

Report

on

Next Generation 9-1-1 Feasibility Study

prepared for

**The State of Michigan
9-1-1 Committee**

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1. EXECUTIVE SUMMARY

L. Robert Kimball & Associates, Inc. (L.R. Kimball) is pleased to provide the state of Michigan (“the state”) and the State 9-1-1 Committee (“Committee”) this Next Generation 9-1-1 (NG9-1-1) feasibility report.

1.1 PROJECT OVERVIEW

The state sought a comprehensive study of multiple options for a NG9-1-1 network to serve all of the state of Michigan. Changing and affordable new technologies have altered the way the public accesses 9-1-1. In some areas, wireless calls are well above 70 percent of all calls received by the local public safety answering point (PSAP). The Committee understands that the increasingly technical nature of these services requires an upgrade of the current 40-year old analog 9-1-1 system.

When wireless devices (cell phones) started accessing 9-1-1, the system was unable to provide any of the information that routinely accompanied a landline (legacy) call. There was no call back number or caller location information. The changes to the system that were required just to get the cell tower location and call back number were lengthy. Despite the challenges, all of Michigan’s counties have been capable of processing wireless Phase II calls since the end of 2005.

The Federal Communications Commission (FCC) through its seventh Network Reliability and Interoperability Council (NRIC VII) dedicated a subcommittee to look at the future of E9-1-1. The National Emergency Number Association (NENA) has spent time and effort working with PSAP managers and technology specialists to come up with the Next Generation 9-1-1 network. The federal Department of Transportation (DOT) brought in experts to conduct a proof of concept (POC) that demonstrated what could be done using upgraded internet protocol (IP) technology.

The common theme of all the above is that the 40-year old technology currently used for 9-1-1 cannot provide the backbone of a 9-1-1 system that is being asked to meet the expectations of consumers that use newer modes of communication that results from the realities of a more complex and mobile society. Examples include text message calls from hearing-impaired callers, data from an automatic crash notification device, residents three counties over whose 9-1-1 center had to evacuate due to a flood, or the caller whose baby is not breathing and whose call is queued behind 15-20 other callers reporting the accident on the freeway at rush hour. All of these issues can be addressed by changing out the old technology and moving to a robust and redundant, scalable IP-based backbone.

The vision of NG9-1-1 is twofold. From a technology perspective, it addresses all of the new communications devices by changing from an archaic analog system to a robust and dynamic digital technology. From a local control perspective, it provides more control over local data and allows for call routing to be done by policy. Policy routing provides the ability for PSAPs to decide how calls will be handled under certain conditions such as unforeseen evacuations and spikes in 9-1-1 call volume. These policies can virtually eliminate 9-1-1 busy signals or unanswered calls, yet giving PSAPs more control over the information they receive and how they process and share it. The basic premise of NG9-1-1 is that it does not change local control of local calls, but provides opportunities to provide service for any device, anywhere and at any time.

1.2 METHODOLOGY

L.R. Kimball has reviewed the status of PSAPs across Michigan. L.R. Kimball developed an electronic inventory using both a survey tool emailed to all PSAPs and visiting 16 sites of varying sizes and locations.

Three meetings with service providers were held to inform the industry about the study and to gather information about what IP services currently existed and where they were located. This aided in determining the status and availability of IP within Michigan.

1.3 FINDINGS

L.R. Kimball found that IP technology is available throughout Michigan. Some of Michigan's telephone companies have built fiber optic networks to support a variety of voice and data services. Michigan's cable television companies have a vast infrastructure serving homes and businesses throughout the state, including voice and data services. Some wireless networks also utilize IP. It is clear that it is possible for one or more of these existing IP networks to serve 9-1-1 across all of the state.

After identifying four options, L.R. Kimball analyzed the regulatory, policy and political implications; the operational and technical aspects, and costs for each option.

1.4 RECOMMENDATIONS

L.R. Kimball recommends the following two options for Michigan. The first option is more cost effective than the second option, but either would provide a phased-in transition from an IP 9-1-1 network to a fully functioning NG9-1-1 network.

- A Statewide Prime Contractor Managed IP Network
- A Regional Prime Contractor Managed IP Network

1.4.1 Statewide Prime Contractor Managed IP Network

A prime contractor would provide the communications infrastructure and NG9-1-1 applications to all PSAPs. The state would establish the service levels, and meeting them would be the responsibility of the prime contractor. The State of Michigan would be the customer of record for the contract, and would hold the prime contractor responsible for all issues. The prime contractor would be the single point of contact for the state for all issues with the delivery of NG9-1-1 calls and associated applications to each PSAP in the state. The prime contractor could be:

- A qualified carrier providing the IP transport network and the public safety solutions
- A qualified carrier providing the IP transport network and subcontracting the services of a public safety solution provider

- A public safety solution provider subcontracting IP transport network connectivity from a qualified carrier or carriers
- A systems integrator subcontracting IP transport, connectivity and solutions

The prime contractor would be responsible for all service levels associated with NG9-1-1 call delivery along with supplemental and supportive¹ information as specified in NENA documentation.

Statewide IP connectivity could be accomplished with services available by carriers currently operating in Michigan.

Newer public safety solutions providers (i.e., those that are not incumbent or competitive telephone companies) have the capability to provide the service by leasing the IP connectivity from a qualified carrier and providing the NG9-1-1 functions as a service based on number of calls delivered or population served.

1.4.2 Regional Prime Contractor Managed Network

A prime contractor would provide the IP transport infrastructure and public safety solution applications to all PSAPs within a geographic area, or a single prime contractor could contract and manage local carriers within regions. The prime contractor would be responsible for making sure required service levels are met within that region or the state could set required standards. The state of Michigan would hold the regional prime contractors responsible for all issues within their respective regions. Multiple providers could support this option.

L.R. Kimball recommended eight regions based on the current emergency management and homeland security districts in Michigan. Coordination of regional interconnections to create statewide IP connectivity would have to occur. This could be accomplished by the state, a third party, or by one of the regional prime contractors. Because this requires centralized coordination, we recommend this be done at the state level. Each of the regional prime contractors would provide a single point of contact for the state for all issues with the delivery of NG9-1-1 calls and associated applications within their respective geographical area. The prime contractor could be:

- A qualified carrier providing the IP transport network and the public safety solutions

¹ NENA Technical Information Document on Network to IP PSAP Interface, 08-501, June 2004, pages 2-19 – 2-21. The NENA Future Path Plan describes three types of information related to an emergency call that are either delivered with the emergency call or that can be made available to the PSAP either through a query/response method initiated by the PSAP or as initiated by the network or a third party. These sets of data include essential data, supportive data and supplemental data. Essential data are used to route the call and are delivered with the call. Supportive data are analogous to ALI data. They may be delivered with a call or requested by the PSAP during an ongoing call. Supplemental data are data that can assist the emergency responder(s) in preparing to respond to the emergency. These data may include, for example: medical records, motor vehicle records, vehicle collision information, etc.

- A qualified carrier providing the IP transport network and subcontracting the services of a public safety solution provider
- A public safety solution provider subcontracting IP transport network connectivity from a qualified carrier or carriers
- One or more system integrators subcontracting the IP transport backbone, connectivity and solutions

Statewide IP connectivity utilizing a regional design could be accomplished with services available through several regional carriers in Michigan.

L.R. Kimball believes that the challenges could be addressed successfully through an open process and united effort between all stakeholders in conjunction with the Committee and the 9-1-1 Office.

1.4.3 Regulations and Statutes

Michigan's ability to move forward will necessitate changes to state regulation and statute. The Legislature should act to eliminate statutory provisions that would prevent the deployment of a statewide ESInet or regional, interconnected ESInets capable of supporting NG9-1-1, and provide the Committee and/or the Office with the means to exercise effective authority in a NG9-1-1 environment. In L.R. Kimball's experience, the most successful state 9-1-1 programs are those that have broad powers and authority for the statewide provisioning of 9-1-1, have adequate funding and control over that funding, and function autonomously. The following list presents our key recommendations. Comprehensive recommendations are provided in section seven of this report.

- MCL 484.1102 – update and expand definitions to include Next Generation 9-1-1 features and functions.
- MCL 484.1201 – expand this section to include the state, thereby enabling the state to implement a statewide system and provide for the interconnection of regional systems.
- MCL 484.1712 – modify this section to change the committee from advisory to a fully empowered board or commission with broad authority and powers.
- MCL 484.1713 – reduce the size of the committee to nine members, and streamline its composition.
- MCL 484.1714 – give the reconstituted committee the broad authority and powers necessary to lead the transition to statewide NG9-1-1 and oversee its operation. This is essential if Michigan is to effectively meet the requirements of E9-1-1 and NG9-1-1. The changes recommended include:
 - Relocation of rulemaking authority from the MPSC to the state 9-1-1 Committee and/or Office
 - Authority to establish and enforce service standards
 - Authority to design and procure statewide NG9-1-1 system components and oversee their implementation and operation
 - Authority to manage or contract for the management of the interconnections between local, regional or interstate ESInets

- Tariffs – update the tariffs to reflect industry requirements for NG9-1-1 and eliminate any roadblocks to achieving statewide NG9-1-1.

1.5 CONCLUSION AND ACKNOWLEDGEMENTS

It is certain that Michigan is at a cross roads. The full benefits of NG9-1-1 will not be available to Michigan’s PSAPs or its citizens unless known and identified roadblocks are cleared away.

We would like to thank the Committee and 9-1-1 Office for their support throughout this study. We would also like to thank the industry representatives who took time to meet with us and provide information, as well as the many 9-1-1 service district representatives who responded to our survey, telephone calls and emails. It is our hope that this report will provide Michigan with a clear roadmap forward.

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2. INTRODUCTION

Michigan Compiled Laws (MCL) 484.1101–484.1717, also known as the Emergency Telephone Service Enabling Act (Act), governs the state of Michigan’s 9-1-1 service. The Act provides for the technical and managerial aspects of the state’s 9-1-1 system, funding mechanisms for the 9-1-1 network backbone and the 181 PSAPs’ capital and operating costs.

State-level oversight is provided by the Committee with the assistance of the State 9-1-1 Administrator’s Office (Office, or 9-1-1 Office). The Michigan State Police (MSP) is responsible, by statute, for providing staff assistance to the Committee as necessary to carry out the Committee’s duties and fulfills this responsibility through the 9-1-1 Office. The Committee has authority to recommend technical and operational standards for PSAPs, to recommend model 9-1-1 systems and to provide assistance for the design, implementation and operation of those systems. However, the Committee does not have rulemaking authority. Rather, that authority rests with the Michigan Public Service Commission (MPSC), in consultation with the Committee, for the following specific 9-1-1 matters:

- Uniform policies, procedures and protocols for 9-1-1 services in counties and PSAPs in the State
- Training standards for PSAP personnel
- Standards for the receipt and use of 9-1-1 funds
- Requirements for multi-line telephone systems

However, since NG9-1-1 is inherently different from the historic regulated telephone service, this opens an opportunity for the State to reconsider the locus of rulemaking to reflect the changing 9-1-1 environment.

Michigan has made tremendous progress in implementing both landline and wireless Enhanced 9-1-1 service (E9-1-1) statewide, according to the Committee’s 2009 Report to the Michigan Legislature. All 83 Michigan counties provide E9-1-1 for landline telephones and Phase II E9-1-1 for mobile/wireless telephones. Despite these advances in the level of 9-1-1 service, communication technologies (and consumer adoption of them) are advancing at an even faster rate than 9-1-1 can accommodate. A recent NENA publication summed up the issue this way:

Our nation’s 9-1-1 system is being pushed to the edge and is increasingly falling behind as technology in the hands of consumers rapidly advances past the capabilities of the current E9-1-1 system. Texts messaging and instant messaging are becoming a more common method of communication than the traditional two-way voice telephone call. Pictures and videos from phones and PDAs are being shared instantly with friends and colleagues around the world. Video and text based communications are replacing traditional TTY communications for the deaf and hard of hearing. Automobiles are being outfitted with telematics systems that automatically open up a voice call and provide valuable crash data when a car is involved in an accident. These are all amazing technologies, and citizens can reasonably expect to be able to contact 9-1-1 with technologies they use to communicate every day. Yet, all of these advancements in

consumer communications technology have one important characteristic in common: *today's legacy 9-1-1 system cannot deliver any of this information to 9-1-1 centers [emphasis added].*²

Several years ago, Dale Hatfield, former Federal Communications Commission (FCC) Office Chief, described today's 9-1-1 system as "...an analog technology in an overwhelmingly digital world."³ This is the reason today's E9-1-1 system cannot handle these new modes of communication and new types of information: the decades-old analog technology is simply too antiquated to do the job.

Understanding this, the Committee determined that it must study the feasibility of upgrading Michigan's current E9-1-1 system to modern, digital IP-based technology. An IP-based 9-1-1 system would provide a flexible backbone transport for 9-1-1 with the capability to encompass the existing landline and wireless voice and data, as well as Voice over Internet Protocol (VoIP), telematics, still image and video transmissions, text/data messaging and yet-future communications technologies.

Although development work regarding the technical architecture of NG9-1-1 is still underway, it is timely for the State of Michigan to focus on what it will take to move in that direction. The NG9-1-1 service model anticipates "a system with shared networks, databases and applications in which the communications costs of public safety agencies are shared amongst all participants in the NG9-1-1 system..."⁴ The United States Department of Transportation (US DOT) has stated that once implemented, NG9-1-1 will enable the following:

- The transfer of 9-1-1 calls between geographically dispersed PSAPs (and from PSAPs to remote public safety dispatch centers) if necessary
- Increased aggregation and sharing of data, resources, procedures and standards to improve emergency response
- Maximized public capital and operating cost savings for emergency communication services
- Increased coordination and partnerships within the emergency response community⁵

Next generation functions that enable the transferring of 9-1-1 calls, the sharing of data and resources, the maximizing of cost savings and the increased coordination and partnerships among the stakeholders involved require a coordinated and interconnected environment. This level of coordination and interconnection has not been necessary in the past, and with it comes new institutional and public policy challenges. Current policy—and its related regulation and legislation—reflects the origin of E9-1-1 as a regulated telephone company service where each PSAP or local 9-1-1 system stands alone and where there is little, if any, sharing of information and data beyond the bounds of the individual 9-1-1 system.

² NENA Next Generation Partner Program, "A Policy Maker Blueprint for Transition to the Next Generation 9-1-1 System: Issues and Recommendations for State and Federal Policy Makers to Enable NG9-1-1," September 2008, Page 2.

³ Hatfield, Dale N. "A Report on Technical and Operational Issues Impacting the Provision of Wireless Enhanced 911." October 2002, Page ii.

⁴ National Emergency Number Association Next Generation Partner Program, "Funding 9-1-1 into the Next Generation: An Overview of NG9-1-1 Funding Model Options for Consideration," March 2007, Page 3.

⁵ USDOT. "Next Generation 9-1-1 (NG9-1-1) System Initiative: Concept of Operations." April 2007, Page 12.

NG9-1-1 is more than just a swap of one technology (analog CAMA) for another (IP) within the existing telephone company model.

Any effort to change the way things are done may be met with concern among local 9-1-1 authorities and PSAPs that the State will take over their 9-1-1 service. That concern may get in the way of effective dialog. It will be necessary to help such critically important stakeholders more clearly understand that NG9-1-1 involves practical partnerships in ways that E9-1-1 did not. Local functions such as staffing, answering calls and dispatching will remain under local control. Functions associated with system interconnection, IP network management, data services and data rights, etc. simply must be managed at a higher level.⁶ It does not detract in any way from how Michigan's counties do what they do best: answer and respond to 9-1-1 calls. Traditional 9-1-1 service providers—the Local Exchange Carriers (LECs)—may be concerned that they will lose revenue. The states that have launched pilot projects in partnership with their LECs and PSAPs demonstrate the positive benefits of approaching the challenge collaboratively.

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⁶ NENA Next Generation Partner Program. "Next Generation 9-1-1: Responding to an Urgent Need for Change." February 2006, Page 9

3. METHODOLOGY

To perform this feasibility study, L.R. Kimball used a variety of ways to gather data, including face-to-face meetings, telephone, e-mail, and internet research on the State of Michigan and other relevant websites. L.R. Kimball developed survey forms and spreadsheets to facilitate gathering the raw data from the various sources. Basic information gathered for each PSAP provided insight as to the current 9-1-1 system.

Additional follow up telephone calls, and e-mail correspondence with network providers gained additional information on the 9-1-1 infrastructure in the state.

L.R. Kimball used common practices in the telecommunications field, as well as publications from national organizations such as National Emergency Number Association (NENA), the Association of Public-Safety Communications Officials (APCO), Network Reliability Interconnection Committee (NRIC), Alliance for Telecommunications Industry Solutions - Emergency Services Interconnection Forum (ATIS - ESIF), Internet Engineering Task Force (IETF), and the United States Department of Transportation (USDOT) to develop recommendations for the state.

3.1 PSAP ASSESSMENT

L.R. Kimball used several methods to conduct the PSAP assessment aspect of this report. We worked with the Committee staff and key state, county, municipal and industry stakeholders to gather information necessary for the study.

Some information was located on the Michigan State Police 9-1-1 website, including the 2008 and 2009 Reports to the Michigan Legislature from the Michigan Emergency Telephone Service Committee (ETSC).

In consultation with the Committee staff and drawing on the industry experience and expertise of its project team, L.R. Kimball developed a survey form to collect the necessary information from the PSAPs that we did not visit in person.

The state provided a list of PSAP types to visit and survey.

L.R. Kimball worked with the State to select specific PSAPs that would provide a cross section of 9-1-1 centers in Michigan and help identify migration issues that would exist at the PSAP level.

- The Detroit PSAP
- Two Oakland County PSAPs
- Two Wayne County PSAPs
- Two PSAPs serving populations of less than 50,000 citizens
- Two PSAPs serving more than 50,000 citizens, but less than 150,000
- Two PSAPs situated west of US 127 and north of I-96
- Two PSAPs in the Upper Peninsula
- Three PSAPs as mutually agreed upon

From this list, we identified specific PSAPs to visit. These on-site PSAP visits occurred from December 8, 2008 through December 12, 2008:

- Alpena County Central Dispatch
- Canton Township Department of Public Safety
- CCE Central Dispatch
- Clinton County Central Dispatch
- Eaton County Central Dispatch
- Grand Rapids Police Department
- Hillsdale County Central Dispatch
- Lake County 9-1-1 Central Dispatch
- Livingston County Central Dispatch
- Livonia Police Department
- Menominee County Central Dispatch
- Negaunee Regional Dispatch
- Oakland County Sheriff Department
- Troy Police Department
- Van Buren Central Dispatch Center
- Detroit Service District PSAP

L.R. Kimball conducted interviews and completed survey forms. Digital pictures of the PSAPs' equipment rooms were taken and provided to the Office. Following the on-site visits, L.R. Kimball revised and updated the survey form found in Appendix A and, with the approval of the Office, distributed it to the remaining 165 PSAPs on Monday, January 12, 2009. The completion date was set for Monday, January 26, with an extension to February 11, 2009. One hundred twenty-three of the 181 PSAPs in Michigan submitted survey forms. L.R. Kimball compiled the data from the surveys into a series of spreadsheets to facilitate analysis of the current 9-1-1 system and provide an understanding of what would need to be done to properly enhance the system.

This data gathering allowed for in-depth network research and identified PSAP needs for accessing data services. L.R. Kimball also drew upon the knowledge and experience gained through conducting other, similar NG9-1-1 projects for other clients.

3.2 TELECOMM PROVIDER MEETINGS

Between the afternoon of January 22, 2009 and the close of business on January 23, 2009, L.R. Kimball participated in three half-day face-to-face meetings with Michigan telecommunications providers, current 9-1-1 service providers, and potential 9-1-1 service providers along with other interested parties. These meetings were designed to inform the audience about the project and open the door for those attending to comment and share information on available services that they could provide. (See Appendix C)

L.R. Kimball obtained contact information from the parties in attendance, and then followed up with a questionnaire (See Appendix D) to gather network and other data necessary to develop options for the State of Michigan.

The questionnaire requested information such as what IP services could be provided and where; their interconnection agreements and affiliations with other companies; and their interest in supporting the State of Michigan with Next Generation IP 9-1-1.

L.R. Kimball held follow-up conference calls with some providers. Many companies provided written responses to the questionnaire that was distributed to all attendees.

3.3 NETWORK ASSESSMENT

The network assessment is based on data gathered from the PSAPs that participated in the survey, conversations with the current 9-1-1 service providers, and other telecommunications providers. Comments gathered through a questionnaire distributed to the attendees of the service provider meetings also added valuable information for the network assessment. From contacts made at the informational meetings, several conference calls were held to discuss network opportunities and interest in the Michigan IP-based network study. The meetings also provided contact information so a questionnaire could be distributed to gather network data and other data necessary to develop options available to the State of Michigan.

3.4 ANALYSIS

The basis for L.R. Kimball's analysis was the information obtained through onsite PSAP visits and PSAP surveys, the three informational meetings with network and 9-1-1 service providers, follow-up conference calls and correspondence with several of the providers. The providers' responses to the questionnaire were also considered.

Several emails were sent by the 9-1-1 Office attempting to get further information and compliance. The due date of the surveys was extended and L.R. Kimball offered phone and email assistance to the PSAPs. The unavailability of complete information required L.R. Kimball to average the data across the PSAPs and conduct the analysis on that basis. We are confident that this method provided a defensible overview of services and equipment in place.

The service provider questionnaires and communications provided insight into currently available IP networks in the state as well as interconnection options. We contacted several of the service providers directly to verify or clarify information they had provided regarding interconnectivity with other service providers and service levels. This enabled L.R. Kimball to analyze what infrastructure is currently available and how it could help advance the State of Michigan's efforts to modernize 9-1-1 services statewide.

As we developed the implementation options we would recommend for Michigan, our assessment included the factors of geography, population density variations, and existing emergency management service district boundaries.

L.R. Kimball's analysis also involved use of nationally accepted guidelines and best practices for Public Safety Communications and NG9-1-1, and drew heavily upon our staff's prior experience working with other state agencies within Michigan and their extensive professional knowledge of carrier connectivity options throughout the state.

4. FINDINGS

This section contains a straightforward presentation of what was found during the course of the study. The analysis of those findings and the recommendations resulting from analysis of these findings can be found in sections five and seven, respectively.

Michigan's current 9-1-1 systems are provided by AT&T and Verizon, using analog Time-Division Multiplexing (TDM)⁷ technologies. The legacy system has provided reliable service to date, but the public is rapidly adopting new communications products and services that cannot connect to Michigan's PSAPs over the old network. Technologies are available to enable Michigan to provide service to users of new communication technologies and services, and prepare Michigan to meet known future needs.

4.1 PSAP DATA

As noted earlier in this report, 123 of Michigan's 181 PSAPs (68 percent) submitted survey forms. The information available to L.R. Kimball and summarized in this section represents only those PSAPs who responded to the survey.

