Content?

VoIP E9-1-1 Vision - ALI

Can the VoIP ALI Response for Residential 9-1-1 Calls Mirror Wireline ALI?

VoIP COS Designator(s)?

For ALI Option 2, if the response 'times out,' PSAPs will only receive a Shell Record with no TN or CBN

pANI Dialable or Non-Dialable?

Sample 512-Byte ALI Response

```
X01
(720) 494-6232 VOIP 05/11 15:53
JOE SMITH
1601          P#303-195-1500
DRY CREEK DR

Location Information      001 00515
CO LONGMONT
Additional Comments    TEL=VNAGE
40.137571   -105.138202 100.00%
LONGMONT PD
LONGMONT FD
BOULDER COUNTY EMS
```

Not All VoIP 9-1-1 ALI Responses Will Contain A MSAG Valid Address

MSAG-Valid Only Addresses Means No Auxilary Location Information

Shell Records May Not Contain VoIP Carrier Company ID

E9-1-1 or Phase 1 Only PSAPs Won't Receive X, Y Location

ELTs Require VoIP Records in Regional ALI or ALI Provider Tariff for MSAG/ ESNs

VoIP E9-1-1 Vision - Legal

- Status of Regulation for VoIP E9-1-1
  - FCC Collecting Comments on Regulation (www.fcc.gov/voip)
  - Several States Considering State Level Legislation
- Cost Recovery for VoIP 9-1-1 Calls
  - Intrado Believes all Companies should be Good Corporate 9-1-1 Citizens and Contribute
  - Several States Considering Legislation on Appropriate Cost Recovery for VoIP 9-1-1 Services
  - Every 9-1-1 Caller Expects Same Level of Service
  - VoIP Callers Currently Denied Access to E9-1-1
  - VoIP Callers Should Pay 9-1-1 Surcharges for Equal Service
  - AT&T Voluntarily Collecting and Distributing 9-1-1 Surcharges

VoIP I2 Outstanding Issues

Intrado Dedicated to Industry Collaboration to Enable VoIP E9-1-1 Services

- Regulatory Mandates

- Funding for VoIP 9-1■1 Services

- E9-1-1 Infrastructure Access and Tariffs

- MSAG Valid Address Requirement

- ALI Display Format

Questions and Follow-Up

- Visit Intrado's VoIP Information Web Page:

  www.intrado.com/voip

- Email with Questions

  voip@intrado.com