Next Generation 9-1-1

Briefing to the North Dakota Public Safety and Transportation Committee

October 15, 2009

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Agenda

Overview of Next Generation 9-1-1
Review of the North Dakota NG9-1-1 Planning Report



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NEXT GENERATION 9-1-1 OVERVIEW



Today's 9-1-1 System – Timeline

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Background

9-1-1 is not broken, but working well

- Designed to provide single 3 digit dialing from landline to reach emergency response
- Automatic Number and Location ID added and integrated well
- Wireless capability added through considerable system modification and effort
- Voice over Internet Protocols (VoIP) capability added but still has limitations
- Other limitations

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Other Limitations

- Cannot support all current devices
 - Unregistered nomadic VoIP caller
 - Mobile VoIP caller
- Unable to access caller generated data
 - Text messaging (critical for hard of hearing)
 - Images
- Local
 - Does not support call taking by geographically dispersed PSAPs

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Other Limitations (continued)

- Not Interoperable with
 - Emergency responders
 - Other emergency services
- Cannot access other available information
 - Advanced telematics
 - Building plans
- And what about the next new technology?
 - Need to integrate more rapidly

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Hatfield Report

- FCC requested an independent report on the status of 9-1-1 in the Country.
- Six Month Study starting in April 2002
- Outlined a status, and a road map to deploying wireless 9-1-1
- First flag on the need to upgrade the wireline 9-1-1 Network.

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Hatfield Report

"... one over-arching issue that immediately emerged in my inquiry is that the existing wire line E9-1-1 infrastructure, while generally reliable, is seriously antiquated. Indeed, it turns out that the existing wire line E9-1-1 infrastructure is built upon not only an outdated technology, but also one that was originally designed for an entirely different purpose. It is an analog technology in an overwhelmingly digital world. Yet it is a critical building block in the implementation of wireless E9-1-1."



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NENA Future Path Plan

- Began to look at the impact of new technology on 9-1-1
- Plan to get ahead of these new technologies



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Next Generation 9-1-1

 NG9-1-1 is best described as a robust system of systems that will allow the public to use any device to request help or send information to the appropriate public safety agency

Makes use of open standards

Must have access to shared data

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What is the Difference?

Today's 9-1-1	Next Generation 9-1-1
40 year old legacy technology	Future oriented
Difficult to adapt to change	Plug and play
Proprietary	Based on open standards
Analog	Digital
Fixed - dedicated	Dynamic - interoperable
Primarily voice	Advanced data capability
Limited data capability	Text, images, crash notification
Local access	Long distance access
Limited transfer and backup	Expanded transfer and backup



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This is NG9-1-1

NG9-1-1 Community Model

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NG9-1-1 PLANNING REPORT

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Introduction

- NDACo & ND9-1-1 Association
- Goals of the project
 - Describe a NG9-1-1 Strategy
 - Estimate Budgetary costs
 - Develop timeline to implement
- Project resulted in three tasks
 - Evaluation
 - Conceptual Design
 - Master Plan

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Methodology

Gathered Information

- Meetings/Interviews/E-Mail
- Site Visit
- Document Review
- Research
- Applied Best practices and experience
- Costs based on current values, no future cost of money was applied

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Findings

- 23 PSAPs (including 1 in SD)
- Most PSAP CPE is Analog
- Most of the Equipment is reported to be upgradeable to IP by the vendors
- 2 Qwest Selective routers in ND (1 in SD)
- Selective routers not providing Dual feed to PSAPs
- 6 PSAP Served by Local trunks (Not S/R) for wire line service

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Preliminary Design

Components

- IP Transport
- NG9-1-1 Services
- Call Termination Functions



IP Transport

- Rural vs. Urban
- Types of technology
 - MPLS
 - Ethernet
- Bandwidth
- Network Management
- Service Level Agreements
- Transport Topology
 - Bus (Point to Point)
 - Ring
 - Star
 - Mesh

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NG9-1-1 Services

- Border Control Function
- Emergency Call Routing Function
- Location Validation Function
- Legacy Gateway

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Border Control Function

- Entry Point of the ESInet
- Conversion
- Security
 - Validation
 - Inspection
 - Certification



Emergency Call Routing Function

- Emergency Service Routing Proxy (ESRP)
- Location to Service Translation (LoST)
- Policy Based Routing Function (PRF)
- Supportive Data
- Bridging

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Location Validation Function

Location to Service Translation (LoST)
Location Information Server (LIS)

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Legacy Gateway

- Gateway to convert CAMA to IP
- Location Information Server (LIS) to request ALI form legacy ALI Database
- Session Initiation Protocol (SIP) Server or Proxy may be needed



Call Origination

- Location Information Server (LIS) to host or request ALI from legacy ALI Database
- Session Initiation Protocol (SIP) Server or Proxy
- This will depend on the service provider

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Call Termination Function

PSAP Equipment

- May also include:
 - Remote location ACD incorporating transfer and call bridge capabilities
 - Business rules database
 - Call record database
 - Supplemental data access
 - Remote location workstations

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Data Services

- Location databases
- GIS Layers
 - Streets
 - Agencies
 - Matched with neighboring entities



Transition and Deployment Issues

- Local information control and access while storing the data and services in core locations.
- The flexibility for contingency plans
- Carriers may be reluctant to change their internal support systems
- May require legislative influence to allow interconnection
- Standards are still evolving for NG9-1-1 applications.
- Development of a detailed transition plan to include:
 - Implementation management
 - Technical consulting
 - Project management

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Transition and Deployment Issues

- Operational Changes after connecting to the statewide ESInet
- PSAP personnel trained to handle the new types of information
- PSAP personnel trained on new applications that make this possible.
- PSAPs information can be instantly shared across jurisdictions in the event of an emergency, natural or a man made.
- May require different skill sets than PSAPs have today. This may result in additional staff or retraining of existing staff.



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Preliminary Design



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Planning Recommendations

- Statewide Coordination
- Governance
- Legislative and regulatory Issues



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Deployment Timeline



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Estimated Costs

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	Year 2009	Year 2010	Year 2011	Year 2012	Year 2013	Year 2014
Non-recurring Equipment Costs	\$0	\$0	\$5,200,000	\$6,775,000	\$1,575,000	\$0
Recurring Service Costs	\$0	\$0	\$1,377,600	\$4,364,400	\$4,364,400	\$4,364,400
Professional Services	\$184,880	\$101,179	\$209,006	\$114,475	\$57,238	\$0
TOTAL	\$184,880	\$101,179	\$6,786,606	\$11,253,875	\$5,996,638	\$4,364,400

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OTHER INFORMATION

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Deployment Level Options

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Level	Advantage	Disadvantage		
State ESInet	 Cost of services shared by many entities Allows for equal levels of services across the state 	 Lack of local control, can only get those services available The State is still developing the services that will be provided 		
Regional ESInet	 Cost shared across group of entities Control of the service is closer to the entities 	 Control is closer, but not complete Not all wanted services may be available 		
Local ESInet	• Complete control	 May add too many levels of services due to the multiple levels of hierarchy that may delay calls Requires close monitoring 		

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Deployment Type Options

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Option	Advantage			Disadvantage		
	• Complete control		•	Complete responsibility		
Owned System	• Add services as nee	ded	•	Require new skills and staff to manage		
	• Contractual control		•	Contract may add steps to changes		
Managed Service	• Able to make chang contract)	ges as needed (within	•	Rely on another entity to manage system		

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Questions?

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