L.R. Kimball found that not all PSAPs are wireless Phase II compliant. The entire state of Michigan, however, does have wireless Phase II coverage. All wireless calls are routed to the nearest Phase II capable PSAP, which may not be the closest PSAP to the caller.

Phase I compliance provides the Master Street Address Guide (MSAG) valid address of the tower that is being used. Phase I also returns the caller phone number, the wireless service provider and class of service. Phase II compliant means that the actual coordinates of the caller's location (not the tower location) is delivered with the call, along with the caller's phone number and the confidence factor. Of the 123 PSAPs that submitted responses to the survey, eight specified that they are Phase II compliant. Four PSAPs specified that they are Phase I compliant only, and 32 PSAPs did not provide an answer.

Michigan's two 9-1-1 service providers are Verizon and AT&T. The two 9-1-1 database providers identified through the survey are Verizon and Intrado for the AT&T PSAPs. Below is a summarization of other data collected in the survey:

Of the 123 PSAPs that responded:

- 13 (10.5 percent) said they did not have enough positions in their PSAPs to operate properly
- Six (5 percent) do not have a mapping system
- 26 (21 percent) do have onsite ALI
- 107(87 percent) have call loggers

⁷ Newton's Telecom Dictionary, 16th Edition, defines TDM as, "A technique for transmitting a number of separate data, voice and/or video signals simultaneously over one communications medium..."

- 41 (33 percent) have time synchronization
- 106 (80 percent) have CAD systems

Telephone answering Customer Premise Equipment (CPE)

- 64 (74 percent) of the 86 PSAPs that provided CPE make and model information also provided the date of installation and/or date of CPE update
- 37 (58 percent) of the 64 PSAPs that provided CPE date of installation and/or date of CPE update had systems that were installed or updated before 2006
- 10 (12 percent) of the 86 PSAPs that provided CPE information identified using manufacture discontinued CPE equipment
- Five (6 percent) of the 86 PSAPs that responded with CPE information to the survey reported having an IP-capable CPE

We note for the record that 38 (31 percent) of the survey respondents did not know or did not provide information about CPE make and model.

Appendix B lists all PSAPs who responded to the survey, the CPE manufacturer and model they listed, along with the estimated date of installation and update (if provided).

Figure 1 below shows the breakdown of PSAP CPE by manufacturer as reported by the PSAPs.

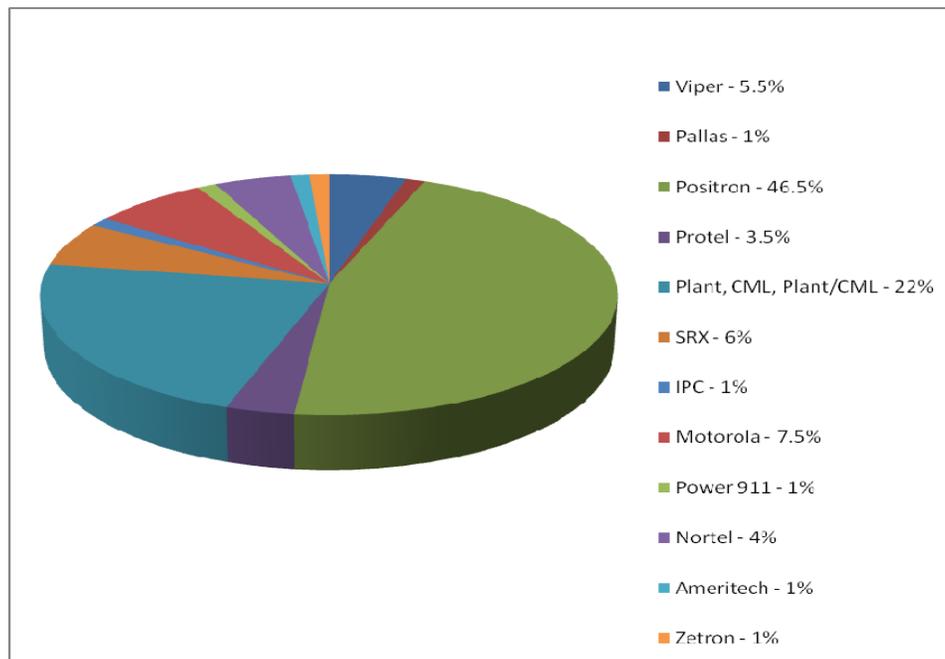


Figure 1- Breakdown of PSAP CPE by Manufacturer

4.2 NETWORK

4.2.1 Current 9-1-1 Networks

As we pointed out in the introduction to this section, Michigan's current 9-1-1 systems use older TDM network technology. The networks are comprised of Centralized Automatic Message Accounting (CAMA)⁸ trunks, analog Automatic Location Identification (ALI)⁹ data circuits, and several types of legacy selective routers. The current systems have proven to be reliable but are becoming obsolete.

The two 9-1-1 service providers, AT&T and Verizon utilize quite different system configurations in Michigan today. Verizon uses a host/remote ANI/ALI controller and workstation configuration. Host/remote means that multiple PSAPs share a common ANI/ALI controller and the PSAPs only have to purchase workstations. It is a cost-effective solution that reduces the amount of hardware and software a PSAP would have to purchase. Verizon is in the process of incorporating new selective routers into their network. The current selective routers are nearing capacity as a result of new providers, such as wireless, that need access to the 9-1-1 systems. Verizon uses ECS1000s as combination selective routers and ANI/ALI controllers. Verizon is moving the selective router function from the ECS1000s to two existing telephony tandems, a 5ESS and a DMS100, currently in their network. The ECS1000s will remain as hosted ANI/ALI controllers. This change will allow for more trunking capacity and is planned to provide some diversity in the network following NRIC recommendations. Verizon's ALI service is migrating from an on-site platform to a hosted solution. AT&T's network currently utilizes their telephony tandems for 9-1-1 selective routing and delivers CAMA trunks to all onsite ANI/ALI controllers. Their 9-1-1 tandems/selective routers are located throughout the state including the UP. They are not configured as mated or paired so there is no redundancy in their configuration.

None of the PSAPs that responded to the survey indicated any direct trunking arrangements from either of the 9-1-1 service providers.

Diversity and redundancy are both lacking in the current 9-1-1 system design. Today there is also no interoperability between these selective routers. The vastly different configurations between the two current 9-1-1 providers, AT&T and Verizon, create distinctly different challenges in delivering IP network transport to the PSAPs.

⁸ Newton's Telecom Dictionary, 16th Edition, defines CAMA as a version "of AMA in which the ticketing of toll calls is done automatically at a central location for several Central Offices..."

⁹ Newton's Telecom Dictionary, 16th Edition, defines ALI as, "Working with Automatic Number Identification, the use of a database to associate a physical location with a telephone number. ALI is a feature of E-911 (Enhanced 911) systems. ALI is provided to agents answering E-911 calls. It may include information such as name, phone number, address, nearest cross street and special pre-existing conditions, (e.g., hazardous materials). On some systems it may also provide the appropriate emergency service address for the particular address. ALI is retrieved from a computer database. The database may be held on site or at a remote location and may be maintained by the local phone company (or its parent) or another agency."

4.2.2 Potential IP 9-1-1 Networks

In response to the questionnaire, we received information from AT&T, Verizon, VIXXI, Intrado, CenturyTel, OnStar, Intrado, TCS, UPTTEL, Peninsula Fiber Networks, INDigital, and the State of Michigan Department of Information Technology (MDIT).

OnStar does not offer a network solution. UPTTEL expressed interest in Michigan's project but needed more information before it could respond. The remaining respondents indicated they would be able to provide statewide or regional IP-based 9-1-1 services. The respondents who were also network providers could offer several options for an IP enabled statewide 9-1-1 network solution.

All the network vendors offered basic telecom services such as point-to-point DS-1 and DS-3 circuits, which could be utilized in creation of an IP enabled network. Most of the vendors also provide advanced IP services such as MPLS or point-to-point Ethernet services, which could be used to interconnect PSAPs in the state.

IP-based networks serving the business sector exist throughout the State of Michigan today. AT&T and Verizon have interconnection agreements with each other and can provide IP services across the state of Michigan. There are also several competitive local exchange carriers (CLECs) and Local Exchange Carriers (LECs) that can resell the services provided by AT&T and Verizon, or in some cases they can provide their own infrastructure and connections. Several of these other carriers have built extensive fiber optic networks and can purchase services from the LECs to provide connections.

The Michigan Department of Information Technology (MDIT) has a contract in place with AT&T to provide IP services to state agencies across Michigan. This AT&T monitored and managed Multi-protocol Label Switching (MPLS)¹⁰ IP network is statewide, redundant, and available to all State of Michigan agencies. AT&T uses interconnection agreements with the local exchange carriers to provide MPLS services anywhere in the state that may be outside of the AT&T service area. The MDIT contract negotiated with AT&T was developed to provide services to state agencies and was not intended to deliver the stringent service levels required for 9-1-1 services. Bandwidth requirements for 9-1-1 along with service level agreements that support the needs of 9-1-1 would need to be evaluated to ensure the MDIT network would fully support the current and future requirements for 9-1-1. Amendments to the MDIT contract with AT&T would likely be required.

A statewide IP-enabled network with diversity and redundancy could be created today. Many of Michigan's providers currently offer IP transport. Developing service level agreements (SLAs) that will meet the very high availability for 9-1-1 may result in some of these providers not being willing to participate. An IP network would pave the way for the State of Michigan to migrate to an Emergency Services IP network (ESInet)¹¹ and ultimately NG9-1-1. (See Section 4.3.4 for a more complete discussion of ESInet)

¹⁰ Newton's Telecom Dictionary, 16th Edition, defines MPLS as, "An evolving IETF standard intended for Internet application...MPLS is a widely supported method of speeding up IP-based data communication over ATM [Asynchronous Transfer Mode] networks."

¹¹ NENA Master Glossary of 9-1-1 Terminology, NENA 00-001, Version 12, July 15, 2009. ESInet: An IP-based inter-network (network of networks) shared by all agencies which may be involved in any emergency.

4.3 POLICY

The policy information contained in this report is derived from an earlier report L.R. Kimball prepared for the Michigan State Police entitled, "Initial NG9-1-1 Policy Analysis Report."

4.3.1 General Policy Findings

Michigan is facing the same policy issues being faced by every other state. The National Emergency Number Association's Next Generation Partner Program has identified those issues as follows:

- State-level 9-1-1 leadership and coordination
- Funding
- Establishing statewide emergency services IP networks (ESInets)
- Legacy regulation/legislation and tariffs
- Automatic location of 9-1-1 calls
- Confidentiality
- Liability

The most important priorities for Michigan are the first four, (1) State-level 9-1-1 leadership and coordination, (2) Funding, (3) Establishing statewide emergency services IP networks (ESInets), and (4) Legacy regulation/legislations and tariffs. These are interrelated and must be addressed first to prepare the way for NG9-1-1. The others are also important, but not immediately so. Michigan can address these other issues as NG9-1-1 starts to become a reality.

There is a distinction between IP-enabled 9-1-1 and NG9-1-1. A more detailed analysis of what this means for Michigan is provided in Section 5, Analysis.

4.3.2 Statutory Provisions for State-level 9-1-1 Leadership and Coordination

The Introduction section of this report outlines the statutory provisions governing 9-1-1 in the State of Michigan. We provide a brief review here. The statute, Michigan Compiled Laws (MCL) 484.1101–484.1717, is commonly known as the Emergency Telephone Service Enabling Act (Act).

The Committee, with the assistance of the Office, provides state-level oversight. The Committee's statutory authority is purely advisory. It may develop and recommend statewide standards for emergency telephone service, make recommendations for counties' 9-1-1 plans, provide technical assistance for the implementation of county 9-1-1 systems and oversee the distribution and use of State and county 9-1-1 funds. The Committee does not have rulemaking authority through the MSP, which is where the Office is housed. It may make recommendations to the Michigan Public Service Commission (MPSC), which has authority to promulgate rules in consultation with the Committee.

The Committee has recommended training and MLTS standards to the MPSC. The MPSC recently initiated an informal comment period on the Committee's recommended MLTS standards.

4.3.3 Current E9-1-1 Funding Mechanisms

In December 2007, the Michigan Legislature significantly changed the funding mechanisms for 9-1-1. On July 1, 2008 the former state-level wireless 9-1-1 surcharge became an “all device” surcharge. The counties’ landline 9-1-1 surcharge was likewise changed to an “all device” surcharge.

“All devices” is intended to require all communications services that can provide access to 9-1-1 to collect and remit the 9-1-1 surcharge, regardless of technology. Michigan currently has these three statutory funding provisions for 9-1-1: (1) the State “all devices” surcharge, (2) the county “all devices” surcharge, and (3) the Technical Charge fee (which is wireline based).

4.3.3.1 State 9-1-1 Surcharge

Michigan’s State 9-1-1 surcharge is collected by the communication service providers and remitted to the Michigan Department of Treasury (Treasury); a separate fee on pre-paid wireless services is also remitted to the Treasury. The Treasury is responsible for the financial administration of the state’s 9-1-1 program. This includes processing remittances from the communications service providers, depositing them into the Emergency 9-1-1 Fund; distributing the funds to the counties, Local Exchange Carriers (LECs) with MPSC approval and the PSAPs (for the training fund) as directed by the Committee; and accounting for all transactions from the 9-1-1 Fund.

The State’s 9-1-1 current surcharge is \$0.19 on all communications devices and is distributed as follows.

- 82.5 percent to counties distributed in two manners: 40 percent on an equal share basis and 60 percent on a per capita basis
- 7.75 percent to fund 9-1-1 network costs for delivery of wireless calls to PSAPs
- 6.0 percent to 9-1-1 training program
- 1.87 percent to administer the Act and fund Office
- 1.88 percent to the Michigan State Police (MSP) to operate a regional dispatch center that receives and dispatches 9-1-1 calls

4.3.3.2 County 9-1-1 Surcharge

The county surcharge is assessed, collected and remitted directly to the county and administered by the county according to the provisions of Public Act 32 of 1986, as amended. Sixty-six counties collect a local 9-1-1 surcharge. The remaining counties fund 9-1-1 operations through general funds or millages.¹² County 9-1-1 surcharge rates approved under MPSC Docket U 15489 have been grandfathered under Public Act 379 of 2008. County commissioners can approve rates up to \$0.42 without voter approval and can assess up to \$3.00 with voter approval.

¹² A tax rate on property, expressed in mills per dollar of value of the property.

4.3.3.3 Current Revenues and Costs

Total reported¹³ County revenues for the fiscal year ending June 30, 2008 were \$190,623,646. Total reported County 9-1-1 operating budgets for the same period were \$203,502,587. Revenues reported¹⁴ for the fiscal year ending June 30, 2009 were \$218,076,796, and County 9-1-1 operating budgets for the same period were \$200,431,536.

Year	Aggregate Revenue	Total Budget	Difference: Revenue - Budget
2007-8	\$190,623,646	\$203,502,587	(\$12,878,941)
2008-9	\$218,076,796	\$200,431,536	\$17,645,260

Table 1 – Current Revenue & Costs

County 9-1-1 revenues may be used for the following purposes:

- Personnel Costs directly attributable to the delivery of 9-1-1 service
- Facility Costs of the dispatch center directly attributable to the delivery of 9-1-1 service
- Training and Memberships directly related to 9-1-1 service
- Hardware, software, training and peripherals directly attributable to the delivery of 9-1-1 service
- Vehicle costs directly attributable to the delivery of 9-1-1 service
- Professional Services
- Public Education/Information Expenses

A complete list of allowable and disallowable expenses may be found at http://www.michigan.gov/msp/0,1607,7-123-1593_47748_47753---,00.html.

4.3.3.4 Technical Charge

Michigan’s technical charge is unique; to our knowledge, no other state has anything like it. The technical charge is based on two fundamental concepts. First, it provides a mechanism for the service providers to recover the cost of providing service. The cost of providing service for incumbent local exchange carriers (ILECs) is based on approved tariffs on file with the Public Service Commission. Other providers such as competitive local exchange carriers (CLECs) determine their costs directly. Second, within any given 9-1-1 district, the rate must be uniform for all end users. As a result of these two concepts, along with the requirement for geographic billing by service district, a pooling arrangement was instituted to minimize the required settlement process between the service providers and end users. A separate pool is maintained for each of the 79 service districts in the State of Michigan.

¹³ Michigan Emergency Telephone Service Committee’s 2008 Report to the Legislature

¹⁴ From materials being prepared for the Committee’s 2009 Report to the Legislature while this report was being compiled

The carriers that participate in the pool report their cost data to a CPA firm hired by the participants to administer the pools and settlement process. Each quarter, the carriers report their actual revenues, and if applicable, any cost adjustments. The CPA firm reconciles the cost and revenue data. If a carrier has over collected, it remits the difference to the pool; if a carrier has under collected, the pool remits the difference to the carrier. The pool uses the funds remitted due to over collection to reimburse any carriers whose costs are greater than what they collected. At the end of each year, the CPA firm determines what adjustments are needed to the rates to eliminate the over or under collections. These adjustments are communicated to the service providers and to the MPSC, which maintains a web page of all the various 9-1-1 surcharges.

In describing how the technical charge arrangement works, the CPE firm that manages the pools told L.R. Kimball that it benefits the 9-1-1 districts and provides cost reimbursement to the carriers. First, it enables carriers with small subscriber bases in a particular service district to recover mandated service costs. Second, it provides flexibility to service districts to design their 9-1-1 system to fit local needs. For example, some service districts operate consolidated 9-1-1 PSAP and dispatching functions in a single communication center; others operate a Primary and Secondary PSAP. The technical charge arrangement enables their unique costs to be covered without subsidy from other districts or end users.

Only three of Michigan's counties have a direct service contract with a 9-1-1 service provider. The majority of counties never see an invoice because the 9-1-1 service providers and local exchange carriers recover their costs through the technical charge. There is no statutory requirement for the incumbent and competitive LECs to report how much they collect from the technical charge to the State or how much it actually costs them to provide E9-1-1 service. There is a statutory requirement at MCL 484.1412a for the LECs to provide an annual accounting to the 9-1-1 service district for the total emergency telephone technical charges collected during the preceding calendar year. The state recently requested this information from the counties.

4.3.3.5 Transition Considerations

Regardless of which of L.R. Kimball's recommendation the State prefers, the transition period will involve operating the current systems and the new IP based system or systems in parallel for a time.

4.3.4 Establishing statewide emergency services IP networks (ESInets)

ESInets are essential to the NG9-1-1 and next generation emergency communications architecture. ESInets are IP-based, multi-purpose interconnected networks (network of networks) supporting local, regional, state and national public safety communications services in addition to 9-1-1. They provide the physical backbone and may host the application layer¹⁵ services that support interoperability among diverse regional/local networks and agency applications.

¹⁵ The "application layer" is the seventh of the seven layers of a computer network model defined in the Open Systems Interconnection Basic Reference Model (OSI Reference Model or OSI Model). The OSI Model is the only internationally accepted framework of standards for communication between different systems made by different vendors. The goal of the International Standards Organization, which developed OSI, was to create an open systems networking environment where any vendor's computer system, connected to any network, can freely share data with

These include, for example, standardized core services such as GIS-based directories of authorized organizations and resources, and access control/identity management for implementation of information-sharing policies. ESInets would enable all authorized organizations to share information based on their own data-sharing policies.

The Office, in conjunction with the Committee, provides the framework for the statewide coordination that is essential to establishing and managing ESInets. The NENA Next Generation Partner Program (NGPP) policy brief entitled, “Establishing State-Wide Emergency Services IP Networks (ESInets)” explains why the state’s involvement is important:

...ESInets...deployed at a sub-state level (regional/county)...must then be interconnected with other sub-state ESInets to establish a standardized, interconnected and interoperable state-wide ESInet...A state level entity or organization is recommended to implement and manage the interconnected state-wide ESInet (comprised of the interconnected regional/local IP networks or a single state network). A state level entity or organization can play a significant role by providing an IP backbone network to make interconnection of regional/local ESInets more efficient.¹⁶

Whether the State of Michigan provides a single, statewide ESInet or simply manages the interconnections between numerous local or regional ESInets, the Committee and/or the Office must first have the authority to make it happen.

4.3.5 Legacy Regulation/Legislation and Tariffs

IP networks for 9-1-1 open the way for new 9-1-1 service suppliers and other competitive options. This involves new technologies and business arrangements that current laws, regulations and tariffs did not foresee.¹⁷ As previously stated, Michigan’s 9-1-1 statutes, regulations and tariffs are designed around the traditional regulated telephone service approach to providing E9-1-1. Among the most important examples identified are:

- MCL 484.1102 (a) and (b) – definitions
- MCL 484.1201 – authorizes the implementation of E9-1-1 service only by counties
- MCL 484.1205 – provides that a 9-1-1 system shall process all 9-1-1 calls from “telephones” and does not provide for 9-1-1 calls from other types of devices

any other computer system on that network or a linked network. OSI was developed by the International Standards Organization. See Newton’s Telecom Dictionary, 16th Edition, 2000.

¹⁶ NENA Next Generation Partner Program. “A Policy Maker Blueprint for Transition to the Next Generation 9-1-1 System: Issues and Recommendations for State and Federal Policy Makers to Enable NG9-1-1.” September 2008, Page 8-9. A L.R. Kimball employee co-chairs the NENA NGPP committee of industry experts that developed this policy brief.

¹⁷ Ibid, Page 10.

- MCL 484.1401 – authorizes only “service suppliers” as defined to collect an emergency telephone technical charge to cover their costs to provide or interconnect with E9-1-1 system components
- MCL 484.1413 – places responsibility for rulemaking with the MPSC
- MCL 484.1712 – establishes the state 9-1-1 committee
- MCL 484.1713 – prescribes the membership of the committee
- MCL 484.1714 – establishes the committee’s duties

Michigan’s 9-1-1 service suppliers’ tariffs include definitions that describe E9-1-1 system components and functions in terms of legacy technology such as CAMA trunks. It does not provide for IP technologies.

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5. ANALYSIS

5.1 PSAP

The data collected from the PSAP surveys indicated there is a wide range of manufacturers and ages of 9-1-1 CPE. Some PSAPs are still using Motorola CPE that is manufacture discontinued. All of these systems can be interfaced to an IP-based network by using a legacy gateway. A legacy gateway is used to convert the IP based calls to a TDM signaling that the legacy PSAP CPE can use.

IP-based networks provide a flexible high-speed connection with the ability to transport video and other high bandwidth applications to the PSAP. An IP-based network is the basic building block for NG9-1-1.

As the IP-based network migrates towards an ESInet and more Next Generation applications (such as texting and video) become available, most of the 9-1-1 CPE will need to be replaced while others will need upgrading to enable them to utilize the new features and applications. Manufacture discontinued CPE should be replaced.

