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EXECUTIVE SUMMARY

The State of Ohio's 9-1-1 Program Office contracted with L.R. Kimball to provide professional consulting services to develop an RFP for a statewide network and the core services component of a statewide Next Generation 9-1-1 (NG9-1-1) system. The purpose of this report is to provide a Report of Initial Findings to the State to help prepare Ohio for Next Generation 9-1-1.

The State of Ohio wishes to own the assets of the NG9-1-1 system and wants the state ESINet to be built within the Ohio Academic Resources Network (OARnet). The State will provide an ESInet that spans the entire state, providing every participating public safety answering point (PSAP), county or region with the opportunity to interconnect and receive emergency calls. There are currently 214 PSAPs in the state's 88 counties, 154 Primary PSAPs and 60 Secondary PSAPs, served by 47 telco vendors that the system will be built to accommodate. Morgan County is currently testing a host environment as part of the State's ESINet Test Pilot; 15 additional counties are expected to join.

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1. METHODOLOGY

Data Collection for this report was achieved by several different methods. The L.R. Kimball team held meetings with officials of the Ohio 9-1-1 Program Office and Ohio Statewide Emergency Services Internet Protocol Network (ESINet) Steering Committee and Technical Standards and PSAP Operations sub-committees, researched Federal Communication Commission documents and archived reports provided by L.R. Kimball in 2013 and utilized firsthand knowledge of NG9-1-1 projects in Cuyahoga, Franklin, and Hamilton Counties.

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2.   FINDINGS

2.1   Network

In January 2013, the Ohio Statewide ESINet Steering Committee conducted a survey of all County 9-1-1 boards and PSAPs. The responses to the survey indicated that 62 of 88 counties responded favorably to the NG9-1-1 initiative. The State envisions providing NG9-1-1 services to all 88 counties within the State using OARnet as the backbone for the Statewide ESInet as reflected in Figure 1. OARnet service level objectives such as service-level agreement's (SLA's) and 99.999 percent availability must be upgraded to meet NENA i3 standards. These upgrades are in progress. As of the November 2013 ESINet Technical and Operational Requirements report it was recognized that not all locations currently have access to OARnet. All 88 counties in Ohio must have access to the state ESINet with the local 9-1-1 authority having responsibility for the last mile (PSAP to Gateway). A State ESINet Test Pilot is currently underway in Morgan County with 15 additional counties set to join. It is the State's expectation that there will be PSAPs connecting to the network at different service levels as depicted in Figure 1. Customers will have the ability to accept full services including core services and hosted CPE from the State, accept State core services with PSAP owned CPE, or connect interoperable State core services to PSAP owned core services.
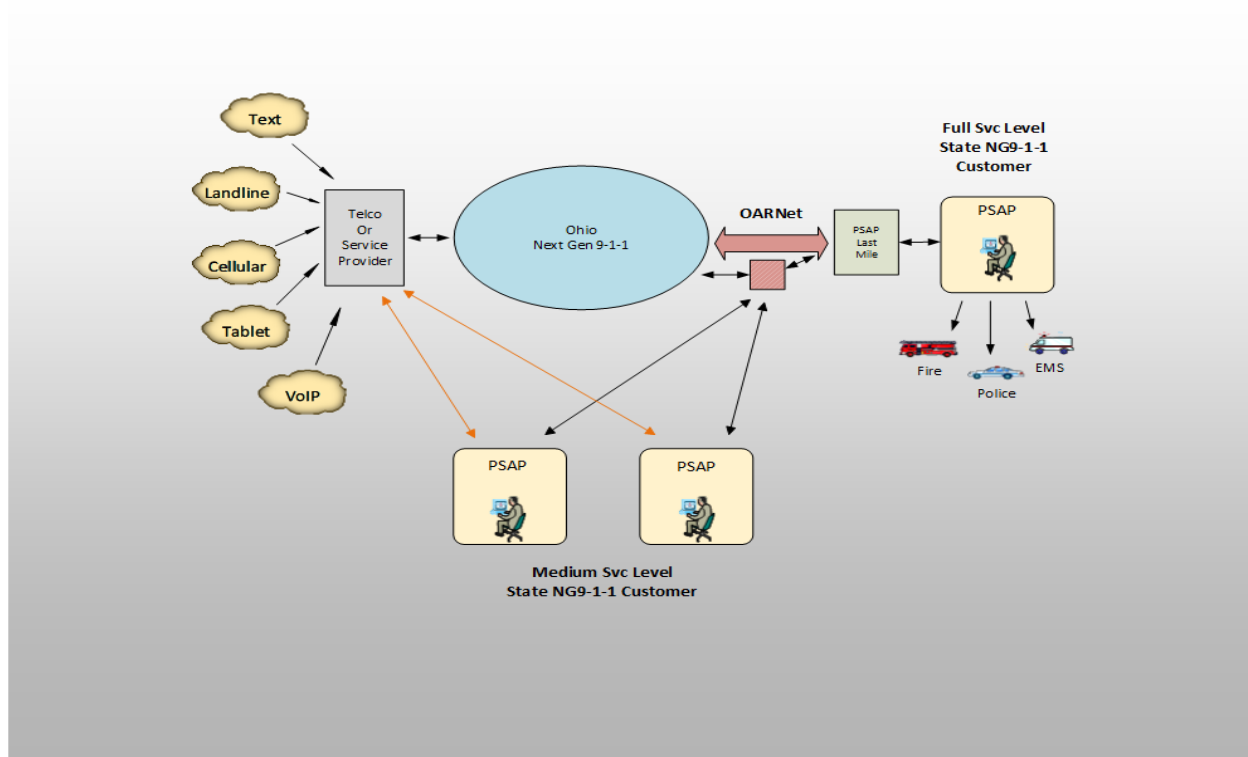