NENA describes the benefits to PSAPs of IP-based systems as follows:

IP-based 9-1-1 systems offer more opportunities to share infrastructure, work load, and call related data throughout the 9-1-1 and other public safety networks. IP-based systems allow PSAPs to work together cooperatively in ways that the current systems do not allow. IP-based systems will allow PSAPs to receive call-related data from multiple data sources such as telematics service providers, wireless carriers, or Internet based telecommunications service providers, rather than being restricted to access to a single database (ALI) as in the current 9-1-1 system. IP-based systems will support more communications alternatives for the hearing impaired or disabled community (i.e. text messaging, video relay services, etc.)¹⁸

Depending upon the IP-based network design and the existence of internetworking and agreements between PSAPs, centralizing and sharing of ancillary systems like CAD, mapping and call logging could be realized. Many of the current ancillary systems in use today will not support Next Generation applications and will need to be addressed as the Michigan 9-1-1 system evolves to a Next Generation 9-1-1 system.

5.2 TRANSPORT NETWORK

CenturyTel, AT&T, Verizon, Peninsula Fiber Networks and UPTTEL all responded that they had IP transport facilities and contractual agreements with other carriers to support an IP-based network for 9-1-1. The following table outlines some of the information these providers supplied on the survey.

¹⁸ NENA58-001, "IP-Capable PSAP Minimum Operational Requirements Standards Document", revised June 9, 2007 section 2.3, Benefits, Page 6.

Carrier Name	Type of IP Services	Interconnection Agreements	Can you support IP to all PSAPs?
AT&T	MPLS	YES	YES
Verizon	MPLS	YES	YES
MDIT	MPLS "lite"	By AT&T	YES
UPTTEL	Unknown	few wireless	YES
CenturyTel	MPLS	In their footprint	YES
Peninsula Fiber Network	GigE	In their footprint	unknown

Table 2 – Information Supplied by Vendors

The MDIT network is a statewide, redundant managed IP network with available bandwidth provided by AT&T. Network monitoring is provided by AT&T, and help desk and ordering of services is provided by MDIT. Bandwidth requirements for 9-1-1 along with service level agreements would need to be evaluated to ensure the network will fully support the requirements for 9-1-1. This network could provide IP connectivity for 9-1-1 across the State of Michigan.

The PSAP survey data identified the type of network that is in use today serving the PSAPs in Michigan. The PSAPs that have onsite ANI/ALI controllers are served by CAMA trunks and the Verizon PSAPs that are served by the host/remote configuration are served by voice and data circuits. Neither of the current network connections will support the features NENA describes for NG9-1-1 in its TID entitled “Functional and Interface Standards for Next Generation 9-1-1” Version 1.0.¹⁹ The Technical Description section identifies the need for an IP based system to support the identified NG9-1-1 features.

NENA recognizes and recommends that traditional 9-1-1 networks will need to be replaced with IP-based networks to enable PSAPs the ability to handle current and future needs from telecommunications providers, the public and support systems.

5.3 GENERAL TECHNICAL REQUIREMENTS FOR AN IP-BASED 9-1-1 NETWORK

These general technical requirements apply to all four options described in Section 6. As previously stated, an IP enabled network is a transport mechanism for an ESInet and ultimately the NG9-1-1 system.

Michigan has requested a network based on Next Generation 9-1-1 standards. This network is the transport network between the public and the PSAPs. The recent USDOT NG9-1-1 project included a

¹⁹ NENA 08-002, December 18, 2007, Section 3.

Proof of Concept component, which demonstrated a viable approach to implementation of a Next Generation 9-1-1 network.

That project outlined integration of an IP communications transport network and associated applications required to establish a Next Generation 9-1-1 system. The State of Michigan will require its IP network infrastructure design to accommodate the same applications infrastructure as described in the USDOT NG-9-1-1 proof of concept. More information is available at <http://www.its.dot.gov/ng911/index.htm>.

5.3.1 Functional Requirements

The minimum functional elements that should apply in the Michigan IP-Based 9-1-1 Network include:

- Call Access
- Call Routing
- Call termination

These functions reflect the minimum requirements for an IP-based 9-1-1 network. The solution must support commonly used IP-based telecommunications, messaging, image, and video protocols in order to maintain interoperability with IP applications.

5.3.1.1 Call Access

Call access includes the following functions:

- Border control
- IP routing
- Packet prioritization
- SIP conversion
- Firewall capabilities (Demilitarized Zone (DMZ), Network Address Translation (NAT),
- Session management
- Legacy gateway

Border control functions interconnecting with other IP networks will require equipment and standards be implemented. Security of independent IP networks will need to be maintained while interoperability for information transfer is available. Interfaces should be scalable to accommodate interconnections with other IP networks or ESInets across state lines or across the country. Security policies are established, but continue to evolve. Interconnecting agencies will have to adhere to both established standards and those that evolve subsequently. The standards should be based on NENA documents, local regulations, and industry best practices.

Security between the IP networks will be required with firewalls and a public key infrastructure (PKI) to maintain identities of entities allowed access to information. Internally, in each IP networks encryption, technologies may be implemented between interconnected agencies to keep data secure. When attaching to external IP networks or ESInets and other agencies, an authorization matrix must be developed to maintain data confidentiality. Interconnection between in-state agencies will have a different set of security criteria than interconnections between agencies located outside the state boundaries. Global policies on the equipment will vary between in-state agencies and out-of-state agencies. Interconnections

between in state and out-of-state IP networks could also supply redundancy from a logical and physical perspective.

The Legacy Gateway is not a part of the NG9-1-1 system, but is included in the architecture of the IP network because session initiation protocol (SIP) conversion is necessary with the realization that legacy systems of various types will remain in place for some time during the transition to a full NG9-1-1 system. The legacy gateway is used to take legacy systems such as the traditional phone system or the traditional telephony provider end office that delivers 9-1-1 calls using CAMA or SS7 signaling and convert it to a format that can be used when interfaced to the IP networks. Over time, fewer of the traditional systems will remain, and the need for legacy gateways will diminish. The NENA IP-capable PSAP Minimum Operational Requirements Standard 58-001 describes the IP PSAP Database Interface and the IP PSAP Network Interface in detail.

Michigan's IP network design should provide for the interconnection of all PSAPs in the state. Since the network is IP-based, such interconnections would allow any agency to communicate with any other agency or service on any of the interconnected IP networks. The IP-enabled PSAP is a PSAP that is capable of receiving IP-based SIP signaling and media for delivery of emergency calls.

5.3.1.2 Call Routing

The Call Routing function, known as "Emergency Call Routing Functions" (ECRF) in NG9-1-1 includes several services to route the call for service to the proper location. These include:

- Local level Location to Service Translation (Local LoST)
- Location Query Function (LQF) - Uses a dereferencing protocol (SIP or HTTP) to exchange a location reference or location information
- Routing Query Function (RQF) - Uses the LoST protocol to find a tentative list of next hops given the location information
- Policy Routing Function (PRF) - Uses the policy of the destination PSAP, PSAP state, congestion state, time of day, etc to determine the next hop that will receive the call.
- Location Validation Function (LVF) - This is a recommended function which is a storage location that holds all of the various local location databases. This centrally stored database allows the various users to have a single location to access location information for populating Location Information Server (LIS) or the LoST servers
- Business Rules
- Supportive Data

The Emergency Call Routing Function (ECRF) is one of the major functions that make NG9-1-1 different from the current systems. The ECRF is an advanced system for routing calls for service to the best location to handle the call. This also involves several other systems outside of the ECRF for data.

An Emergency Service Routing Proxy (ESRP) performs call routing. There may be several of these within the network to properly deliver calls to the proper location and for redundancy. The ESRP will make use of the location information stored in the Location to Service Translation (LoST) database to determine the route to the proper PSAPs.

This also involves a new function called policy-based routing function (PRF). This uses policies of the destination PSAP and the ESInet owner to route calls. This routing can be based on the PSAP state (e.g., in-service, busy), congestion state, time of day, or other new data provided with the call for service such as video or language preference. This function can also use supportive information to make routing decisions.

The Location Validation Function (LVF) will replace several systems in use today such as the Master Street Address Guide (MSAG). This is basically a Geographic Information System (GIS) with various sets of data related to the provision of 9-1-1 service in the area. This information can be used to route calls by the ESRP or to verify data to the service providers. The function must be able to look up information based on geographic or civic information provided directly.

A component of the ECRF and LVF function is the LoST database. The LoST database stores location information in a GIS format and is used to translate a location, both geographic and civic, to the proper response agency and PSAP. The location information, which is similar to the MSAG data used today, will be managed and structured differently in NG9-1-1. The data will appear as GIS layers associated with the LoST database. As a result of this association, the location information and related physical database is not accessed directly by NG9-1-1 functions, but is needed to set up address validation and routing relationships.

Other services may be needed for new technologies as they are deployed on the ESInet. The NG9-1-1 services provide the functionality for the system. These services will change as new services are developed and added to the ESInets.

The functionalities identified in this section are still in development. Some NG9-1-1 functionalities are incorporated onto vendors' solutions with further development required as standards evolve. The standards organizations are still working on these standards and practices with no final dates established.

5.3.1.3 Call Termination

The Call Termination function includes:

- PSAP ACD (incorporating transfer and call bridge capabilities)
- Business rules (same database used by ESRP)
- Call record database
- Supplemental data access
- PSAP workstations

The methods vendors use to implement these functions differ. New features will appear as new standards are implemented.

5.3.2 Technical and Performance Requirements

The network provider should comply with and be familiar with applicable NG9-1-1 recommended technical standards and documents from the organizations listed, and track new standards under development.

- National Emergency Number Association (NENA)
- US Department of Transportation NG9-1-1 Initiative
- Network Reliability and Interoperability Council (NRIC)
- Internet Engineering Task Force (IETF)
- Emergency Services Interconnection Forum (ESIF)

The technical and performance requirements at a minimum should include:

- Service Level Agreements (SLA)
- Network Management
- Redundancy and Diversity
- Network Scalability and Evolution of the System
- PSAP CPE capabilities

These elements only address the minimum requirements in a broad-based manner for an IP-based 9-1-1 network. The solution must support commonly used IP-based telecommunications, messaging, image, and video protocols in order to maintain interoperability with IP applications.

5.3.3 Service Level Agreements

Service Level Agreements (SLAs) are an important consideration for an IP-based 9-1-1 network. SLAs are contractual language that clearly states the parameters that the vendor must follow in the delivery of the contracted service. For example, a SLA could include the required level of service to provide 24/7 service, redundancy to assure that all calls get through to an answering point, etc. SLAs define the service level expectations from the prime contractor with monetary sanctions for noncompliance. SLAs should cover installation, performance and maintenance expectations. SLAs for an IP-based 9-1-1 network will have stronger requirements than normal telephony voice and data SLAs. The prime contractor should have SLAs with all of its subcontractors and partners that at a minimum are equal to the SLAs with the State.

Service levels would also be required of servers connected to the network. Servers should be located in secure facilities meeting guidelines defined by NRIC VII and other public safety best practices. Servers should be redundant and configured in a manner that no single outage will affect system performance.

SLAs are the most important part of the contracting process. SLAs should be properly reviewed and crafted to provide the required functions as needed by the 9-1-1 providers. Each device, service, or system should have SLAs in place with financial penalties to the vendor for instances that do not meet the required level of service.

5.3.4 Network Management

Network Management of an IP-based 9-1-1 network is crucial in providing the level of service expected by the residents and PSAPs in Michigan. It is a requirement to support an uptime of 99.999 percent availability, or better, on the IP network utilized for emergency service applications. The monitoring of the network and associated reporting must encompass the areas listed below and detailed in Appendix F.

- Performance Management
- Configuration Management
- Configuration Restoration
- Fault Management
- Root Cause Analysis (RCA)
- Security Management
- Physical Security
- Scheduled/Preventative Maintenance
- Network security management

The prime contractor must provide a method for repair logging, reporting and tracking. The repair logging should track system problems or errors and problem resolution timelines.

5.3.5 Redundancy and Diversity

The prime contractor should provide a disaster recovery plan for the IP-based network to support a network service interruption. The IP network design must support routing of 9-1-1 traffic to alternate PSAPs and/or utilize alternate media such as PSTN, wireless or public Internet services.

All critical components of the system should have redundancy designed into the system. This redundancy should be geographically diverse. The entire network including the servers and databases are encompassed in this requirement; there should not be a separate service level for applications and network elements.

5.3.6 Network Scalability and Evolution of System

An IP-based IP network should maintain the 9-1-1 system's capability to respond to new communication technologies and take advantage of additional new technology that may benefit the system operations.

An IP network must be designed to maintain different Quality of Service (QoS)²⁰ schemes to accommodate all current types of E9-1-1 calls and should accommodate future forms of emergency calling. These future forms may include, but are not limited to, the following:

- Short Message Service (SMS)²¹
- Instant Messaging (IM)
- Text messaging

²⁰ Quality of Service "is a measure of the telephone service quality provided to a subscriber." In digital networking, the term is used to refer to what is needed "in order to deploy real-time applications over IP networks with an acceptable level of quality, certain bandwidth, latency, and jitter requirements must be guaranteed, and must be met in a fashion that allows multimedia traffic to coexist with traditional data traffic on the same network." See Newton's Telecom Dictionary, 16th Edition, 2000.

²¹SMS, Short Message Service, is a means by which short messages can be sent to and from digital cell phones, pagers and other handheld wireless devices. See Newton's Telecom Dictionary, 16th Edition, 2000.

- Satellite Personal Locator Beacons²²
- Future development in TTY/TDD²³ devices

While it is not likely to be able to design a system that anticipates every possibility, a system architecture that is modular and based on standards will be better prepared to interface to new technologies.

5.3.6.1 PSAP CPE

Completing the migration to a true NG9-1-1 system requires consideration to be given to PSAP CPE. Most of the CPE in Michigan's PSAPs today is not IP-capable. Michigan's PSAP CPE and ancillary systems will need to be replaced or upgraded in most cases to realize the advanced functionality of a NG9-1-1 system. Compatibility and interoperability between PSAP equipment is paramount when planning a NG9-1-1 system.²⁴ Legacy CPE would require a gateway device to connect to the IP network, but would not provide the PSAPs with the full features of NG9-1-1.

5.3.7 General Operational Considerations

These general operational considerations apply to all four options. The operation of an IP enabled 9-1-1 system must have an operational structure that will support it. This structure will include:

- Governance
- Operational Management
- Training
- Staffing

5.3.7.1 Governance structure

Traditional 9-1-1 at the local level occurs in coordination with local service providers and, in some instances, immediate neighboring jurisdictions. Wireless 9-1-1 made the 9-1-1 authorities look a little wider as the wireless radio signals would travel further crossing jurisdictional boundaries. Many of the NG9-1-1 functions and applications can take place anywhere and be shared by larger groups than ever before. This will require more coordination between the entities involved to operate the systems and govern their use. Governance can be prescribed by a legislative and/or regulatory authority, but will most likely be a result of contractual agreements such as a Memorandum of Understanding (MOU).

²² PLBs are portable units designed to be carried by an individual person instead of on a boat or aircraft. They can only be activated manually and operate exclusively on 406 MHz. < <http://www.sarsat.noaa.gov/emercbns.html> > (Last accessed April 20, 2009)

²³ TTY is the acronym for Teletypewriter. TDD is the acronym for Telecommunications Device for the Deaf. Both are telecommunications technology adaptations to enable deaf, hard of hearing or speech impaired persons to communicate via the written word.

²⁴ NENA IP-Capable PSAP Minimum Operational Requirements Standard NENA 58-001 June 9, 2007 Revised.

An issue to keep in mind is that local governments are likely to believe that they will lose control over PSAP operations if the state were to actively pursue any of these options. The reality is that none of the options alters the counties' ability to make their own decisions about matters relating to internal PSAP operations. Decisions that are theirs to make now will continue to be theirs to make in an NG9-1-1 environment. This makes participatory governance even more important.

5.3.7.2 Operational Management

The four options L.R. Kimball has identified all require some type of network operational management. This operational management should be from personnel that have the requisite skills for the activity they manage. This network operational management must be active or on call 24 hours a day. This may result in additional costs.

5.3.7.3 Training

All four options will require training on the new equipment and processes at the PSAP level. The new equipment will provide the capability to display additional information that the call takers will be required to understand. These will initially not be advanced technologies like text and pictures, but they will come. The need for training never ends, and as technologies continue to evolve, training will be required as these new technologies are deployed.

5.3.7.4 Staffing

Staffing at the state level may increase depending on the solution chosen. At a minimum there will be new skills required at the state level. Current personnel may have them, or it may be necessary to hire additional staff. State personnel should have the skills to effectively manage the service providers. Each option outlines the staffing implications of that option.

Staffing will require close review at the local level. The call volume should remain constant and not change with the new system. Although, new communications technologies may have an impact on call volumes as the public starts to use them, similar to what happened when cellular phones became ubiquitous. A review, or at least a close monitoring, of the staffing needs should be performed during the transition and the first year of operation.

As has been seen in other new system deployments such as CAD, the time to process calls increases as the staff learns to use the new equipment. Over time, as the experience is gained, the actual call processing times will be able to be determined and staffing adjustments can be made permanent.

6. IP SYSTEM OPTIONS

L.R. Kimball identified four IP-based 9-1-1 system options available to the State of Michigan. These options include State managed and prime contractor managed networks. When considering any of the options, the network must comply with the applicable NG9-1-1 recommended technical standards and documents from the organizations listed. The state should track new standards under development and implement them when they have been adopted by the standards development organization. Activities and organizations to watch include:

- IETF's working group – Emergency Context Resolution for Internet Technologies (ECRIT)
- NENA's requirement from VoIP/Packet Technical Committee's Long Term Definition (VTC-LTD)
- FCC's Network Reliability and Interoperability Council (NRIC) VII Focus Group ID
- ATIS' emergency services interconnection Forum (ESIF)

The four IP-based 9-1-1 system options are:

- A statewide prime contractor responsible for implementing and managing the statewide IP network
- Regional (geographic) contractors selected to be responsible for implementing and managing an IP network in that region
- State agency responsible for implementing and managing the statewide IP network
- Regional (geographic) agencies responsible for implementing and managing regional IP network in each region

The regional options can be any logical grouping of PSAPs that is acceptable to the stakeholders. For the purpose of these options, L.R. Kimball made use of the existing Emergency Management and Homeland Security districts as shown in Figure 2.

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Figure 2 – Emergency Management/Homeland Security Districts

Source: The Michigan State Police, “Emergency Management and Homeland Security Division Map”

[http://www.michigan.gov/documents/EMD_Map-2_5-12-05_124830_7.pdf],

(As viewed August 31, 2009)

6.1 OPTION 1 - A STATEWIDE PRIME CONTRACTOR MANAGED IP NETWORK

A prime contractor would provide the communications infrastructure and Next Generation 9-1-1 applications to all PSAPs. Service levels would be set by the state 9-1-1 Committee and/or the 9-1-1 Office, and meeting them would be the responsibility of the prime contractor. The state would be the customer of record for the contract, and would hold the prime contractor responsible for all issues. The prime contractor would be the single point of contact for the state for all issues with the delivery of NG9-1-1 calls and associated applications to each PSAP in the state.

The prime contractor could be:

- A qualified carrier providing the IP transport network and the public safety solutions
- A qualified carrier providing the IP transport network and subcontracting the services of a public safety solution provider
- A public safety solution provider subcontracting IP transport network connectivity from a qualified carrier or carriers
- A systems integrator subcontracting IP transport, connectivity and solutions

The prime contractor would be responsible for all service levels associated with NG9-1-1 call delivery along with supplemental and supportive²⁵ information as defined by NENA.

Statewide IP connectivity could be accomplished with services available by carriers currently operating in Michigan. Several solutions providers provide the NG9-1-1 functions as a service based on number of calls delivered or population served.

6.1.1 Technical Feasibility

This option would be the easiest for the state to manage. The state would have one prime contractor with which to interact. The prime contractor would design, configure, install, test and manage the IP network. Network addressing, circuit ordering and migration processes would be the prime contractor's responsibility along with ALI and call routing functions.

The various databases that will be required to accomplish the call routing functions include location, policy, and destinations. These databases will be managed by the prime contractor.

L.R. Kimball envisions that there would be a migration from the technology of the current 9-1-1 system, to IP transport and ultimately NG9-1-1. IP network transport and the ability to connect all PSAPs in the state is the beginning of this process. Considering all of the legacy PSAP Customer Premises Equipment (CPE) and analog telecommunications switches currently in use will be in existence for quite a while, IP gateways will be required to interconnect these devices to an IP network. The gateways would be required until most of these devices are replaced or upgraded so they can communicate using SIP protocol.

²⁵ NENA Technical Information Document on Network to IP PSAP Interface, 08-501, June 2004, pages 2-19 – 2-21. The NENA Future Path Plan describes three types of information related to an emergency call that are either delivered with the emergency call or that can be made available to the PSAP either through a query/response method initiated by the PSAP or as initiated by the network or a third-party. These sets of data include essential data, supportive data and supplemental data. Essential data support call delivery, arrive with the call and enable adequate response capability if no other information is available. Essential data includes callback number and caller location. Supportive Data is analogous to ALI data. It may be delivered with a call or requested by the PSAP during an ongoing call. Supplemental Data is data that can assist the emergency responder(s) in preparing to respond to the emergency. It may include for example: medical records, motor vehicle records, vehicle collision information, etc.

Using one prime contractor would limit the number of smaller networks that would need to be interconnected, thereby reducing the amount of border control required in the network and simplifying the network design and interconnections with other IP networks.

6.1.2 Operational Feasibility

This option would provide the state with a single point of contact for all system operational issues outside of the PSAP itself. Delivery of information to each PSAP in the state would be the responsibility of a single vendor. All service levels associated with the network would be the responsibility of the chosen vendor.

The local exchange carriers would continue to have a role in the provisioning of certain functions such as call delivery for the IP-enabled network. There will be coordination issues to negotiate and integrate into operational practices. These issues will be the responsibility of the prime contractor.

Connecting the legacy selective routers to the IP-enabled network may be an issue with some carriers. Traditional tariffs and telephone company rules in some states include language that allows a LEC to restrict equipment that could be connected to their network. This requirement was intended to reduce the potential of damage to the network. These issues will have to be resolved with coordination between the state and the chosen vendor.

The PSAP will need to be able to accept these new IP call formats. There are ways to use the existing equipment with a legacy gateway, but this should be a short-term solution. The selected vendor will have to adapt the IP enabled network to current PSAP equipment capabilities. The state and its PSAPs should work together to develop a migration plan to implement IP enabled equipment at all PSAPs.

Operationally a single contracted provider is the easier of the two recommended solutions. The operational management falls to a service provider who will have the required staff and skills. The state should have personnel with similar skills to oversee the contractor and ensure the Service Level Agreements are met. Staffing may be from existing personnel or new hires. Specific skill sets would be required to manage the following functions:

- Database development and management
- GIS development and operation
- IP network monitoring and maintenance
- IP network design
- Network security
- Project management
- Billing

6.1.3 Economic Feasibility

L.R. Kimball's budgetary estimate of what it would cost to implement this option is approximately \$80.2 million over six years. This includes capital and recurring costs in each year for network, database (call access), call routing and PSAP premise equipment.

During the transition from the current system to the NG9-1-1 system, current costs would continue to be incurred during the period in which both systems operate concurrently. Every effort should be made to keep the transition period as short as possible. An appropriate inflation rate may need to be added to these costs for budgeting purposes.

Year	State-level Deployment Total Costs
	-
2011	\$21,473,147
2012	\$10,638,747
2013	\$13,640,947
2014	\$11,474,280
2015	\$11,474,280
2016	\$11,474,280
TOTAL	\$80,175,681

Table 3 – State Level Deployment Total Costs

If Michigan’s 9-1-1 statute were amended to enable the Committee to go out to bid for the services of a prime contractor to manage a statewide IP 9-1-1 system, the efficiencies inherent in the economies of scale would likely result in a savings to Michigan’s consumers. This savings will come for a single procurement process as compared to multiple, duplicate procurement processes occurring in each region.

A complicating factor in determining economic feasibility is Michigan’s technical charge. The enabling statute allows “service suppliers” to levy an “emergency telephone technical charge” on their subscribers to cover the cost of providing E9-1-1 services. The Office does not accurately know the true cost to provide each of the current 9-1-1 system components (network, routing and database). An exact accounting of those specific costs would enable the State to know which costs would be reduced or eliminated by replacing the multiplicity of local 9-1-1 systems with a single statewide system.

Some of the costs currently incurred will continue to be incurred, because the service suppliers will still need to deliver their customers’ calls to the 9-1-1 system demarcation point and to keep their subscriber/customer data current. The technical charge is the mechanism for them to recover those costs. We can say with certainty that some current costs will be eliminated, some will be reduced, and some will be shifted from the service suppliers to the state. The existing mechanism for annually adjusting the rate based on actual costs could provide the mechanism for making adjustments based on costs that are eliminated or that shift as the migration unfolds. Regardless of whether the state moves forward to implement NG9-1-1 or not, we strongly recommend that the statute be amended to require the service suppliers to provide the State 9-1-1 office with a copy of the report sent annually to the local 9-1-1 districts. Furthermore, the Office should have the authority to ensure there is no duplication of costs or cost recovery.

The technical charge may assist in the deployment of a full IP solution, if it were used to enable the carriers to recover their costs.

Another important consideration to obtaining favorable pricing for an NG9-1-1 system is to conduct a competitive procurement. There is currently no clear policy in Michigan's existing framework supporting competitive 9-1-1 service suppliers. If the Committee believes it is good public policy to enable a variety of vendors to compete to provide the service, then the technical charge should be removed or revamped. The language of the statute provides only for incumbent local exchange carriers LEC to recover their costs from the technical charge, but not a competitive 9-1-1 service provider that is not a LEC.

All these issues should be resolved as soon as possible.

The state can expect one-time capital expenditures for the network, network equipment elements, PSAP premise equipment, software, training and provisioning. The recurring costs needed to maintain the system must be accounted for as well. To quantify these costs, the prudent course of action for the state is to promulgate a Request for Information (RFI) and/or a Request for Proposal (RFP) to the NG9-1-1 vendor and service provider communities. Once the RFI/RFP data is vetted and distilled, the State can then move forward in a logical fashion. Early engagement of the county stakeholders in the RFI/RFP process will ensure a balanced and sound proposal. One of these costs will be the network transport costs to the PSAPs.

The demarcation of the network and those costs should be determined by the state with input from the stakeholders. The demarcation point can be at the network side or the PSAP side. Transport from the network to the PSAP could be the PSAPs responsibility or the state's responsibility based on this demarcation point. The transport costs could be covered with existing funding streams as the current transport is covered in the technical charge.

6.1.4 Policy, Political and Other Considerations

This option constitutes a dramatic departure from the way things are done today. Local 9-1-1 authorities and PSAPs may mistakenly believe that the State will take over their 9-1-1 service. That concern may get in the way of effective dialog. It will be necessary to help such critically important stakeholders more clearly understand that NG9-1-1 involves practical partnerships in ways that the current system of E9-1-1 did not. Local functions such as staffing, answering calls and dispatching will remain under local control. However, functions associated with system interconnection, IP network management, data services and data rights, etc. simply must be managed at a higher level. It does not detract in any way from how Michigan's counties do what they do best: answer and respond to 9-1-1 calls. Traditional 9-1-1 service providers—the local exchange carriers—may be concerned that they will lose revenue. The states that have launched pilot projects in partnership with their LECs and PSAPs demonstrate the positive benefits of approaching the challenge collaboratively.

If the state desires to allow a non LEC to compete to provide 9-1-1 service, the regulatory environment would need to change with regard to the technical charge to enable that to occur. At some level, operational and economic matters are also matters of policy and politics. As previously described, state-level oversight by statute in Michigan is provided by the Committee and the Office. The Committee has authority to recommend technical and operational standards for PSAPs, to recommend model 9-1-1 systems and to provide assistance for the design, implementation and operation of those systems, but does not have rulemaking authority.

While the state-level oversight that the Committee enjoys is more centralized than its counterparts in some other states, the 9-1-1 Office's lack of rulemaking authority is a concern that should be remedied. We have previously recommended that rulemaking authority for 9-1-1 matters be transferred from the MPSC to the Committee and/or Office. We reiterate this information here because an ESInet, by its nature, requires a higher level of management oversight than is necessary in the traditional E9-1-1 environment. The Committee or the Office must have the authority to set and enforce standards, and to manage the high-level technology functions associated with NG9-1-1. This is not optional.

It should be clear that NG9-1-1 is not a "local exchange service" in the manner that E9-1-1 has been. As the nature of 9-1-1 service evolves away from the regulated telephone industry the regulatory environment must evolve to reflect the new reality. The 9-1-1 technologies included in the existing framework are those associated with the legacy, analog telephone environment (e.g., selective routers, ALI database, PSAP functionality, network infrastructure). Michigan's current laws, regulations (what few exist) and tariffs need to be overhauled in order to pave the way for the competitively and technologically neutral environment that is necessary to establish an ESInet backbone for NG9-1-1.

Not only does the existing regulatory and statutory framework present an impediment to competition in 9-1-1, L.R. Kimball's analysis is that Michigan's current statute does not authorize the state (whether the Office or the Committee) to provide a statewide 9-1-1 system. Current statute establishes 9-1-1 service delivery (staffing, call answering, dispatching and emergency response) at the county or 9-1-1 district level. All associated provisions (funding, governance and the system's technological components) reflect that structure. If the State were to decide to provide an IP network for 9-1-1, the statute would need to be changed. The Committee's role is advisory, so it does not have any real ability to effectively coordinate the statewide planning and migration of county-based or regional systems – something that is necessary to ultimately achieve a statewide, interconnected IP network. The E9-1-1 program office could fill that role.

We are sensitive to the fact that any effort to expand its authority might be met with concern or resistance on the part of local government, PSAPs and 9-1-1 service districts. This is due to a lack of understanding of the unique requirements of NG9-1-1 that, out of necessity, can only be met at the state level. Our experience tells us that the most effective way to avoid or mitigate this potential roadblock is to provide a mechanism for stakeholder participation in decisions that affect them and to do everything possible to communicate frequently and openly with all concerned. The Committee effectively fulfills this role and may need to increase contact with its constituents during the planning and implementation process. We are confident that when the stakeholders fully understand what makes NG9-1-1 different from E9-1-1, and understand that the full benefits of NG9-1-1 will not be possible for them and the public without strong state-level involvement, the prospect of a local/regional/state partnership will be welcomed. Ultimately, the Committee must make decisions based on what is the best public policy, not on individual interests.

Migrating from the existing E9-1-1 networks to a fully functional ESInet capable of supporting NG9-1-1 will demand the State E9-1-1 Committee and the MPSC make a firm commitment to move forward. Replacing the outdated and technologically limited analog systems currently deployed in Michigan's most mission-critical public safety system must become a strategic imperative. Michigan citizens deserve a level of first response that supports 21st century communications devices.

It is likely that any change to the status quo would be met with resistance from the incumbent E9-1-1 networks service providers, as well. From their perspective, a change from the current multiplicity of local 9-1-1 systems to a seamless, statewide ESInet could potentially result in a loss of revenue for them, and would be perceived as not being in their best interest. Therefore, the state must make a genuine effort to include the incumbent E9-1-1 networks service providers in the strategic planning process. This effort by the state will impart a sense of partnership for these providers and additionally afford them an opportunity to opt-out in the provisioning of the NG9-1-1 system if they choose.

6.2 OPTION 2 - REGIONAL PRIME CONTRACTOR MANAGED IP NETWORK

A regional carrier or public safety solutions provider could be the Prime Contractor providing the IP transport infrastructure and Public Safety Solution applications to all PSAPs within a geographic area, or a single Prime Contractor could contract and manage local carriers within regions. Service Levels would be set by a state agency and be the responsibility of the Prime Contractor within that region. The State of Michigan would hold the regional Prime Contractors responsible for all issues within their respective regions. Multiple providers could support this option.

Coordination of regional interconnections to create statewide IP connectivity would have to occur. This could be accomplished by the State, a third party, or by one of the regional prime contractors.

Each of the regional prime contractors would provide a single point of contact for the state for all issues with the delivery of NG9-1-1 calls and associated applications within its respective geographical area. The prime contractor could be:

- A qualified carrier providing the IP transport network and the public safety solutions
- A qualified carrier providing the IP transport network and subcontracting the services of a public safety solution provider
- A public safety solution provider subcontracting IP transport network connectivity from a qualified carrier or carriers
- A systems integrator subcontracting IP transport, connectivity and solutions

Statewide IP connectivity utilizing a regional design could be accomplished with services available through several regional carriers in Michigan. Several regional carriers also have resale agreements with public safety solutions providers to supply 9-1-1 applications services through the network. A statewide overlay to achieve interconnection between the regions would be needed to achieve statewide coverage using a regional approach.

6.2.1 Technical Feasibility

This option presents the challenges of managing the interconnection of smaller regional networks within the state of Michigan. Multiple regional Prime Contractors interacting and connecting with each other including requirements for border control and security would be just a few of the issues that would have to be managed in this option.

Additional interconnection specifications such as protocols would have to be established between each “independent” network, which would allow information flow between all networks.

The IP transport protocol could vary from region to region requiring additional devices to convert signals between networks. This conversion may add latency to the call path that may degrade the quality of the data. The IP address assignments between the regions would have to be managed to prevent duplication of addresses.

All of the features of a single statewide network would exist within each regional network. This option would allow the regions to choose different IP network transport providers along with public safety solution providers. This would be a more flexible vendor solution for the regions by allowing them to develop their regional system to more closely match their needs. The result would be a statewide “Network of Networks” which could be accessed from anywhere within the state. Minimal network features would include:

- E9-1-1 Call Processing
- Call Routing
- Default Routing
- Alternate Routing
- Call Transfer
- Receipt of Call Location Information
- Location Information
- Data Sharing

6.2.2 Operational Feasibility

This option would provide the state with a single point of contact for all operational issues within a region. Delivery of information to each PSAP in each region would be the responsibility of a single vendor. All service levels associated with the network within each regional network would be the responsibility of the regional vendor.

The Local Exchange Carriers will continue to have a role in the provisioning of certain functions of call delivery for the IP enabled network. There will be coordination issues to negotiate and integrate into operational practices. These issues will be the responsibility of the chosen vendor within each region.

Connecting the legacy selective routers to the IP-enabled network may be an issue with some carriers. Traditional tariffs and telephone company rules have included language that allows a LEC to limit connectivity to their equipment or network. This policy was intended to prevent damage to the network. These issues will have to be resolved with coordination between the state and each regional vendor.

A coordination plan will have to be established specifying how each regional vendor interconnects to each other. Specifications on how information will be transferred between regional IP networks will have to be met by each regional vendor.

Additional oversight or governance should be provided at the regional level. Regional entities can be created using existing cooperative entities where they exist. This could be accomplished using MOUs, Agreements, or regulations.

The States major operational requirement for this option is to develop interconnection standards and to coordinate the interconnection between the regions. This is an important role for the state.

Although this option is the establishment of interconnected regional networks, the state’s role is not insignificant and will require specific skill sets at the state level to manage the following functions:

- IP network monitoring and maintenance
- IP network design
- Network security
- Project management
- Billing

6.2.3 Economic Feasibility

L.R. Kimball’s budgetary estimate of what it would cost to implement this option is approximately \$133 million over six years. This includes capital and recurring costs in each year. These costs are based on current state contract pricing. Estimates are based on eight regions like the regions of the emergency management and homeland security regions currently in Michigan. An appropriate inflation rate may need to be added to these costs for budgeting purposes.

Year	8 Region Deployment - Total Costs
2011	\$42,962,773
2012	\$17,928,373
2013	\$20,930,573
2014	\$17,097,240
2015	\$17,097,240
2016	\$17,097,240
TOTAL	\$133,113,439

Table 4 – 8 Region Deployment

This option is significantly more costly than the single, statewide Prime Contractor option. Furthermore, moving to a regional ESInet would require major changes to the current funding mechanisms. At present service suppliers recover their costs to provide 9-1-1 through the technical charge, and the counties do not directly pay for the service. The county 9-1-1 surcharge covers all their costs except for 9-1-1 infrastructure cost. A new mechanism to fund a regional ESInet would need to be established.

6.2.4 Policy, Political and Other Considerations

Most of the policy and political considerations associated with this option are the same as the previous option. The difference is that there may be greater buy-in on the part of local governments and 9-1-1 service providers.

6.3 OPTION 3 - STATE MANAGED STATEWIDE IP NETWORK INFRASTRUCTURE

In this scenario, the state of Michigan would be the Prime Contractor providing the IP connectivity infrastructure and public safety solutions to all PSAPs in the state. Service Level Agreements with each IP infrastructure provider and the public safety solutions provider would be the responsibility of the State of Michigan. This configuration would allow the State of Michigan to use existing state contract pricing for services. The Committee and/or Office would be responsible for coordination between all service providers. The state would have the option of contracting this to a management company.

IP infrastructure pricing for this configuration could be developed by utilizing regional carriers, long distance carriers, local fiber companies or any mix of data communications transport that meet public safety guidelines. The state would choose which services are best suited for the system.

The state would be responsible for all issues with the delivery of 9-1-1 calls and associated applications to each PSAP in the state. The state would manage subcontractors and hold them accountable to provide for service levels associated with the service they provide.

6.3.1 Technical Feasibility

This statewide option is technically feasible because most of the responders to the questioners indicated that they would support a statewide IP-based network by either utilizing their own networks and/or through agreements with other carriers. The management and monitoring of the network along with the trouble reporting process would be the responsibility of the State.

6.3.2 Operational Feasibility

In this option the State of Michigan would be the single point of contact for all operational issues outside of the PSAP. The state would be responsible for delivery of information to each PSAP. The network and hardware vendors would meet the state's established service levels. The state would then manage delivery of services to the PSAPs.

There will be coordination issues to negotiate and integrate into operational practices. For example, defining interconnection requirements from the call origination network to the NG9-1-1 system, defining interconnection requirements from the NG network to the PSAPs, defining requirements to interconnect to the statewide system (protocol, security, authorized traffic) and defining interconnection requirements to all other networks. The State of Michigan would be responsible for these issues.

This option will require state personnel with advanced skills. The policy and procedure development can be performed at the state level, and will possibly be able to be performed using current authority and mechanisms. This staffing may be from personnel already on staff, or with new staff. The skills required would be:

- Database development and management
- GIS development and operation
- IP network monitoring and maintenance
- IP Network Design

- Network Security
- Project Management
- Billing

If the state were to operate a system using this option, it must be supported 24/7. This would require a Network Operations Center (NOC) staffed at all times. The general guideline for staffing a single position 24/7 requires five employees. This Network Operations Center could be staffed by either a Vendor or state employees.

All other considerations are the same as those outlined in the first option.

6.3.3 Economic Feasibility

L.R. Kimball’s budgetary estimate of what it would cost to implement this option is approximately \$80.2 million over six years. This includes capital and recurring costs in each year. These costs are based on current state contract pricing. An appropriate inflation rate may need to be added to these costs for budgeting purposes.

Year	State-level Deployment - Total Costs
2011	\$21,473,147
2012	\$10,638,747
2013	\$13,640,947
2014	\$11,474,280
2015	\$11,474,280
2016	\$11,474,280
TOTAL	\$80,175,681

Table 5 – State Level Deployment

These estimates assume building a new network. If Michigan’s decision were to utilize the existing MDIT network, these costs would be lower. The scope of work of MSP’s contract with L.R. Kimball did not include an analysis of the MDIT’s contract with AT&T. While we are confident the State should see a cost savings with this approach, only a thorough review of the MDIT-AT&T contract would reveal the exact amount. We do know there will be special construction charges for any necessary fiber placement to PSAP buildings. Special construction charges are not predictable, even carriers will only estimate these after an order is placed. In addition, the MDIT network serves the business needs of state agencies and was not intended to meet the unique requirements of 9-1-1. The MDIT’s contract with AT&T would need to be amended to provide service level agreements to fully support the current and future requirements of 9-1-1.

Finally, Michigan’s technical charge is as much a factor in this option as in the first option. If Michigan’s 9-1-1 statute were amended to enable the Committee and/or the Office to provide a statewide IP 9-1-1 system and the technical charge were modified and closely monitored (by the Committee and/or Office) the efficiencies created would likely result in a significant cost savings to Michigan’s consumers.

6.3.4 Policy, Political and Other Considerations

While PSAP internal operations would continue unchanged, the state's responsibility for system operations outside of the PSAP would constitute a major policy shift from the way 9-1-1 is currently provisioned – greater than with any of the previous options.

The statutory changes needed for this option are nearly the same as for all the other options, but the difference would be in the need for a larger and more technically sophisticated state staff organization – something that would be essential if the state were to be its own prime contractor.

6.4 OPTION 4 - REGIONAL AGENCY MANAGED REGIONAL IP NETWORK INFRASTRUCTURE

The state would determine regions within the state to act as individual IP-enabled 9-1-1 networks. Each region would be responsible for designating a prime contractor responsible for providing the IP communications infrastructure, public safety solutions and future Next Generation applications to all PSAPs within a geographic area. Service Levels from all regional IP network infrastructure providers and public safety solutions providers would be responsible to the region's prime contractor. This option would allow the region to determine and manage pricing, services and service providers. The state would be responsible for coordination between regions and regional network interconnections.

IP infrastructure pricing for this configuration could be developed by utilizing Regional Carriers, Long Distance Carriers, local fiber companies or any mix of data communications transport that meet public safety requirements. Public safety solutions providers also would be chosen by the region and multiple public safety solutions providers could exist in the state. The region may choose which services are best suited for the system.

The state would provide interconnection standards with which each regional IP 9-1-1 network would have to comply before it would be allowed to interconnect the other regional IP networks. The interconnection between the regional networks would allow access to information across all regions in the state. The regional Prime Contractors and public safety solutions providers would be responsible for 9-1-1 call delivery along with supplemental and supportive²⁶ information as specified in NENA documentation.

²⁶ NENA Technical Information Document on Network to IP PSAP Interface, 08-501, June 2004, pages 2-19 – 2-21. The NENA Future Path Plan describes three types of information related to an emergency call that are either delivered with the emergency call or that can be made available to the PSAP either through a query/response method initiated by the PSAP or as initiated by the network or a third-party. These sets of data include essential data, supportive data and supplemental data. Supportive Data is analogous to ALI data. It may be delivered with a call or requested by the PSAP during an ongoing call. Supplemental Data is data that can assist the emergency responder(s) in preparing to respond to the emergency. It may include for example: medical records, motor vehicle records, vehicle collision information, etc.

6.4.1 Technical Feasibility

This regional option is technically feasible because most of the responders to the questions indicated that they would support regional IP-based networks by either utilizing their own networks and/or through agreements with other carriers. Interconnection specifications would have to be established between each “independent” network which would allow information flow between all networks. This will then create a “Network of Networks” which could be accessed from anywhere within the state. The routing or transferring of 9-1-1 calls and data across regional networks would be through these regional network interconnections. Failover to other networks would be accomplished through redundant interconnections. The management and monitoring of the networks along with trouble reporting processes would be the responsibility of the state and interconnections between the state and the regional Prime Contractors would be required.

6.4.2 Operational Feasibility

In this option, each region designated by the State of Michigan would designate a single point of contact for all operational issues within the region. The region would be responsible for delivery of information and services to each PSAP within its geographic territory. The network and hardware vendors would provide service levels to the region.

The Local Exchange Carriers would continue to have a role in the provisioning of call delivery for the IP enabled network. There will be coordination issues to negotiate and integrate into operational practices. The State of Michigan and individual regions would be responsible for these issues.

Potential connectivity roadblocks caused by tariffs and telephone company rules may be as much a factor with this option as with option 1.

As with the previous option, the existing PSAP equipment could continue to be used with a legacy gateway interface, but this should be a short-term solution. Each region will have to plan to adapt the current PSAP equipment to the IP enabled network, and have a migration plan in place to implement updated PSAP IP enabled equipment over time.

A coordination plan would have to be established specifying how each region would interconnect to the others. Specifications on how information will be transferred between each regional IP network will have to be established at a state level.

This option will require regional personnel with advanced skills to operate. Each region would need to have staff with the following skill sets.

- Database development and management
- GIS development and operation
- IP network monitoring and maintenance
- IP Network Design
- Network Security
- Project Management
- Billing

Alternatively, these staffing functions could be centralized and consolidated at the state level. Additional oversight or governance should be provided at the regional level. Regional entities can be created using existing cooperative entities, or create new entities. This can be accomplished using MOUs, inter-local agreements, regulations or statutes.

If the state were to use the regional option, it must be supported 24/7. This would require a Network Operations Center (NOC) staffed at all times. The general guideline for staffing a single position 24/7 requires five employees. This Network Operations Center could be staffed by a vendor, regional employees, or State employees.

The state’s major operational requirement for this option is to develop interconnection standards and to coordinate the interconnection between the regions. This is an important role for the state.

6.4.3 Economic Feasibility

L.R. Kimball’s budgetary estimate of what it would cost to implement this option is approximately \$133 million over six years. This includes capital and recurring costs in each year. These costs are based on current state contract pricing. An appropriate inflation rate may need to be added to these costs for budgeting purposes.

Year	8 Region Deployment - Total Costs
2011	\$42,962,773
2012	\$17,928,373
2013	\$20,930,573
2014	\$17,097,240
2015	\$17,097,240
2016	\$17,097,240
TOTAL	\$133,113,439

Table 6 – 8 Region Deployment Costs

This option is significantly more costly than the single, statewide Prime Contractor option. Furthermore, as noted in option 2, moving to a regional ESInet would require a mechanism to fund a regional ESInet.