Figure 1 - State of Ohio Next Generation 9-1-1 System

2.2 Geographic Information Systems (GIS) Data

2.2.1 GIS Data for the Next Generation 9-1-1 System

Geographic Information Systems (GIS) play a far more critical role within the NG9-1-1 environment. Today, GIS is primarily used within the dispatch mapping modules in Computer Aided Dispatch (CAD) systems once the call reaches the PSAP. More and more, the integrity of 9-1-1 data is being put to the test as the emergency response industry transitions to Next Generation 9-1-1 and an increasing number of calls originate from wireless devices.

The current legacy 9-1-1 network uses customer telephone records and tabular databases listing street names, address ranges, etc. to determine which PSAP a 9-1-1 call should be routed to. The NG9-1-1 system will use a dynamic Geographic Information System (GIS) to make emergency call routing function (ECRF) and location verification function (LVF) decisions. Specific National Emergency Number Association (NENA) standards for this data are being finalized. The standards will ensure all NG9-1-1 GIS data nation-wide will be compatible.

Currently, numerous jurisdictions throughout the Country maintain GIS location data at the local level or within regionalized areas. These GIS datasets will be the base database for NG9-1-1, where all location related data is derived. Aggregating GIS data from numerous sources such as county, City, municipal or PSAP jurisdictions for provisioning within an ECRF and LVF system presents unique challenges for NG9-1-1 systems to properly function. It is imperative to establish the process and mechanisms necessary to assess, improve and maintain this localized GIS data into a single NG9-1-1 dataset. It is very important to build rules, policies and procedures to maintain authoritative boundaries for ESZ, PSAPS and Municipalities and establish a governance process for changes to boundary files, taking into account annexations and dissolutions, managing effective dates, providing for conflict resolution among neighboring PSAPs and generally enforcing topology rules for PSAPs.