6.4.4 Policy, Political and Other Considerations

The considerations associated with this option are the same as those inherent in the other options. See the first option for a complete discussion. As noted in the policy discussion associated with the second option, the primary difference between the issues associated with a statewide option and those associated with a regional option is the degree of comfort and buy-in at the local level.

7. RECOMMENDATIONS

7.1 TRANSITION STEPS

To assist the State of Michigan in transitioning to an IP-based 9-1-1 system, there needs to be a detailed transition plan. This plan, in fact, may be several plans due to the complexity of some of the tasks required. This section will outline the parts that need to be included in these transition plans.

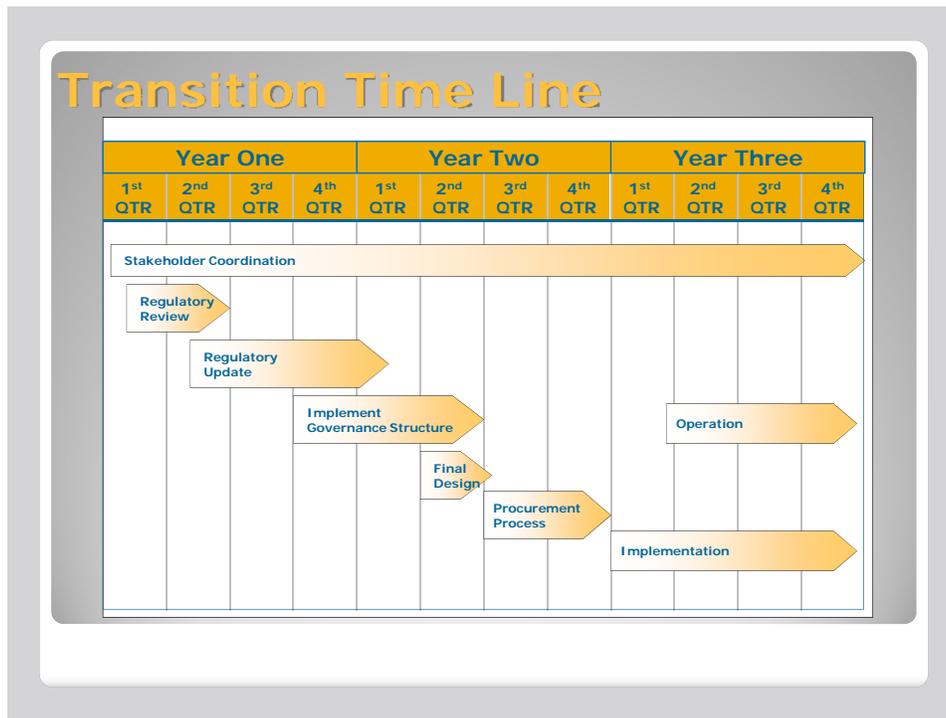


Table 7 – Transition Time Line

7.1.1 Stakeholder Coordination

One of the biggest factors in any major technology project is the stakeholder involvement. For the transition, stakeholder coordination should be ongoing throughout the project. This involvement will change based on the task involved. In general, the following groups of stakeholders should be involved during these tasks.

TASK	STAKEHOLDERS
Education	9-1-1 Entities Public Safety Response Agencies Regulatory Agencies Elected Officials Service Providers General Public
Regulatory Review and Update	9-1-1 Entities Public Safety Response Agencies Regulatory Agencies Elected Officials Service Providers General Public
Governance Structure Implemented	9-1-1 Entities Public Safety Response Agencies Regulatory Agencies Elected Officials Service Providers General Public
Final System Design	9-1-1 Entities Public Safety Response Agencies Service Providers
Procurement Process	9-1-1 Entities Regulatory Agencies Service Providers
Implementation	9-1-1 Entities Service Providers
Operation	9-1-1 Entities Public Safety Response Agencies Regulatory Agencies Elected Officials Service Providers General Public

Table 8 – Tasks Assigned to Stakeholders

This stakeholder coordination will provide:

- Broader perspectives and knowledge when developing documents and solutions
- Larger number of participants to help educate other stakeholders
- Cooperation from stakeholders as participants rather than outsiders

7.1.2 Regulatory Review

A detailed review of all relevant regulatory materials should be conducted. This review should include legislation, regulations, tariffs, and contract language related to the functions of delivering 9-1-1 today. Developing a focus group of stakeholders and subject matter experts to review the status will offer various perspectives.

A high-level review of the Michigan legislation can be found in Appendix E the “Initial NG9-1-1 Policy Analysis Report.” This report was developed in March 2009 as a part of this project for the State of Michigan. This report outlines area of legislation and regulation on which to begin the exercise.

The options listed in this report provide direction on legislation and regulation that should be examined during this phase. All legislation, regulation, tariff, and contracts should be reviewed with the selected NG9-1-1 strategy in mind.

7.1.3 Regulatory Update

At the completion of, or during the review of the regulatory framework, proposed changes should be developed. These changes should be developed using focus groups of all stakeholders to garner wide support for the proposed changes. The Policy Analysis document mentioned above and section 7.3 of this report outlines several specific areas of focus for this process. Anything identified during the regulatory review should also be included.

Regulatory change is a time-intensive process. Taking advantage of the focus groups to examine all angles of proposed language in advance may help to speed the process. Stakeholders that achieve consensus and present a united front will have the best chance of succeeding in bringing about the needed changes.

7.1.4 Governance Structure implemented

The updated regulatory environment should include a governance structure that can be used in both the transitional and operational phases of the NG9-1-1 system. This structure should include:

- Participation of all stakeholders
- Rule making authority
- Contracting authority
- Enforcement authority

7.1.5 Final System Design

This report provides a recommended direction given all options available to the State of Michigan. This may be altered as a result of the changes in the regulatory environment. At the completion of that process, the governance entity and the stakeholders should review any changes in the 9-1-1 technologies that may have taken place, and any new objectives of the stakeholders to develop a final design. This final design should be detailed enough to drive the procurement process.

7.1.6 Procurement Process

The procurement process for hardware and software begins with stakeholders’ input and the final system design. Based on these and the regulatory environment, the state or region must decide whether it will own the system outright or use a managed service contract.

NG9-1-1 services are, and will be, available from various vendors that can be purchased or contracted. These services may not all be available in both procurement methods. The advantages and disadvantages of these procurement options are highlighted in the following table.

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

Table 9 – Advantages/Disadvantages of Procurement Options

The final deployment may be a combination of these. The high-level services may be owned, with specialty services procured from a managed service provider.

The question of owning the system or using a managed service is a matter of funding and preference. Owning a system will require capital funds up front, with smaller recurring operational costs. A managed service requires little or no capital costs in the beginning of the project, but has larger recurring costs.

If the technology is purchased outright, maintenance contracts should specify that new features and upgrades will be included in the price. Some software licensing agreements include maintenance on the software, but new features are additional costs.

Should funding not be a concern, a managed service would allow the State of Michigan to deploy these technologies and upgrade more easily as new standards and features are implemented. This also allows upgrades to the hardware and software. Those upgrades will be handled by the managed service provider. This results in the state not having to provide the new hardware and perform software upgrades.

7.1.6.1 Methods of procurement

There are many methods of procurement. The following is a partial list:

- State contract
- Single-source (also called sole source) contracting
- Add on to existing contracts
- Request for bid (RFB)
- Request for proposals (RFP)

At this time, the state contract may be available for parts of the final solution, but it is not capable of being used for the total system. An RFB is used for commodity-type products. This is not an appropriate mechanism for procuring a complex system like NG9-1-1. Lastly, single source and add-ons to existing contracts are not competitive. Competitive processes like an RFP can be used to reduce prices in some cases, but more importantly will allow multiple solutions from which to choose the best fit for the state.

7.1.6.2 Request for Proposal Process

The RFP process allows for competitive procurement. The RFP process outlines requirements and allows potential vendors to describe how their solution will meet the requirements. This allows the state to choose the system that best meets their needs. An RFP is made up of the following sections.

- Project information
- Terms and conditions
- Proposal, submission and review processes
- Technical specifications

The technical specifications will be based on the final design and the needs of the stakeholders. The IP-enabled network requirements should include components such as:

- Network IP
- Managed services
- Network interfaces
- Capacity
- Overflow
- Redundancy
- Call routing equipment
- Switch
- Location Database
- Call Control Server
- Security
- Firewalls
- Border control
- Security Monitoring and management

7.1.7 Implementation

Implementation comes at the completion of the procurement process. During implementation, there are three major functions that should be performed: implementation project management, testing, and transition. Implementation of the new system based on the procured system design is critical to the success of the system.

It is important to have a project manager overseeing the project. The project manager can be a state employee or third party. The selected vendor should also have a project manager. This person will be able to track the progress of the project and help to identify and resolve issues quickly.

Testing of each component, individually, as well as all the various components working as a total system should be performed. This testing should be done by the selected vendor, but monitored by a technical resource from the state or third party. The total system testing is important as each individual component may work well, but when connected to another system component, may fail. A detailed and complete test plan should be developed and followed during the testing. The functions from the procurement documents should be used to develop this plan.

A transition plan is also needed. This transition plan should detail the process and the steps needed to move the PSAPs and carriers from the legacy network to the new system. This should include the steps that must be taken by the various entities prior to attempting to connect. This plan should also include back out processes in the event of issues during or immediately following the transition.

Due to the size and complexity of NG9-1-1 and IP systems, a phased implementation should be developed. This should be based on readiness of the PSAP and carriers to connect. This build-out can be based on:

- Region – all entities in a region then move to the next region
- Services area – all entities in a carrier’s foot print
- PSAP types – all PSAPs over 20 positions first, then smaller
- Carrier service type – all wireless carriers first, then VoIP

7.1.8 Operation

At the completion of the implementation, the system will need to operate. During this phase, the system will need to be monitored. There will be constant updates and changes as new devices and technologies are developed and deployed. Maintaining the system with new features and software patches will need to be managed. Making use of the governance structure to develop the policies to operate the system will allow for wider input to the long-term operation of the system. Proper use of the governance structure will allow the system to be kept current with changing technologies.

One of the most important things to have done during the operations phase is to have regular reviews and updates. It is important to review these items against the goals of the system and emerging technologies. New technologies may not be ready to be introduced to the system, but monitoring them will allow adjustments to be made proactively. The following areas should be reviewed annually or more often:

- Legislative, regulatory, tariff, and contracts
- Governance model
- Policies and procedures
- System capacity
- System function

7.2 PRIMARY RECOMMENDATION

L.R. Kimball recommends the state selects a public safety solution provider or carrier to be the prime contractor providing the communications infrastructure and Next Generation applications to all PSAPs.

The state would establish mandatory service levels, and meeting them would be the responsibility of the prime contractor. The state would hold the prime contractor responsible for all issues. Service levels along with supporting reports would have to be carefully defined to ensure the prime contractor meets the specified obligations.

The prime contractor would be responsible for the IP enabled network and ESInet services distributed to each PSAP and service location. The prime contractor will be responsible for specific service levels and provide the state with a single point of contact for all issues. The prime contractor can sub contract carriers, service providers, and equipment vendors as required to meet the requirements of the State of Michigan. The prime contractor will operate the ESInets as a managed service and provide the state with reporting on how service levels are being met.

Transition issues would be coordinated through a single entity in this configuration. The use of a single prime contractor creates a common interface point for resolution of all issues and eliminates conflicts between vendors in error resolutions.

Selection of a single prime contractor would allow the successful vendor to implement several technical efficiencies. The state wide solution would require fewer network and software “layers” and these efficiencies would result in efficiencies in software and hardware configurations. The statewide configuration may also require fewer software licenses, which could result in cost savings.

The single prime contractor concept also creates a single point of billing for the state.

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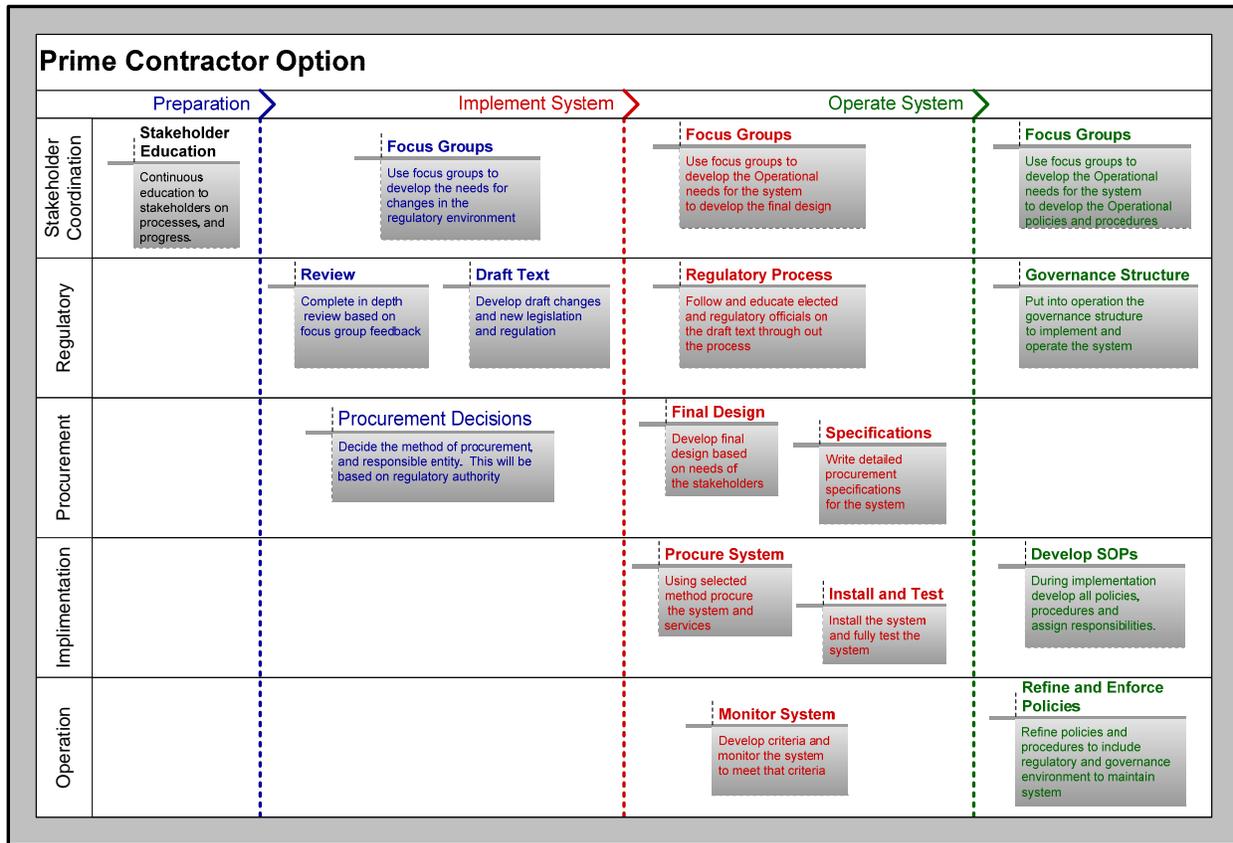


Table 10 – Prime Contractor Option

7.3 SECONDARY RECOMMENDATION

L.R. Kimball’s secondary recommendation to the State of Michigan would be to define regional areas and select a prime contractor to provide the IP transport infrastructure and public safety solution applications to all PSAPs within a geographic area. Service levels and supporting reports would be the responsibility of the prime contractors within the regions. The state would hold the prime contractors within the regions responsible for all issues within that region. Service levels would have to be carefully defined to ensure the prime contractor within each region meets the specified obligations.

Management of each regional prime contractor could be the responsibility of the region or, alternatively, the State of Michigan.

The prime contractor would be responsible for the IP enabled network and ESInet services distributed to each PSAP and service location within a specified region. The prime contractor would be responsible for specific service levels within that region and provide the state with a single point of contact for all issues specific to the region.

The prime contractor within each region could subcontract carriers, service providers, and equipment vendors as required to meet the requirements of the State of Michigan. The prime contractor would operate the ESInets as managed service and report to the state on how service levels are being met.

Transition issues would be coordinated on a regional rather than a state level. This would provide a single point of contact per region for coordination.

Billing would be by geographical region back to either a regional entity or the state.

The state would have to develop interconnection standards, which would be supported by each region. These ESInet interconnection standards would provide a method of communication for ESInet information across the state. Service levels would be applied to these interconnection standards to ensure resiliency and redundancy across the regional ESInets.

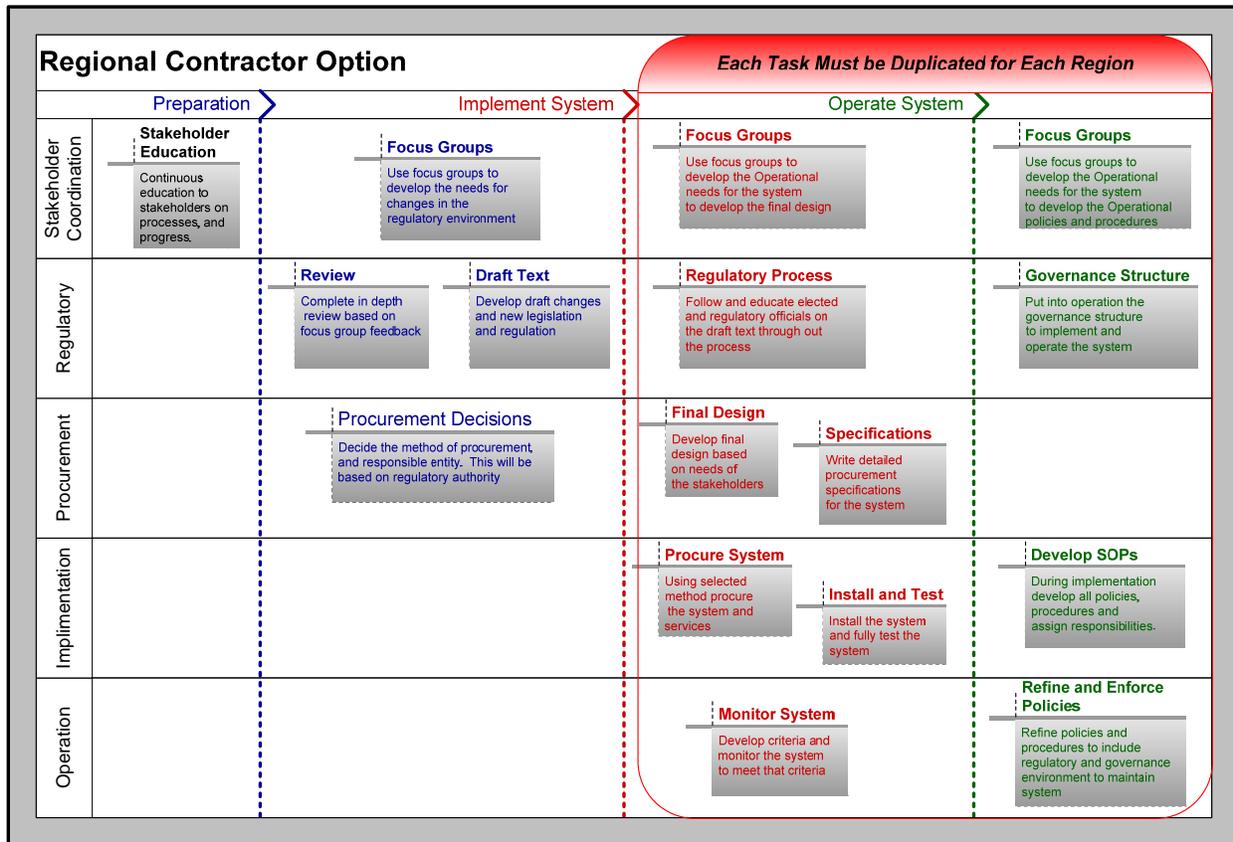


Table 11 – Regional Contractor Option

7.4 REGULATION/LEGISLATION AND TARIFFS REQUIRING CHANGE

The Legislature should eliminate statutory provisions that would prevent the deployment of a statewide ESInet or regional, interconnected ESInets capable of supporting NG9-1-1.

The Findings section (section four) of this Report listed several sections of Michigan statute that should be amended to complete the process of modernizing the law to enable a migration to NG9-1-1. We provide here an analysis and recommendations that include and expand upon what we listed in section four. These recommendations are not specific to the options presented in section six.

- MCL 484.1102 (a) and (b) are the definitions for Automatic Location Identification (ALI) and Automatic Number Identification (ANI), which are E9-1-1 features associated with legacy, landline voice telephone service. These definitions currently relate the terms to “9-1-1” rather than Enhanced 9-1-1. In addition, there is no definition of Enhanced 9-1-1. We do not recommend doing away with these definitions. We do recommend that the term “9-1-1” become “E9-1-1.” We further recommend that a definition of E9-1-1 include its features and functions, e.g., selective routing, ANI and ALI. This is important because the databases associated with NG9-1-1 are different. Furthermore, in the not-too-distant future, there will no longer be an ALI database the way we have historically understood it. We recommend that NENA’s definitions for NG9-1-1 database components be added to the definitions section of MCL 484.
- We further recommend the addition of NENA and industry definitions for ESInet, NG9-1-1, Internet Protocol, virtual PSAP, and any other terminology unique to NG9-1-1.
- MCL 484.1201 authorizes the implementation of E9-1-1 service only by counties. This provision appears to us to effectively prevent the state from implementing a statewide system, or from providing a statewide backbone network designed solely to interconnect the many local systems. We recommend the language be expanded to include the state.
- MCL 484.1204 requires 9-1-1 systems to be individually designed for each county and does not provide the option of a statewide design that would serve all the counties. County systems and a state system are not necessarily mutually exclusive. We recommend the addition of language that would provide flexibility and include statewide approaches.
- MCL 484.1205 provides that a 9-1-1 system shall process all 9-1-1 calls from “telephones” and does not provide for 9-1-1 calls from other types of devices. MCL 484.1102 (g) provides an excellent definition for what constitutes a “communications service” that is subject to the assessment of the 9-1-1 fee. It must if it is capable of “accessing, connecting with, or interfacing with a 9-1-1 system...by dialing, initializing or otherwise activating the 9-1-1 system” using telephones, cellular devices or “any other means. 424.1205 needs to be made consistent with the vision expressed in MCL 484.1102 and not limit the requirement to 9-1-1 calls made from “telephones within an exchange.”
- MCL 484.1401 authorizes “service suppliers” as defined to collect an emergency telephone technical charge to cover their costs to provide or interconnect with E9-1-1 system components. MCL 484.1102 defines service suppliers as persons providing communications services to users. MCL 484.1401, however, talks about the technical charge only in relation to “primary basic local exchange service.” This section needs to be broadened to reflect the definition of service supplier.
- MCL 484.1712 establishes the state 9-1-1 committee. We recommend modifying this section to change the committee from advisory to a fully empowered board or commission. A purely advisory committee is not adequate to undertake the activities necessary for NG9-1-1.

- MCL 484.1713 prescribes the membership of the Committee. The size of the Committee (21 members) is unusually large. State 9-1-1 boards or commissions are composed most typically of seven to eleven members. The size of the board is critical and so is its composition. Whether to include utility representation should be on the table for discussion. County/local government representation, PSAP representation, emergency responder representation (law enforcement, fire and emergency medical services), and public representation should be assured and written into the statute. The goal should be a balanced board that will – while being mindful of their constituents’ interests – nevertheless commit to taking unified and effective action in the interests of the state’s citizenry. We think nine members is a manageable board with the best potential to be effective and responsive in the fulfillment of its mandate.
- MCL 484.1714 establishes the committee’s duties. L.R. Kimball recommends giving a reconstituted committee the broad authority and powers necessary to lead the transition to statewide NG9-1-1 and oversee its operation. This is essential if Michigan is to effectively meet the requirements of E9-1-1 and NG9-1-1. The changes recommended include:
 - Relocation of rulemaking authority from the MPSC to the Committee and/or Office
 - Authority to establish and enforce service standards
 - Authority to design and procure statewide NG9-1-1 system components and oversee their implementation and operation
 - Authority to manage or contract for the management of the interconnections between local, regional or interstate ESInets

We do not recommend the removal of the technical charge arrangement at this time. It appears to benefit the traditional service suppliers, i.e., LECs and CLECs, by leveling the playing field for carriers with small subscriber bases, and enabling new telecommunications service suppliers to enter the market.

It also benefits local governments, as well. It provides flexibility for them to determine for themselves the number of trunks from the selective router, whether to provide separate trunks for wireless traffic, etc. It is not necessary under the technical charge provision for local government to enter into contractual arrangements for 9-1-1 service. The 9-1-1 service suppliers, LECs and CLECs recover their costs from the technical charge without ever invoicing the county. The costs of the 9-1-1 system’s technical components are set in tariff, approved by the MPSC, and reflected in the technical charge rate.

We undertook a high-level review of Michigan’s 9-1-1 service suppliers’ tariffs as part of this study. We note that these include definitions that describe E9-1-1 system components and functions in terms of legacy technology such as CAMA trunks. The tariffs do not provide for IP technologies and do not reflect current industry requirements for NG9-1-1. L.R. Kimball recommends the MPSC, with the involvement of the Office and Committee, initiate a proceeding to update the tariffs to eliminate any roadblocks to achieving NG9-1-1.

While we have assumed that Michigan would want to keep the state-level structure essentially intact, it may be desirable for Michigan to endow the Office with this authority, and preserve the Committee’s advisory role. It may also be desirable to elevate the Committee to the status of an independent state board and transfer the function of the 9-1-1 Office to the new board, and give it authority and responsibility for statewide E9-1-1 and NG9-1-1.

In L.R. Kimball's view, the most successful state 9-1-1 programs are those that have broad powers and authority for the statewide provisioning of 9-1-1, have adequate funding and control over that funding, and function autonomously. Michigan's program could adapt easily by making the modifications to existing legislation outlined in this section.

Michigan has a tremendous opportunity ahead of it. The public expects public safety to embrace new communications media in the same manner as they already have. These services will be essential to the state in the future. Michigan's telecommunications companies are already in the process of changing to a modern IP technology platform for their business purposes. The migration to IP enabled 9-1-1 systems is inevitable. It is our hope that Michigan's industry and public sector (local, regional and state-level) stakeholders will find the information contained in this report useful in facilitating the changes necessary to have not only IP enabled 9-1-1, but full NG9-1-1 and all the public benefits that will come with it.

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APPENDICES

APPENDIX A – PSAP SURVEY

Directions for Completion of the PSAP Survey Forms

- 1 Select the tab of the sheet you wish to complete.
- 2 Start with the tab labeled PSAP Contacts.
- 3 Please fill out the forms to the best of your ability. However, not all information will apply to all PSAPs. Should you not be sure how to fill out a question leave it blank. Your input is important to this process. Should you need more space to properly address a question, please feel free to alter the form to accommodate any additional space needs.
- 5 Please complete the forms by **January XX, 2009** and return to Jerry Christians via e-mail (<mailto:jerry.christians@kimballcorp.com>)
- 6 For any questions or problems with these Survey Forms please contact: Richard Hanlon of L. Robert Kimball & Associates at 774-232-0325 or via e-mail rich.hanlon@kimballcorp.com.

PSAP Contacts

PSAP Name (enter here)

Site Address:

Primary Contact

Name:
Telephone:
Cellular:
E-Mail:
Fax:
Mailing Address:

Alternate Contact

Name:
Telephone:
Cellular:
E-Mail:
Fax:
Mailing Address:

Technical Contact

Name:
Telephone:
Cellular:
E-Mail:
Fax:
Mailing Address:

Operations Contact

Name:
Telephone:
Cellular:
E-Mail:
Fax:
Mailing Address:

Secondary PSAP Name

Contact:
Telephone:
Site Address:

Number of Agencies Served:	
1	Law Enforcement _____
2	Fire/Rescue _____
3	EMS _____
4	Other _____ For example: Animal Control, DOT, etc.

PSAP Positions

1. Does the PSAP use separate call taker and dispatcher positions or are the functions combined?

a.

2. Total Number of Call Takers/Dispatchers:

a.

Full Time Equivalentents (FTEs)

b.

Part Time

3. What is the total number of console positions:

a.

9-1-1 Call Taker and Dispatch, if combined

b.

9-1-1 Call Taker only

c.

Dispatch only

4. Do you have enough positions to handle call volume?

(yes/no)

(If "No" explain below.)

Comments:

PSAP Name: _____

1. Call Processing

a. Describe how incoming 9-1-1 or emergency calls are processed and dispatched.

Please include police, fire, and EMS calls and whether transferred calls are documented in CAD.

b. Describe how non-emergency calls are processed.

This refers to calls that require a field response, but are not an emergency.

c. Describe what type of administrative calls are handled by the dispatch staff.

Please note which type of calls, if any, are documented in CAD.

2. Secondary PSAP Facility and Procedures

a. Describe how 9-1-1 calls to the Secondary PSAP are processed and dispatched.

2. Back-Up Facility and/or Procedures

a. Describe any back-up facilities or procedures for a PSAP evacuation or catastrophic systems failure. Include generator and/or UPS power.

3. System Integration

a. Preferred types of keyboards or mouse?

b. Are there sufficient number of 911 trunks and admin lines to handle your call volume?

If No, please explain.

PSAP Name:

CAD

1. Does the PSAP use a CAD system?

If yes, please provide the following:	Manufacturer:	
	Version:	
	Originally installed:	
	Last update:	
	Workstation OS:	
	Server OS:	
	9-1-1 ANI/ALI Interface:	
	State/NCIC Interface:	
	Other Interfaces: (TDD, EMD, Paging, Fax, Mapping, Mobile Data, etc.)	
	Phase 1 Compliant:	
Phase 2 Compliant:		

2. Does the CAD system have the ability to support police, fire, EMS, and call taking functions?

3. Does the CAD system have the ability to recommend units for dispatch?

4. Does the CAD system provide premise/hazard information?

5. Is there a redundant CAD server in place? If yes, where is it located?

6. Does the CAD system need to be shut down to perform back-up functions?

 (If yes, estimate the number of hours weekly CAD is shut down for this reason.)

7. What is the process for updating CAD and Geo-file information? (Please include who does the updates and how often.)

Law Records Management System (RMS)

8. Does the PSAP use a RMS system?

If yes, please provide the following:	Manufacturer:	
	Version:	
	Originally installed:	
	Last update:	
	Workstation OS:	
	Server OS:	

Corrections Records Management System (RMS)

9. Is Corrections RMS in use?

If yes, please provide the following:	Manufacturer:	
	Version:	

Local Exchange Carrier Information

1. Local Exchange Carrier

Account Manager

Name: _____
Telephone: _____
Cellular: _____
E-Mail: _____
Fax: _____
Mailing Address: _____

911 Service Provider Information

2. 911 Service Provider

Selective Router/Tandem _____
Manufacturer _____
Model _____
CLLI code _____
Location _____
Location _____

3. Database Administrator

Name: _____
Telephone: _____
Cellular: _____
E-Mail: _____
Fax: _____
Mailing Address: _____

4. Account Manager

Name: _____
Telephone: _____
Cellular: _____
E-Mail: _____
Fax: _____
Mailing Address: _____

5. Service Manager

Name: _____
Telephone: _____
Cellular: _____
E-Mail: _____
Fax: _____
Mailing Address: _____

CPE

1. Is 911 CPE separate from the administrative phone system?

yes/no

2. Please provide the following for the PSAP's 9-1-1 CPE System:

a.	Manufacturer:	
b.	Model/Version:	
c.	Originally installed:	
d.	Last update:	
e.	Operating system:	
f.	Phase I ready:	
g.	Phase II ready:	
h. (Is the 9-1-1 system capable of receiving 20 digits (vs. 8 or 10) from the selective router?)		20 Digit capable:
i. (If not, will an upgrade be required to repeat or rebid ALI?)		Capable of rebids:

Administrative Phones

3. Please provide the following for the PSAP's administrative telephone system:

a.	Manufacturer:	
b.	Model/Version:	
c.	Originally installed:	
d.	Last update:	
e.	Operating system:	

Logging Recorder

4. Please provide the following for the PSAP's logging recorder:

a.	Manufacturer:	
b.	Model/Version:	
c.	Originally installed:	
d.	Total # of Channels Available:	
e.	# of Channels in Use:	
f.	Can capacity be expanded?:	
g.	Does it record radio?	
h.	Digital or IP Capable?	

Synchronized Timing System (Master Clock)

5. Does the PSAP uses a master clock?

yes/no

If yes, please supply the following:

a.	Manufacturer:	
b.	Originally installed:	
c.	List Systems Connected:	
d.	(CAD, CPE, radio, etc.)	
e.	Type of Connection: UTP or RS-232	

ALI

6. Do you have an on-site ALI system? If yes, provide the following

yes/no

a.	Provider:	
b.	Modem Speed:	
c.	Originally installed:	
d.	List Systems Connected:	
e.	Is there an ALI Fax?	

7. How many ALI circuits are at each location?

8. If your ALI is not in-house would you like to retain your current ALI provider or switch to in-house?

MSAG

9. Is the MSAG Database on site?

a. If not where?

TDD/TTY

10. Is TDD/TTY integrated on the workstation?

a. Do you have stand-alone terminals?
b. How many?

Instant Recall Recorder (IRR)

11. Is there an instant recall recorder on the workstation?

a. How many calls can it store?
b. Does it record radio calls also?

Radio Consoles

1. Please provide the following for the PSAP's radio consoles:

a.	Manufacturer	
b.	Model/Version	
c.	Originally installed	
d.	Last update	
e.	Operating system	

2. Describe any planned future console upgrades:

--

Paging and Alerting

3. Please provide the following for the PSAP's paging and alerting system (if any):

a.	Manufacturer	
b.	Model/Version	
c.	Originally installed	
d.	Last update	
e.	Operating system	

4. Describe any planned future paging/alerting upgrades:

--

Network Information

1	Date:	
2	PSAP Name:	
3	Number of CAMA Trunks on equipment:	
	a. How many wireline, wireless or combined?	
4	Number of Admin Lines/POTS Lines on 911 equipment:	
5	Do you have any direct trunks that bypass a Tandem?	
	a. If so, how many? What kind? (VoIP, ALI, etc.)	
6	Number of ring downs:	
7	Number of Make Busy Circuits:	
8	Do you receive any 9-1-1 calls via the Internet?	
9	Are there currently any Backup Phones (type of phones and numbers):	
10	Will ATA (analog terminal adapter) be required from Admin phones to connect to 911 equipment:	
11	Currently what type of wiring is going to the 911 equipment? What is the cable length?	
12	Number of spare CAT 6 jacks for new system at workstations:	
13	Should new CAT6 cables be installed as part of a new system?	
14	Is there Call Detail Record (CDR) on the system?	
15	Are there touch screens?	
	a. If not, do you want touch screens?	
16	Are there flat screens?	
17	What size monitors?	
18	Are there Genovation Keypads?	
19	Are Audio Interfaces used? Please describe.	
20	What type of Audio Interface device is at positions? How many devices are connected to it?	
21	How is the Radio connected to the 911 equipment?	
22	Number of Monitors currently installed per positions and in back room:	
23	Is there Remote Monitoring? If so what type of access? Dial up, DSL, etc	
24	Are there TVSS* devices installed on the incoming trunks and lines connected to the 911 equipment?	
NOTES:		

* Transient Voltage Surge Suppression

Equipment Room

1	Is the equipment room climate controlled?	
2	Is there space in the equipment room to install new equipment?	
3	Is there a dedicated electrical circuit provided for the 911 equipment?	
4	Is there a UPS? If so what type?	
5	Is the UPS outlets for both the back room and at each position?	

6 Equipment Room Dimensions (If possible, insert picture(s) or drawing)

length
width
height

Diagram or Picture (insert below)

Building Power Information

1. Building Service Feed

Provider:
Service Level (amps):

2. Generator for Building

- a. Fuel:
- b. Is there testing?
- c. Testing Procedures:

3. Transfer Switch (Automatic or manual?)

4. UPS for Center

- a. Manufacturer:
- b. Model Number:
- c. Age (date installed):
- d. Size:
- e. Current Load:

5. Grounding Comments

APPENDIX B - PSAP DATA

PSAP	CPE Manufacturer	CPE Model/Version	Date of CPE Installation	Date of CPE Update
Alger County	Positron	Power Phone	1993	2006
Allegan County Central Dispatch	Pro-tel	not provided	X	X
Alpena County Central Dispatch	CML/ Remote Sentinel	4	X	X
Antrim County	CML 911	4.08_004	11/1/2000	2008
Arenac County	not provided	not provided	X	X
Auburn Hills Police Dept.	POSITRON	POWER 911 4.10.3.5 SP3	1998	2003
Barry County Central Dispatch	Plant Inc	Vesta Pallas/ver. 2.6	2004	2008
Bay County Central Dispatch	SRX	SYSTEM 2	Unknown	1999
Belding Police Dept.	not provided	not provided	X	X
Benton Township Police Department	not provided	not provided	X	X
Berrien County Public Safety Communication Center	Positron	Life Line 100 912100-2	1/1/2000	4/1/2008
Beverly Hills Public Safety	not provided	not provided	X	X
Birmingham Police Dept.	Positron	not provided	X	X
Bloomfield Hills	IPC	not provided	X	X
Bloomfield Twp Police	Positron	not provided	12/1/1999	12/1/1999
Brownstown	POSITRON	not provided	X	X
Calhoun County	not provided	not provided	X	X
Canton TWP Public Safety	Motorola	Central Link	2002	none
Cass County	CML	not provided	X	X
Chelsea Police	Power 911	Power 911	6/1/2005	X
Chippewa Co. Central Dispatch	Positron/ Nortel	LIFELINE 100	2/1/2001	X
Clare County Central Dispatch	Positron	Lite Line 100	2002	na
Clinton Twp. Police	Motorola	Lifeline 100	Jun-01	X
Crawford Emergency Central Dispatch	not provided	not provided	X	X
Dearborn Heights Police Dept	Plant	VESTA M1/MAGIC	9/1/2003	2006
Dearborn Police Dispatch Center	Positron	not provided	X	X
Detroit	Meridien	Option 61	2006	2006
Dickinson County	MOTOROLA	not provided	1992	2000
East Lansing Police Department / Ingham County	SRX	System 2	X	1999
Eastern Michigan University PD	not provided	not provided	X	X
Eastpointe PD	Positron	Life Line 100	2004	2004
Eaton County Central Dispatch	SRX	System 2	1990	1999
Farmington Hills Police Dept.	not provided	not provided	X	X
Farmington PS	Ameritech	not provided	X	X
Fenton	Zetron	not provided	X	2003
Fraser DPS	positron	not provided	1999	n/a
Garden City PD	Unknown	not provided	X	X
Genesee County 911	not provided	not provided	X	X
Gladwin County	Nortel	not provided	2004	Scheduled Monthly

PSAP	CPE Manufacturer	CPE Model/Version	Date of CPE Installation	Date of CPE Update
Grand Rapids Police Dept.	Positron	not provided	2001	2001
Gratiot County Central Dispatch	CML	Sentinel	4/1/2006	X
Grosse Ile PD	Positron	not provided	X	X
Grosse Pointe Park Public Safety	Lifeline 100	not provided	1994	A Long Time Ago
Hamtramck PD	Positron	not provided	X	X
Harper Woods PD	not provided	not provided	X	X
Hazel Park PD	not provided	not provided	X	X
Hillsdale County	Plant Equipment	Maars System	4/1/1996	1/24/2002
Huron County	not provided	not provided	X	X
Huron Twp	not provided	not provided	X	X
Iosco County 9-1-1	Motorola	Central link	1996	X
Kalamazoo Integrated Dispatch	not provided	not provided	X	X
Lake County 911	Positron	LifeLine 100 Rev 2.2	1999	2005
Lansing/Ingham 911 Center	Protel	Vision Teltronics	1999	1999
Lapeer County E 9-1-1 Central Dispatch	not provided	not provided	X	X
Leelanau County	not provided	not provided	X	X
Lincoln Park PD	Positron	Lifeline 100	2001	2007
Livingston County Central Dispatch	Positron	Ver 4	1999	1999
Livonia Police Dept	Positron	Lifeline 100	before 2000	never
Macomb County Sheriff's Office	Motorola	not provided	X	X
Madison Heights	not provided	not provided	X	X
Marquette Co. Central Dispatch	Plant	Vesta	2003	2008
Mason Oceana 911	not provided	not provided	X	X
Meceola Central Dispatch	Positron	Lifeline 100	1999	1999
Menominee County	Positron	Power 9-1-1 Release 4.11.5.29	2002	none
Midland County Central Dispatch	SRX	SYSTEM 2	1993	1999
Milan Police	not provided	not provided	X	X
Milford	not provided	not provided	X	X
Missaukee County	AT&T	Viper	Jan '08	X
Monroe County Central Dispatch	Positron	Viper	3/1/2008	X
Montcalm County Central Dispatch	Plant CML	Sentinel - Version	2001	A Long Time Ago
Montmorency County	not provided	not provided	X	X
MSP Gaylord Regional Dispatch	Plant/CML	VESTA 2.2	10/6/2006	7/1/2008
Muskegon County	CML	Sentinel 9-1-1 Version 4.08	5/1/1997	10/1/2007
Negaunee Regional Dispatch	Nortel	Meridian	July 10th, 2002	N/A
Newaygo County Central Dispatch	CML	Sentinel	2002	2008
Niles City Police Department	AT&T	life line 100	1999	2007
Northville Township Department of Public Safety	Positron	not provided	2005	X

PSAP	CPE Manufacturer	CPE Model/Version	Date of CPE Installation	Date of CPE Update
Novi Regional 911	Positron	100	1998	X
Oak Park Public Safety	not provided	not provided	X	X
Oakland County Sheriff Dept	Positron	not provided	X	X
Ogemaw County	not provided	not provided	X	X
Oscoda County 911	not provided	not provided	X	X
Otsego County	Plant/CML	VESTA 2.2	10/6/2006	7/1/2008
Ottawa County Central Dispatch	CML	ECS1000	2002	2007
Pontiac Police	Positron	Lifeline 100	unknown	2008
Portage PD	not provided	not provided	X	X
Presque Isle County E911	CML	SENTINEL	X	In Process
Redford Police	Positron	Lifeline 100	1992	X
Richmond Police	POSITRON	SIMON	2003	2006
Rockford Regional Dispatch	PlantCML	Vesta Meridian 2.2	Pre-2003	At installation
Romeo Police Department	Positron	Simon	1992	2004
Romulus	AT&T	not provided	20 years ago	X
Roscommon County Central Dispatch	not provided	not provided	X	X
Royal Oak Police Department	not provided	not provided	X	X
Saginaw County	Plant CML	not provided	X	X
Saline Police Department	not provided	not provided	X	X
Sanilac County Central Dispatch	SRX	SYSTEM 2	??	1999
Second District Regional Dispatch Center (Detroit)	not provided	not provided	X	X
Shelby Twp Police dept	not provided	not provided	X	X
Shiawassee Co Central Dispatch	Housed off site/Verizon	not provided	X	X
South Haven Dispatch	Nortel	not provided	1991	X
Southfield PD	Protel	not provided	1998	NA
Southgate Police Department	positron	not provided	X	X
St Clair Shores PD	Nortel/Norstar	not provided	X	X
St. Clair County Central Dispatch	Plant	Vesta	3/1/2007	10/1/2008
St. Joseph County 911 Central Dispatch	CML	not provided	4/1/1999	Never
St. Joseph Police Dept.	not provided	not provided	X	X
Sterling Heights P.D.	Positron	Powerphone	2003	Non
Sumpter Twp Dispatch	not provided	not provided	X	X
Trenton Police	not provided	not provided	X	X
Troy PD	Motorola	Centralink 2000	Mar-98	N/A
Utica Police Dept	Positron	not provided	X	X
Van Buren Central	CML	not provided	4/2/1989	1/1/2008
Walker Police	Lifeline 100	not provided	2006	2008
Walled Lake PD	Positron	Lifeline 100, 2.2	1999	X
Wayne County Airport Authority Police	not provided	not provided	X	X
Wayne Police Dept	POSITRON	VIPER	12/1/2008	12/1/2008
West Bloomfield Twp Police dept	Positron	not provided	X	X

PSAP	CPE Manufacturer	CPE Model/Version	Date of CPE Installation	Date of CPE Update
Westland PD	Positron	Viper	2009	2009
White Lake Police	Positron	not provided	1991	2008
Woodhaven Police Department	not provided	not provided	X	X
Wyandotte PD	Positron	Viper	2009	2009
Ypsilanti PD	Positron	Lifeline with Power	2003	2007

* “Unknown” means the PSAP responded that it did not know the information requested in the survey.

APPENDIX C – SERVICE PROVIDER MEETING NOTES AND ATTENDANCE LISTS

Michigan Industry Meetings – January 22 & 23, 2009

There were three meetings: one in the morning and one in the afternoon on the 22nd and one in the morning on the 23rd.

Agenda

- Introductions
- Vision for NG9-1-1 In Michigan
- Project Overview – Status of Tasks
- Policy Considerations
- Questions

Industry Input/feedback – First Session

Kimball's RFPs are too long and too specific. The implication to prospective bidders is that Kimball has already designed the network, and that limits "imaginative and innovative" responses. In addition, the vendors do not have time to do a thorough job on a long RFP if they are required to respond to all sections. Vendors would prefer to have the opportunity to bid on specific section(s) of the RFP.

Short response timeframes do not enable vendors to collaborate with other vendors for the response.

States want 'one throat to choke' but this poses a problem for vendors who need to find a partner. Let vendors bid on one portion, and let the state put it together. Use an integrator to monitor and ensure system performance. The integrator would become the 'one throat.'

9-1-1 service standards need to remain high and new entrants to the market need to meet them. Require open architecture that has the flexibility to meet standards as they are developed.

There was a concern expressed about the fact that several SDOs are working on the same standards and it is not know which will be "The standard."