GIS-enabled call routing requires accurate and up to date GIS data. It is imperative that local GIS data adhere to the proper data standards and that an effective plan for data maintenance is implemented. A critical step during this evolution is synchronizing your GIS databases with the Master Street Address Guide (MSAG) and Automatic Location (ALI) data. These databases should be based on a common dataset and consistent with a single standard. The objective is to achieve 98 percent accuracy, less than 2 percent "no records found" rate and minimal discrepancies.

Synchronization will reveal fictitious data, incomplete information and data that may only exist in one of the three databases. This component of the transition requires coordination and collaboration between local interest groups, other jurisdictions in the region, postal authorities, addressing authorities and other state, local and federal government entities. Because more than 50 percent of today's 9-1-1 calls are wireless, this will help to accurately display the callers location on a map display and ensure the proper responding agency is dispatched to the incident. This effort will facilitate local, regional and nationwide exchange of information and will greatly improve 9-1-1's ability to respond in the event of a multi-jurisdictional incident.

When it comes to synchronizing your GIS database, MSAG and ALI data, remember that GIS data of any size will contain errors. 9-1-1 entities should develop a succinct process that will consistently identify discrepancies in that data and quickly address errors as they are found. Maintaining high levels of coordination between databased

personnel, GIS personnel, database management system, the postal authority, local addressing authorities and all service providers will make this process more efficient.

2.2.2 GIS Data within the State of Ohio

The State of Ohio's 9-1-1 Program Office recognizes the importance of quality local GIS data in regards to developing the State's Next Generation 9-1-1 system and supports the State's efforts to acquire and maintain this data.

The State of Ohio developed the Ohio Location Based Response System (LBRS) to aid in its efforts to obtain accurate GIS data from participating counties across the State. This program is sponsored by the Ohio Department of Transportation and is administered by the Ohio Geographically Referenced Information Program (OGRIP) office.

The LBRS program currently has 81 out of 88 counties actively participating. Of these 81 counties, 80 have completed their respective projects and are maintaining and sharing quality data. One county, Coshocton County, is currently developing their data for inclusion in the program. Seven counties are not participating at the current time, although they have indicated that they are interested in future participation in the program. These counties are Belmont County, Geauga County, Hamilton County, Medina County, Scioto County, Union County and Warren County.

In addition to administering the LBRS response system, OGRIP currently offers statewide local imagery and the GEOhio Spatial Information Portal. OGRIP plans to continue to offer support to local governments and is working with the Ohio Department of Transportation to develop a repeatable process for maintaining data and to provide guidance for streamlining data replication.

The Ohio 9-1-1 Administrator and the Ohio Geographic Information Officer, are currently building relationships with PSAP's and vendors for GIS data/MSAG/ALI reconciliation and are working to establish a relationship with the Ohio Telecom Association and build a protocol for data acquisition and sharing. In addition, they continue to encourage local governments and PSAPs to develop Emergency Response Zones, PSAP boundaries and municipal boundaries, with annexations and effective dates recorded.

As part of the NG9-1-1 planning currently taking place, the State will need to discuss integrating all applicable GIS data into seamless statewide centerline and address layers, with the ability to convert the GIS data to the CLDXF format to support the ECRF and LVF as well as the nightly reconciliation of SOI updates from Telcos. Properly designed, the State could provide a centralized maintenance application to all of the addressing authorities throughout the State.

2.3   Customer Premise Equipment

The State of Ohio has 214 PSAPs within the state's 88 counties that are eligible for funding. Of these PSAPs, 39 percent are two-positions or less according to a PSAP Consolidation Report completed in November 2013 by L.R. Kimball. A recommendation for consolidation was included in that report. Under ORC 128.571 (and subsequent Attorney General Opinions), the State will currently provide funding from the 9-1-1 Local Government Assistance Fund, based on the 2013 PUCO funding disbursement levels, and counties can use the state funds to support up to four wireless PSAPs annually. On January 1st, 2018, the number of PSAPs a county can use state funds to support wireless PSAPs reduces to three annually. Counties can use state funding to support an additional wireless PSAP within a county that has a municipal corporation with a population of over one hundred seventy-five thousand. Under ORC 128.571, the state has also provisioned that if a county exceeds the allowable number of PSAPs using state

funds annually, disbursements to the countywide 9-1-1 systems will be reduced by fifty percent until the county complies with the limitations.