Interconnection with existing 9-1-1 service providers would provide a consistent level playing field.

It is important that states assure vendors are qualified; RFPs should require all respondents to be certified CLECs.

There needs to be a clear migration path for PSAPs if the state wants to put in a statewide network, and want to keep the old network in place for a while.

Reduce the number of service providers to zero. The state should own the cloud. Communication service providers have to get their calls to 911 and should figure out for themselves how to pay for it.

Some of the companies present that have already developed Next Generation applications inquired how databases currently residing in the carrier space will be transitioned, who would administer those databases, and who would own the ALI records.

The question arose about how PSAPs would pay to link to any statewide backbone. Ms. Miller-Brown responded, "The same way they do now."

The following comments were made in response to the question, "What can the state do to help the industry?"

- Require vendors to be CLEC certified
- Do not require NENA certification/accreditation, or put it in the RFP that vendors must become certified/accredited within a specific period of time
- Competitive providers need access to ALL records under Sec. 222 of the Telecomm Act
- The state should adopt the position of the Florida PUC, which has determined the ILEC cannot charge a PSAP for services it no longer provides to that PSAP(s)
- As PSAPs leave legacy arrangements, LECs increase their charges to the PSAPs that are left: this should be prohibited
- Ensure that whatever is done levels the playing field
- The FCC is grappling with the question of whether 9-1-1 is a local exchange service, as currently defined
- Eliminating carrier cost recovery will make 9-1-1 a cost center rather than a revenue generator

Industry Input/feedback – Second Session

According to the OSI model, many of the services being requested are at the application layer and not at the lower levels of the OSI model that are traditionally responsibility of service providers.

The question was asked about the PSAPs' ability or desire to have some of the services the network was being designed to accommodate. The questioners had issues with standards not being fully implemented for this type of network and procedures not yet in place to handle services such as SMS text.

Someone asked how the state of Michigan was going to address funding. The speaker noted that the wireless and VoIP service providers "self fund." He further said that PSAPs can put in IP-enabled CPE and do it with their current funding mechanism, but network, database and routing are a different matter and the state cannot fund this as currently structured. Michigan's current funding mechanism "doesn't allow the state to do this."

Someone asked how far out would the data transfer be funded: only to the PSAP? What about out to the responder's vehicle?

Someone expressed concern that there did not appear to be a "plan to communicate and get input from the industry."

Someone asked what tools and training the call takers would receive.

One network provider stated that any solution would "have to be like glass." His company provides a view of the current network traffic to both the wireless providers who have ingress to the network as well as the PSAPs that are served by the network. Only by providing this information to all parties involved will any implementation be successful.

Several of the regional telephone companies were concerned what would be requested from them in this network design. They were informed the network would require IP connectivity. Many had concerns of additional network based equipment being requested of them and the associated costs.

One network provider confirmed it will provide IP connectivity to its network and is active in the guidelines that NENA is developing.

A CLEC present asked if specific applications would be integrated into the network. He cited the example of a child calling 9-1-1 from his cell phone would have the capability of automatically conferencing in a parent at the time the call was placed. These and many other applications are available from VOIP service providers and if they would be integrated into the network.

Industry Input/feedback – Third Session

A statewide CLEC asked how AT&T and Verizon are working with the state to make sure CLECs are not forced to put in dedicated trunking to the ILECs' Selective Routers, which is inefficient.

Someone from the UP said there is a fiber network throughout the UP.

Someone suggested the state have a third-party agency provide and manage the core routers and network interface points.

IP-BASED 9-1-1 Meeting
January 22, 2009, 9:00 a.m.
SIGN IN

NAME E-Mail Phone #

- 1 LARRY NEPPER larryn@winntel.com 989-953-9810
- 2 DICK DICKINSON ddickinson@telecomsys.com 206-742-2224
- 3 Chris Robbins Chris.Robbins@intrade.com 847-303-5504
- 4 Bob Currier bcurrier@intrade.com 810 388-1911
- 5 Scott Silverstein ssilverstein@vixxi.com 253 9907³⁰³
- 6 Jannine Benedict jannine@mi.gov
- 7 Jennifer Greenburg jgreenburg@telecommsys.com 482-7809
- 8 Mark Gregory mgregory@indigital.net 260-469-2010
- 9 Mary Bogue mbogue@winntel.com 989-953-9822
- 10 Evelyn Bailey evelyn.bailey@kimballcorp.com 814-689-337
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20
- 21

**IP-BASED 9-1-1 Meeting
January 22, 2009, 1:00 p.m.
SIGN IN**

NAME	E-Mail	Phone #
1 ERIC SCHMIDTLEIN	Eric_Schmidtlein@cable.comcast.com	720-267-1474
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14 PHILIP BATES	philip.j.bates@verizonbusiness.com	989-723-0431
15 TODD MOCHERMAN	tmocherman@centwire.com	260-750-3223
16 ANDREANNA KIMERY	AKaswegan@centwire.com	260-750-3811
17 BOB REYNOLDS	rrreynolds@ameritech.net	889-553-0568
18 COLLEEN FORMAN	cforman@arci.net	989-550-0802
19		
20		
21		

IP-BASED 9-1-1 Meeting
January 23, 2009, 9:00 p.m.
SIGN IN

NAME E-Mail Phone #

- 1 Scott Temple ST2813@ATT.com 248-538-5750
- 2 Chris Horak HORAK@michepbl.org 517-482-2122
- 3 Duane Bronson dbronson@blanchardtel.com 989-561-9930
- 4 John Hunt john.hunt@oxstar.com 313-665-8125
- 5 Mark Grady mgrady@indisita.net 260-469-2010
- 6 Todd Gardner Toddg@iserv.net 616-493-3727
- 7 Mike Osborne mike.osborne@allcom.net 416-895-9911
- 8 Dave Velstee david.velstee@verizon.com 517-484-3666
- 9 PAUL STARK pwstark@up.net (906) 353-6644
- 10 Mark Iannuzzi marki@telnetww.com 248-485-1001
- 11 _____
- 12 _____
- 13 _____
- 14 _____
- 15 _____
- 16 _____
- 17 _____
- 18 _____
- 19 _____
- 20 _____
- 21 _____

APPENDIX D – PROVIDER SURVEY

1. Type of IP services available and where?
2. Do you have interconnections with other carriers and where?
3. Can you support the PSAPs with edge devices?
4. Are you interested in supporting the State of Michigan with Next Generation IP 911 services and features? And if so, to what extent?
5. Do you have any affiliations with any other companies that may help support a Next Generation 911 system?
6. Can you provide IP connectivity to all the PSAPs?

APPENDIX E – INITIAL NG9-1-1 POLICY ANALYSIS REPORT

Initial NG9-1-1 Policy Analysis Report

prepared for

**Michigan
State Police**

March 2009 ©

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1. INTRODUCTION

Michigan Compiled Laws (MCL) 484.1101–484.1717, also known as the *Emergency Telephone Service Enabling Act* (Act), governs the State of Michigan's (State) 9-1-1 service. The Act provides for the technical and managerial aspects of the State's 9-1-1 system, funding mechanisms for the 9-1-1 network backbone and the 182 Public Safety Answering Points' (PSAPs) capital and operating costs.

State-level oversight is provided by the State 9-1-1 Committee (Committee) with the assistance of the State 9-1-1 Administrator's Office. The Committee has authority to recommend technical and operational standards for PSAPs, to recommend model 9-1-1 systems and to provide assistance for the design, implementation and operation of those systems. The Michigan State Police (MSP) is responsible, by statute, for providing staff assistance to the Committee as necessary to carry out the Committee's duties and fulfills this responsibility through the State 9-1-1 Administrator's Office. However, the Committee does not have rulemaking authority through the MSP. Rather, that authority rests with the Michigan Public Service Commission (MPSC), in consultation with the Committee, for the following specific 9-1-1 matters:

- Uniform policies, procedures and protocols for 9-1-1 services in counties and PSAPs in the State
- Training standards for PSAP personnel
- Standards for the receipt and use of 9-1-1 funds
- Requirements for multi-line telephone systems

The MPSC has not yet promulgated these rules. However, since NG9-1-1 is inherently different from the historic regulated telephone service, this opens an opportunity for the State to reconsider the locus of rulemaking to reflect the changing 9-1-1 environment.

Michigan has made tremendous progress in implementing both landline and wireless Enhanced 9-1-1 service (E9-1-1) statewide, according to the Committee's *2008 Report to the Michigan Legislature*. All 83 Michigan counties provide E9-1-1 for landline telephones and Phase II E9-1-1 for mobile / wireless telephones. Despite these advances in the level of 9-1-1 service, communication technologies (and consumer adoption of them) are advancing at an even faster rate than 9-1-1 can accommodate. A recent NENA publication summed up the issue this way:

“Our nation's 9-1-1 system is being pushed to the edge and is increasingly falling behind as technology in the hands of consumers rapidly advances past the capabilities of the current E9-1-1 system. Text messaging and instant messaging are becoming a more common method of communication than the traditional two-way voice telephone call. Pictures and videos from phones and PDAs are being shared instantly with friends and colleagues around the world. Video and text based communications are replacing traditional TTY communications for the deaf and hard of hearing. Automobiles are being outfitted with telematics systems that automatically open up a voice call and provide valuable crash data when a car is involved in an accident. These are all amazing technologies, and citizens can reasonably expect to be able to contact 9-1-1 with technologies they use to communicate every day. Yet, all of these advancements in consumer communications technology have one important characteristic in common:

*today's legacy 9-1-1 system cannot deliver any of this information to 9-1-1 centers [emphasis added]."*¹

Several years ago, Dale Hatfield, former Federal Communications Commission (FCC) Office Chief, described today's 9-1-1 system as "...an analog technology in an overwhelmingly digital world."² This is the reason today's E9-1-1 system cannot handle these new modes of communication and new types of information: the decades-old analog technology is simply too antiquated to do the job.

Understanding this, the Committee determined that it must upgrade Michigan's current E9-1-1 system to modern, digital IP-based technology. An IP-based 9-1-1 system would provide a flexible backbone transport for 9-1-1 with the capability to encompass the existing landline and wireless voice and data, as well as Voice over Internet Protocol (VoIP), telematics, still image and video transmissions, text / data messaging and yet-future communications technologies.

Although development work regarding the technical architecture of NG9-1-1 is still underway, it is timely for the State of Michigan to focus on what it will take to move in that direction. The NG9-1-1 service model anticipates "a system with shared networks, databases and applications in which the communications costs of public safety agencies are shared amongst all participants in the NG9-1-1 system..."³ The United States Department of Transportation (US DOT) has stated that once implemented, NG9-1-1 will enable the following.

- The transfer of 9-1-1 calls between geographically dispersed PSAPs (and from PSAPs to remote public safety dispatch centers) if necessary
- Increased aggregation and sharing of data, resources, procedures and standards to improve emergency response
- Maximized public capital and operating cost savings for emergency communication services
- Increased coordination and partnerships within the emergency response community⁴

Next generation functions that enable the transferring of 9-1-1 calls, the sharing of data and resources, the maximizing of cost savings and the increased coordination and partnerships of the stakeholders involved all stem from a coordinated and interconnected environment that brings with it a host of new institutional and public policy challenges. Current policy—and its related regulation and legislation—reflects the origin of E9-1-1 as a regulated telephone company service where each PSAP or local 9-1-1 system stands alone and where there is little, if any, sharing of information and data beyond the bounds of the individual 9-1-1 system. NG9-1-1 is more than just a swap of one technology for another within the existing telephone company model. NG9-1-1 is no longer the exclusive domain of the telephone company, and PSAPs are no longer islands.

¹ NENA Next Generation Partner Program, "A Policy Maker Blueprint for Transition to the Next Generation 9-1-1 System: Issues and Recommendations for State and Federal Policy Makers to Enable NG9-1-1," September 2008, Page 2.

² Hatfield, Dale N. "A Report on Technical and Operational Issues Impacting the Provision of Wireless Enhanced 911." October 2002, Page ii.

³ National Emergency Number Association Next Generation Partner Program, "Funding 9-1-1 into the Next Generation: An Overview of NG9-1-1 Funding Model Options for Consideration," March 2007, Page 3.

⁴ USDOT. "Next Generation 9-1-1 (NG9-1-1) System Initiative: Concept of Operations." April 2007, Page 12.

Any effort to change the way things are done may be met with concern among local 9-1-1 authorities and PSAPs that the State will take over their 9-1-1 service. That concern may get in the way of effective dialog. It will be necessary to help such critically important stakeholders more clearly understand that NG9-1-1 involves practical partnerships in ways that E9-1-1 did not. Local functions such as staffing, answering calls and dispatching will remain under local control. Functions associated with system interconnection, IP network management, data services and data rights, etc. simply must be managed at a higher level.⁵ It does not detract in any way from how Michigan’s counties do what they do best: answer and respond to 9-1-1 calls. Traditional 9-1-1 service providers—the Local Exchange Carriers (LECs)—may be concerned that they will lose revenue. The states that have launched pilot projects in partnership with their LECs and PSAPs demonstrate the positive benefits of approaching the challenge collaboratively.

The State’s need to understand and prepare to address the policy issues inherent in such a sweeping change was the impetus for this Initial Policy Analysis Report. In it, Kimball provides a high-level, preliminary assessment of the policy, regulatory and statutory issues currently identified by the broader 9-1-1 community and those facing Michigan specifically. That said it is important to keep in mind that that many policy issues—or potential policy issues—cannot be known with certainty at this point in the project. Policy issues will differ based on the approach the State ultimately chooses for the configuration and implementation of its IP-enabled network.

⁵ NENA Next Generation Partner Program. “Next Generation 9-1-1: Responding to an Urgent Need for Change.” February 2006, Page 9

2. METHODS

For the national perspective, Kimball conducted a comprehensive review of source documents published by industry associations and government agencies. Industry associations included the National Emergency Number Association (NENA), the NENA Next Generation Partner Program (NENA NG Partner), the Association of Public-Safety Communications Officials (APCO) and the 9-1-1 Industry Alliance (9IA). Government agencies included other states' 9-1-1 programs, the Federal Communication Commission's (FCC) Network Reliability and Interoperability Council (NRIC), the U.S. Department of Transportation (US DOT) and the Congressional Research Service. Kimball obtained source materials from these entities' Internet Web sites and from our library.

For the Michigan specific perspective, Kimball conducted a thorough review of Chapter 484 MCL, the current tariffs for Verizon and AT&T on file with the Michigan Public Service Commission and all related policies, procedures and administrative rules. In addition, Kimball interviewed the State 9-1-1 program staff and participated in meetings with Michigan telecommunications industry stakeholders.

Kimball drew heavily upon the industry knowledge and experience of the individuals assigned to assist Michigan with this study—individuals who have been “in the trenches” managing and operating 9-1-1 programs at the state and local levels and have helped numerous state-level clients analyze 9-1-1 policy. In addition to state-level experience, Kimball has been intimately involved in the US DOT's NG9-1-1 project, thus providing the State of Michigan with the benefit of their insight into the federal 9-1-1 policy environment that will have an impact on NG9-1-1 implementations nationwide. Finally, members of Kimball's Michigan project team have served, or currently serve, in national leadership capacities, including co-chairing the NENA NG Partner' Regulatory and Legislative Committee, which is tasked with identifying, defining and prioritizing specific policy, legislative and regulatory issues that could impede the implementation of NG9-1-1 and developing proposed actions to resolve them.

Kimball's unique position in the industry allows us to take a broad view of 9-1-1 policy development all across the country. Kimball drew heavily on this experience to provide reality and credibility to our work on behalf of the State of Michigan.

3. NG9-1-1 POLICY ISSUES

3.1 OVERVIEW

In 2008, Congress passed legislation designed to address VoIP telecommunications and 9-1-1 service: *The New and Emerging Technologies 911 Improvement Act of 2008* (NET 911 Improvement Act). Among other things, the new legislation amended the ENHANCE 911 Act of 2004 to include provisions requiring the national 9-1-1 Implementation Coordination Office (ICO)⁶ to develop and report to Congress a "...national plan for migrating to a national IP-enabled emergency network capable of receiving and responding to all citizen-activated emergency communications and improving information sharing among all emergency response entities."⁷ The plan's content is required to address a variety of policy issues, including the following.⁸

- Barriers that must be overcome and funding mechanisms to address those barriers
- Specific mechanisms for ensuring the IP-enabled emergency network is available in every community and is coordinated on a local, regional and statewide basis
- Location technology for nomadic devices and for office buildings and multi-dwelling units
- Recommendations on any legislative changes, including updating definitions, to facilitate a national IP-enabled emergency network
- Solutions for providing access to those with disabilities and the needed steps to implement such solutions
- Regulatory or legislative changes that are necessary to achieve automatic location [of devices used to call 9-1-1]

By this Act, Congress telegraphed its intent to clarify Federal 9-1-1 policy and to ensure that federal laws and regulations facilitate rather than hinder progress toward the implementation of IP-enabled 9-1-1 systems.

Congress' list is similar to the issues identified by the NENA NG Partners are as follows.

- Funding
- State-level 9-1-1 leadership and coordination
- Establishing statewide emergency services IP networks (ESInets)
- Legacy regulation / legislation and tariffs
- Automatic location of 9-1-1 calls
- Confidentiality

⁶ The 2004 Act established a national 9-1-1 Implementation Coordination Office as a joint program of the National Telecommunications and Information Administration (NTIA) in the U.S. Department of Commerce and the National Highway Traffic Safety Administration (NHTSA) in the U.S. Department of Transportation.

⁷ New and Emerging Technologies 911 Improvement Act of 2008, Section 102(d)(1).

⁸ Section 102(d)(2), *ibid*

These are the basic policy issues that each state must address through its legislation and regulations. We have identified particular sub-issues that are particular to the Michigan E9-1-1 program, but they still fall within these basic topical categories. The remainder of this report addresses each item in turn.

It is important to note that, while this report treats the policy issues as though they were entirely separate topics, they are interrelated. It is also important to note that this is an initial report, and the overall NG9-1-1 feasibility study of which it is a part is not yet complete. These policy issues will need to be revisited and refocused once Kimball completes the study and, perhaps, once again after the State of Michigan decides how it wants to proceed with regard to NG9-1-1 implementation. Through this report, the State has taken the first step in coming to an initial understanding the policy, regulatory and legislative issues that need to be considered.

3.2 FUNDING

3.2.1 Overview of the Issue

Most state and local authorities fund 9-1-1 by imposing and collecting surcharges on telecommunications services such as landline and wireless and, increasingly, Voice over IP (VoIP). Each state's statutes define what categories of telecommunications service providers are subject to the surcharge requirement, how surcharges are to be collected and remitted, how the funds are to be distributed and what uses of the funds are permissible.

Funding NG9-1-1 systems will be a challenge for many states since the current funding model is based upon historic regulated landline telephone service. As more consumers abandon their landline services and transition to other forms of communication technologies, overall revenues from current funding models are decreasing. As the NENA NG Partner funding report points out:

“9-1-1 has moved beyond its original fixed wireline circuit switched telephony for devices calling 9-1-1, as well as the underlying technology of the 9-1-1 network. Historically, it was assumed that funding mechanisms for 9-1-1 were to be levied on an access line basis. Only traditional telephone companies would provide 9-1-1 network and database administration services to governmental entities, thereby relying on the fixed location access line to construct 9-1-1 tariffs. These assumptions are no longer valid with the advent of modern wireless and IP-based communications. Funding models need to adapt to the technical realities of today and be flexible enough to accommodate future technology advances.”⁹

The funding challenge is not limited to funding mechanisms. The nature of NG9-1-1 involves shared networks, databases and applications. This gives rise to issues surrounding how or whether to provide stakeholder cost recovery and determining who pays for what.

In addition, the transition period will likely involve operating the legacy system and the NG9-1-1 system in parallel for a time. The funding needs of the transition period will be unique and require careful planning to assure adequate funding throughout the transition. Without adequate planning (and strong

⁹ NENA Next Generation Partner Program, “Funding 9-1-1 Into the Next Generation: An Overview of NG9-1-1 Funding Model Options for Consideration,” March 2007, Page 3.

collaboration and coordination), the length of the transition period will increase; and costs will commensurately increase along with it.

3.2.2 Initial Analysis

3.2.2.1 Surcharges

Many states have modified their existing statutes in an effort to broaden the types of technologies subject to the 9-1-1 fee / surcharge requirement, Michigan among them. In 2007, Michigan amended its 9-1-1 statute to require all communications services that can provide access to 9-1-1 to collect and remit the 9-1-1 surcharge, regardless of technology. This was a significant advancement as it broadened the surcharge base by making it technology neutral, which will help provide a more solid foundation for the future.

Michigan currently has these three statutory funding provisions for 9-1-1: a State “all devices” surcharge, a county “all devices” surcharge and a technical fee (which is wireline based).

Michigan’s State 9-1-1 surcharge is collected by the communication service providers and remitted to the Michigan Department of Treasury (Treasury); a separate fee on pre-paid wireless services is also remitted to the Treasury. The Treasury is responsible for the financial administration of the State’s 9-1-1 program. This includes processing remittances from the communications service providers, depositing them into the Emergency 9-1-1 Fund; distributing the funds to the counties, Local Exchange Carriers (LECs) and the PSAPs as directed by the Committee; and accounting for all transactions from the 9-1-1 Fund.

The State’s 9-1-1 current surcharge is \$0.19 on all communications devices and is distributed as follows.

- 82.5 percent to counties distributed in two manners: 40 percent on an equal share basis and 60 percent on a per capita basis
- 7.75 percent to fund 9-1-1 network costs for delivery of wireless calls to PSAPs
- 6.0 percent to 9-1-1 training program
- 1.87 percent to administer the Act and fund State 9-1-1 Office
- 1.88 percent to the Michigan State Police (MSP) to operate a regional dispatch center that receives and dispatches 9-1-1 calls

The county surcharge is assessed, collected and remitted directly to the county and administered by the county according to the provisions of Public Act 32 of 1986, as amended. Sixty-six counties collect a local 9-1-1 surcharge. The remaining counties fund 9-1-1 operations through general funds or millages¹⁰. County 9-1-1 surcharge rates approved under MPSC Docket U 15489 have been grandfathered under Public Act 379 of 2008. County commissioners can approve rates up to \$0.42 without voter approval and can assess up to \$3.00 with voter approval.

Michigan’s technical charge is unique; to our knowledge, no other state has anything like it. It works this way: within any 9-1-1 service district, LECs assess an emergency telephone technical charge on their subscribers to cover the cost to provide the E9-1-1 network, databases and trunking in that 9-1-1 service

¹⁰ A tax rate on property, expressed in mills per dollar of value of the property.

district. The amount is calculated by dividing the LEC's actual costs by the number of exchange access facilities within the 9-1-1 service district. The LECs bill and keep the technical charge. A CPA firm handles the accounting and conducts a true up at the end of each year. Each provider is responsible for paying the CPA firm for its services.