There are a variety of counties within the State currently operating with i3 capable systems including Franklin, Delaware, Cuyahoga, Hamilton, Marion in conjunction with the city of Cincinnati, and Morgan. The NG9-1-1 system RFP will be built to work with all 88 counties and will not require the replacement of any existing i3 capable CPE. Below are a few specific examples of set-ups around the state:

Franklin County has recently received County Board permission to move forward with a plan to provide an i3 compliant CPE throughout the County. Franklin County currently has three different i3 compliant, geo-diverse systems within the county with the plan to bring the Franklin County Sheriff's Office and Grove City PSAP onto the City of Columbus geo-diverse controllers. Delaware County is in discussions with Franklin County to host PSAPs that are diverse from the two existing County vendors. This plan could lead to a regionalization of several surrounding counties. Franklin has also been given permission for legislation to require the other non i3 compliant PSAPs within the County to join one of the three i3 compliant systems by 2018. At this time, Franklin County is moving forward with pricing for core services for the County, but has not decided to move forward with core services until the State decides on the State plan and determines a timeline for implementation.

Cuyahoga County has deployed an Emergency Call Works (ECW) i3 compliant CPE to the 34 PSAPs within the County. The system consists of two Geo-diverse controllers based in data centers located in Cleveland and Columbus using OARnet connectivity between the controllers and an ATT provided MPLS network connected from each controller to the PSAPs. The Cuyahoga County OARnet connection is not part of the ESInet Test Pilot and is not part of the Ohio 9-1-1 Program Office Plan or Operations. Cuyahoga County has strategically placed their controllers in data centers that include OARnet nodes for future possible connection to the State's core services. The ECW controllers provide call taking and mapping to each PSAP within the County.

Marion County has installed a hosted i3 compliant system from Frontier Communications. The system is comprised of two Geo-diverse controllers located within two diverse Frontier Central Offices. It is Frontier's plan to use these controllers for any PSAPs in Ohio selecting a Frontier NG9-1-1 system.

Hamilton County, in conjunction with the city of Cincinnati, has an i3 capable system provided by West/Intrado.

Morgan County is part of the State's ESINet Test Pilot and will be joined with at least 15 other counties in the near future.

2.4   Core Services

L.R. Kimball will develop an RFP to provide a statewide network and build the core services component of a statewide NG9-1-1 system. It is the State's position that the prospective vendors must provide a proposal to house the data centers in State-owned facilities (SOCC, others) and may propose alternative options for housing the data centers at their vendor-owned locations if they choose.

The State of Ohio should consider the core services that can be provided within the statewide ESInet. These are services that are generally provided to route and deliver calls. Core services provided within a statewide ESInet range in variety from state to state and are customized to meet the needs of each. Ohio has not yet decided what

core services or functions they will provide along with the ESInet backbone. This will be a decision based on cost and the needs of PSAPs across the State. Based on feedback collected from Ohio PSAPs, the following core services are important to the PSAP community to have available on the statewide ESInet:

Border Control Functions (BCF) – this function begins with a firewall to protect the statewide ESInet from malicious activity from the originating call providers at the point of ingress and from PSAPs, regional ESInets or other services with access to the statewide core services. Other border control functions may include verifying the call information configuration and/or translation among various call formats and protocols.

Emergency Services Routing Proxy (ESRP) – this is where the call information is processed and then subsequently delivered to the appropriate PSAP or regional ESInet. Included within this function:

> ➢ **Policy Routing Function and the Policy Store** – determines if the PSAP or Regional ESInet is available to receive the call or if alternate or special call routing is required.

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