There is no statutory requirement for the incumbent and competitive LECs to report how much they collect from the technical charge to the State or how much it actually costs them to provide E9-1-1 service. Thus, the State 9-1-1 Committee has no baseline from which to determine whether NG9-1-1 would cost more or less. It will be very difficult to plan and equally difficult to make the case for an investment in NG9-1-1 without a full accounting for what E9-1-1 currently costs and how much revenue the technical charge generates. Interestingly, the Committee also does not know how much it costs the wireless and VoIP telecommunications services to provide E9-1-1, nor does it know how much these companies raise through "self recovery" from their customers. None are required to report that information.

The technical charge will certainly add complexity to funding NG9-1-1 in Michigan. Only three counties have service contracts with one of Michigan's two 9-1-1 service suppliers (AT&T and Verizon). The others follow the process outlined in statute and then request the 9-1-1 service supplier to provide service; the service supplier assesses the technical charge to pay for its portion of the costs. If a county wanted to receive its 9-1-1 service from a competitive service supplier, under current law its ratepayers would still have to pay the technical charge. The reason is simple: the former 9-1-1 service supplier is also a LEC and will still have to perform certain functions such as maintain customer records for the Automatic Location Information (ALI) database and route its customers' 9-1-1 calls to the border of the competitive 9-1-1 network. It, along with all the other incumbent LECs (ILECs) and competitive LECs (CLECs), will assess the technical charge to cover their costs to interconnect with the competitive 9-1-1 service provider's system, maintain the ALI records for their landline customers, etc. This particular situation has already arisen in Michigan, when one county wanted to do just that. The cost was prohibitive, and the county decided to leave 9-1-1 service as it was—with its current 9-1-1 service supplier, the LEC.

3.2.2.2 Shared Systems

NG9-1-1 is not just a one-for-one replacement of the current 9-1-1 technologies with IP 9-1-1 technologies that leaves all the other institutional arrangements as they currently are. NG9-1-1 involves shared networks, shared databases and shared applications. A number of national 9-1-1 industry associations are grappling with how to allocate costs when several parties share system components. The issues for Michigan will depend on how the State decides to provide NG9-1-1 as a matter of public policy. For example, the State could provide a statewide, State-owned IP backbone network for 9-1-1; the State could provide a statewide IP backbone through service contracts with a provider or providers; the State could facilitate the implementation of regional, interconnected IP-enabled backbone systems and manage the interconnections and high-level functions at the State level. If the IP-enabled backbone were used solely for 9-1-1, then the matter would be relatively straightforward. If other State and local government functions were to use the same IP network backbone, allocating proportional costs would be further complicated. If the IP backbone were shared with private sector entities, the cost allocation issues would be extremely complex.

While this discussion relates only to the public policy aspects of cost allocation and funding, we note that there are also technical, regulatory and statutory issues associated with each of these scenarios.

3.2.2.3 Transition Costs

The transition period will likely involve operating the legacy system and the NG9-1-1 system in parallel for a time. The funding needs of the transition period will be unique and require careful planning to assure adequate funding throughout the transition. Without adequate planning (“adequate” implies the existence of strong collaboration and coordination among all stakeholders), the length of the transition period will increase; and costs will commensurately increase along with it.

Although the results of the larger NG9-1-1 feasibility study are pending, we can anticipate the types of policy questions the State of Michigan will need to answer. They include how the State intends to provide statewide NG9-1-1 coverage, e.g., whether by a single, statewide IP network or by facilitating the development of regional interconnected IP networks. Another early policy question is whether the State would use existing networks that the State either owns or has access to or if it would procure facilities from third-party providers. In addition, there is the matter of whether the IP backbone would be shared immediately or whether sharing would be phased in over time.

The transition funding issues will be different depending on how the State approaches this matter. For example, if the State provides a statewide IP backbone and that backbone were used only for 9-1-1 initially, the issue would be only to determine whether to use surcharge revenues to pay the one-time costs associated with the transition, issue a bond, identify an entirely new funding mechanism or some combination of options. The State would address issues associated with expanding use of the IP backbone to include other public safety purposes and entities in a phased approach over time. If the State of Michigan intends to provide an IP backbone that would be shared with other entities immediately, then transition planning would involve not only funding the 9-1-1 portion but also allocating proportional costs to the other users. If the State intends to facilitate the development of regional, interconnected IP-enabled 9-1-1 backbone networks, the questions are similar.

As above, this discussion relates only to the public policy aspects of cost allocation and funding. There are, likewise, technical, regulatory and statutory issues associated with each of these scenarios.

3.2.3 Recommendations

Kimball’s first four recommendations reflect those made by the NENA Next Generation Partners.¹¹ We would also make the point that at least some of the necessary review of existing legislation, and potential proposal of new legislation should occur after the State has selected a NG9-1-1 system design and plan. The reason is that the funding issues may be different.

- Review current funding legislation to
 - Determine how, or whether, it needs to be modified to reflect the convergence and integration of emergency response technology
 - Enable the increased public safety agency interaction made possible by an IP environment and inherent in NG9-1-1
 - Authorize the State to provide an IP backbone network to deliver 9-1-1 calls and information to the entire State

¹¹ NENA Next Generation Partner Program. “A Policy Maker Blueprint for Transition to the Next Generation 9-1-1 System: Issues and Recommendations for State and Federal Policy Makers to Enable NG9-1-1.” September 2008, Page 6 and 7.

- Ensure that planning and funding for emergency communications interoperability reflects next generation emergency communications, including NG9-1-1
- Assure that legislation dealing with technical and operational matters promotes cooperation and coordination, cost sharing, Emergency Service IP Networks (ESInets), including interstate ESInets and NG9-1-1 in general
- Review 9-1-1 definitions and bring them into alignment with next generation concepts and technology

Kimball offers four additional recommendations.

- Following the completion of this NG9-1-1 feasibility study, identify potential stakeholders and bring them to the table to discuss fair and equitable cost-sharing arrangements that would enable all to benefit from the increased capability and level of service made possible by NG9-1-1.
- Consider eliminating the technical charge and let the providers self recover their costs. We note for the record that the State 9-1-1 Committee has previously put this option on the table.¹²
- If eliminating the technical charge is not desirable, at a minimum Kimball recommends that the incumbent and competitive local exchange carriers be required to submit a documented report annually to the Committee disclosing how much it cost them to provide E9-1-1 to each of their counties and how much revenue their technical charge generated in each county.
- Give adequate time to planning for a shared environment

3.3 STATE-LEVEL LEADERSHIP AND COORDINATION

3.3.1 Overview of the Issue

The importance of state-level coordination for 9-1-1 and emergency communications was first expressed in the Wireless Communications and Public Safety Act of 1999.¹³ Congress found that the deployment of efficient, end-to-end emergency services would require the concentrated coordination of public safety efforts, funding sources and communication integration. Congress directed the FCC to encourage “...coordinated statewide deployment plans, through an entity designated by the governor.”¹⁴

The importance of state-level coordination continues to be reinforced in federal legislation and regulation. The ENHANCE 911 Act of 2004 made state-level coordination a specific eligibility requirement for PSAP grant funding. The NET 911 Improvement Act of 2008¹⁵ reinforced this requirement. The associated rules promulgated by the National 9-1-1 ICO establish specific requirements for state plans, and the ICO funded a national project to develop a model state 9-1-1 plan.

¹² PA 249 Final Report, page 5. < http://www.michigan.gov/documents/msp/PA249_of_2006_178037_7.pdf > (March 11, 2009)

¹³ PUBLIC LAW 106-81

¹⁴ Ibid.

¹⁵ PUBLIC LAW 110-283

NG9-1-1 has been referred to as a ‘system of systems’ because of the level of interconnectivity that it requires from local, regional, state and interstate emergency services.¹⁶ The United States Department of Transportation’s (USDOT) vision for NG9-1-1 is that it would eventually be a “nationally interoperable emergency services internetwork.”¹⁷

Achieving statewide NG9-1-1 coverage will require state-level coordination. Aspects such as network and related information delivery functions that are shared by all emergency agencies will need to be coordinated on a statewide, rather than a local, level.¹⁸

As previously noted, local 9-1-1 authorities and PSAPs may be concerned that the state will “take over” their 9-1-1 service. That concern may get in the way of effective dialog. It may be necessary to help such critically important stakeholders more clearly understand the delineation of responsibility in a NG9-1-1 environment. Local functions such as staffing, answering calls and dispatching will remain under local control. Functions associated with interconnection, IP network management, data services and data rights, etc., simply must be managed at a higher level.¹⁹ This does not detract in any way from how Michigan’s counties do business.

3.3.2 Initial Analysis

As previously described, State-level oversight by statute in Michigan is provided by the State 9-1-1 Committee (Committee) within the Michigan State Police (MSP). The MSP is responsible for providing staff assistance to the Committee as necessary to carry out the committee’s duties, which it accomplishes through the State 9-1-1 Administrator’s Office located in the MSP’s Administrative Services Bureau (ASB). The Committee has authority to recommend technical and operational standards for PSAPs, to recommend model 9-1-1 systems and to provide assistance for the design, implementation and operation of those systems. Rulemaking authority rests with the Michigan Public Service Commission (MPSC); although, as previously noted, it has yet to adopt the much-needed rules.

While the State-level oversight that the Committee enjoys is more centralized than its counterparts in some other states, the locus of rulemaking authority is a concern. NG9-1-1 is not a “local exchange service” in the manner that E9-1-1 has been. As the nature of 9-1-1 service evolves away from the regulated telephone industry so, too, must the regulatory environment evolve to reflect the new reality.

The Committee’s statutory authority is limited to developing and recommending statewide standards, making recommendations for emergency telephone service, making recommendations for counties’ 9-1-1 plans, providing technical assistance for the implementation of county 9-1-1 systems and overseeing the distribution and use of State and county 9-1-1 funds.

¹⁶ USDOT. “Next Generation 9-1-1 (NG9-1-1) System Initiative: Concept of Operations.” Intelligent Transportation Systems. April 2007, page 12. <http://www.its.dot.gov/ng911/ng911_pubs.htm> (April 19, 2008).

¹⁷ Ibid.

¹⁸ NENA Next Generation Partner Program. “A Policy Maker Blueprint for Transition to the Next Generation 9-1-1 System: Issues and Recommendations for State and Federal Policy Makers to Enable NG9-1-1.” September 2008, Page 5.

¹⁹ NENA Next Generation Partner Program. “Next Generation 9-1-1: Responding to an Urgent Need for Change.” February 2006, Page 9.

Kimball's initial analysis is that Michigan's current statute does not authorize the State to provide a statewide 9-1-1 system. Current statute establishes 9-1-1 service delivery (staffing, call answering, dispatching and emergency response) at the county or 9-1-1 district level. All associated provisions (funding, governance and the system's technological components) reflect that structure. If the State were to decide to provide an IP network for 9-1-1, the statute would need to be changed to authorize that change in scope. The Committee's role is advisory, so even the ability to simply coordinate the statewide planning and migration of county-based systems to ultimately achieve a statewide, interconnected IP network appears not to exist. The E9-1-1 program office could (and perhaps should) fill that role, but any effort to expand its authority would likely be met with concern or even outright resistance on the part of local government, PSAPs and 9-1-1 service districts.

Kimball's basis for the above statement is our industry knowledge of what other states have experienced when trying to modify their 9-1-1 legislation in order to meet increasingly complex service needs. The most effective way to avoid or mitigate this potential roadblock is to provide a mechanism for stakeholder participation in decisions that affect them and to do everything possible to communicate frequently and openly with all concerned. The State 9-1-1 Committee effectively fulfills this role and may need to increase contact with its constituents during the planning and implementation process. Ultimately, the Committee must make decisions based on what is the best public policy, not on individual interests.

3.3.3 Recommendations

Kimball recommends that the statute be amended to expand the Committee's authority or the authority of the E9-1-1 program office. The nature of the amendments needed would depend on whether the State provides a statewide IP backbone or simply coordinates county planning and implementation to achieve statewide and interstate interconnection. The nature of the amendments needed would also depend on what is politically possible or desirable.

At a minimum, Kimball recommends that the State 9-1-1 Committee or the E9-1-1 program office be given direct rulemaking authority. It is essential that the entity most knowledgeable about the larger issues facing 9-1-1 and the needs of public safety have appropriate authority to support, facilitate and lead the way forward.

Additionally, we recommend the E9-1-1 program and the Committee be given specific authority for statewide planning; coordination and implementation of E9-1-1 and NG9-1-1, including the ability to ensure that all PSAPs are equipped with the necessary technologies, interstate coordination and interconnection.

Regardless of whether the IP backbone (and related services) is a statewide, State-owned network or whether statewide service is provided by interconnecting several local or regional networks, the Committee or the E9-1-1 program office should have statutory authority to coordinate the management of technical interfaces, the requirements for IP network access and the security and maintenance of the system.

3.4 ESTABLISHING STATEWIDE EMERGENCY SERVICE IP NETWORKS (ESINETS)

3.4.1 Overview of the Issue

The NENA NG Partner Program has published a policy brief on this topic²⁰ that represents the most comprehensive analysis of this issue to date. The Texas Commission on Statewide Emergency Communications drove the development of this issue. Kimball offers the following synopsis.

ESInets are essential to the NG9-1-1 and next generation emergency communications architecture. They provide the physical backbone and also host (or provide access to) a variety of application layer²¹ services that support interoperability among the diverse regional / local networks and agency applications. These include, for example, standardized core services such as GIS-based directories of authorized organizations and resources and access control / identity management for implementation of information-sharing policies. ESInets would enable all authorized organizations to share information based on their own data-sharing policies.

The nature of the NG9-1-1 system architecture reveals the need for statewide management and coordination of ESInets. This can be accomplished in one of two ways: the State may build and maintain a single statewide ESInet and thereby leverage the potential for increased efficiencies and economies of scale; or, ESInets may be deployed at the 9-1-1 service district or county level. Since statewide and interstate connectivity will be very difficult, if not impossible, to achieve at the county or 9-1-1 service district level, the NENA NG Partner Program recommends that a state-level entity be made responsible for coordinating and managing the interconnections and, subsequently, the interconnected statewide ESInet. This parallels Kimball's earlier recommendations concerning the ability of the State to provide statewide coordination and leadership on a variety of matters relating to NG9-1-1, including interconnection.

3.4.2 Initial Analysis

The US DOT's Proof of Concept Test Report notes that current 9-1-1 authority, decision-making and funding occurs largely at a local or county level. This is the case in Michigan as in most of the nation. Relying solely upon the local / county model will hamper the necessary intra and interstate coordination and, more importantly, will seriously interfere with achieving the interoperability potential of IP-based networks in general and NG9-1-1 in particular. It is possible that it could be done this way, but it would be extremely challenging and would greatly increase the amount of time it will take to achieve. The report put it this way:

²⁰ NENA Next Generation Partner Program. "A Policy Maker Blueprint for Transition to the Next Generation 9-1-1 System: Issues and Recommendations for State and Federal Policy Makers to Enable NG9-1-1." September 2008, Page 8 and 9.

²¹ The "application layer" is the seventh of the seven layers of a computer network model defined in the Open Systems Interconnection Basic Reference Model (OSI Reference Model or OSI Model). The OSI Model is an abstract description for layered communications and computer network protocol design. It was developed as part of the Open Systems Interconnection (OSI) initiative. See Wikipedia < http://en.wikipedia.org/wiki/OSI_model > (accessed December 31, 2008)

“Using standards-based technology, local PSAPs will be able to interoperate with surrounding counties *if they coordinate efforts* [emphasis added]. Those counties will be able to interoperate statewide, and all states will be able to interoperate at a national level, *assuming the necessary coordination* [emphasis added]. Accomplishing this increased coordination, given the divergent 9-1-1 funding models, will be difficult; however, given the flexibility of the technology, it is still possible.”²²

Engagement among all of Michigan’s stakeholders is vitally important to the success of this feasibility study. The State 9-1-1 Administrator’s office, in conjunction with the Committee, provides the essential framework for coordinating stakeholder engagement and (with modification to existing statute) for any potential build-out of statewide NG9-1-1.

3.4.3 Recommendations

The role of the Legislature cannot be underestimated in setting the tone and creating the environment that will foster sustained collaboration among the stakeholders. It should do the following.

- Commit to the development and deployment of interoperable statewide ESInets as a fundamental 9-1-1 and emergency communications policy objective
- Encourage State, regional and local 9-1-1 and emergency services authorities to work cooperatively toward planning and establishing a statewide ESInet(s)
- Review existing legislation and regulations and resolve anything that would inhibit, prohibit or fail to authorize the establishment of statewide ESInets and NG9-1-1²³
- Affirmatively authorize and fund statewide ESInets and the essential interoperability services hosted on, or accessed by, them
- Promote the sharing of infrastructure with other (non-public safety) governmental entities but ensure priority access for 9-1-1 and other emergency services

It is important to keep in mind that a statewide ESInet would not change the basic model for 9-1-1 call handling, dispatching and the provision of emergency services, which would remain local functions. This should help allay the concern that the State intends to take over 9-1-1 service. The Committee has done well to include a significant stakeholder-involvement component in its overall NG9-1-1 feasibility study.

What a statewide ESInet would do is enable stakeholders to leverage economies of scale of a common infrastructure, thereby maximizing the potential for increased capability and level of service it would make possible. Including all stakeholders at the table would assure that everyone has his or her say and is heard. Doing this earlier rather than later will go a long way to securing their commitment to a successful outcome.

²² U.S. Department of Transportation. “NG9-1-1 Proof of Concept Test Report.” September 2008, Page 36

²³ These issues include, but are not limited to, FCC and spectrum matters, law enforcement rules that prohibit interconnection with non-law enforcement agencies and legacy telecommunications tariffs that make the provision of 9-1-1 services the exclusive domain of telephone companies.

3.5 LEGACY REGULATIONS, LEGISLATION AND TARIFFS

3.5.1 Overview of the Issue

An IP environment for 9-1-1 opens the way for new competitive 9-1-1 service suppliers and alternative competitive options. This will most certainly involve new technologies and business arrangements that current laws, regulations and tariffs did not foresee.²⁴ Many 9-1-1 authorities will seize the opportunity for technological advancement and will likely encounter obstacles in existing regulations, laws and tariffs—indeed, there is already ample evidence of this in Michigan and elsewhere. Others will remain with their current arrangements for some time to come. We know that an operational NG9-1-1 system will not be deployed all at once, and Michigan’s stated preference is for a phased approach. Thus, it will be necessary to provide interoperability between legacy 9-1-1 systems and those that have already transitioned to an IP platform and are in the process of migrating to full NG9-1-1. Legislation, regulation and tariffs need to accommodate the complexities of this transitional period.

3.5.2 Initial Analysis

Michigan’s current statutes, regulations and tariffs reflect the legacy environment. As noted previously, Michigan has begun the process of broadening its funding legislation to be more reflective of modern communications options available to consumers. Nevertheless, there is more to be done. There is no clear policy in the existing framework supporting competitive 9-1-1 service suppliers. The 9-1-1 technologies included in the existing framework are those associated with the legacy, analog telephone environment (e.g., selective routers, ALI database, PSAP functionality, network infrastructure). Kimball’s initial conclusion is that Michigan’s current laws, regulations and tariffs need to be overhauled in order to pave the way for the competitively and technologically neutral environment that is necessary to establish an IP backbone for NG9-1-1.

Potential roadblocks in Michigan’s 9-1-1 statutes include definitions that describe E9-1-1 only in legacy terms, provisions that limit E9-1-1 system to the county or 9-1-1 district level, funding mechanisms that would appear to prevent competition. Examples include the following.

- Automatic Location Identification (ALI) and Automatic Number Identification (ANI) are base features associated with landline voice telephone service MCL 484.1102 (a) and (b)
- MCL 484.1201 authorizes the implementation of E9-1-1 service only by counties
- MCL 484.1205 provides that a 9-1-1 system shall process all 9-1-1 calls from “telephones” and does not provide for 9-1-1 calls from other types of devices
- The provisions in MCL 484.1401 for an emergency telephone technical charge appear to us to be a roadblock to competition in the provision of E9-1-1 services

Another potential roadblock is the State 9-1-1 Committee’s lack of rulemaking and enforcement authority.

²⁴ NENA Next Generation Partner Program. “A Policy Maker Blueprint for Transition to the Next Generation 9-1-1 System: Issues and Recommendations for State and Federal Policy Makers to Enable NG9-1-1.” September 2008, Page 10.

Potential roadblocks in Michigan's 9-1-1 service suppliers' tariffs include definitions that describe E9-1-1 system components and functions in legacy terms and do not provide for IP technologies. Examples include the following.

- Definitions of enhanced 9-1-1 are limited to features associated with traditional landline emergency telephone service
- Descriptions of the E9-1-1 network reflect the current landline 9-1-1 system, which is based on circuit switched technology

We note that the entire regulatory structure seems to place "ownership" of the Master Street Address Guide (MSAG) with the telephone company, even though county ratepayers have paid for it through the technical charge. That may make it more difficult for 9-1-1 authorities to move toward a spatial representation of streets, addresses and emergency service response jurisdictions. In addition, some 9-1-1 tariffs expressly prohibit their PSAPs from interconnecting call-handling equipment (if the service supplier provides it) with someone else's IP network.

Other states have faced the challenge of needing to maintain and pay for the legacy service supplier's tandem switches after the IP migration is complete. Companies may make the argument that their tandem switches are still necessary for aggregating their customers' 9-1-1 calls and delivering them to the IP backbone's router.

As long as landline customers exist, the 9-1-1 system, regardless of who provides it and whether it is IP or some other technology, will need support access to the customer records of landline telephone companies; and the landline telephone companies will need to maintain those records just as they do now. The companies' charge for the costs of such data maintenance process is tarified.

Finally, if the State were to decide to maintain the status quo with the current service supplier arrangements, true NG9-1-1 might not ever be achieved, as LECs do not typically allow the type of sharing or interconnectivity envisioned for NG9-1-1.

3.5.3 Recommendations

Kimball's initial recommendation is for the State 9-1-1 Administrator, the State 9-1-1 Committee and the MPSC to undertake a close examination of 9-1-1 tariffs that does the following.

- Mention or require the use of specific technologies for 9-1-1 service suppliers
- Prevent competition
- Hinder or prohibit 9-1-1 and emergency responders from sharing 9-1-1 information to facilitate the response to an emergency
- Are bundled or, if unbundled are price prohibitive
- Specify standards that imply or are limited to legacy service suppliers and legacy service
- Prohibit or hinder a PSAP from connecting its CPE with an IP network provided by the State, its agent or a competitive service supplier
- Make the 9-1-1 service provider the owner of the MSAG

We also recommend that the State examine parallel provisions in statute or regulation that are the basis for the tariff structure, and remove those barriers.

3.6 CONFIDENTIALITY

3.6.1 Overview of the Issue

The confidentiality of information related to 9-1-1 calls²⁵ is a much larger issue in an NG9-1-1 environment than it is in today's E9-1-1 environment. Currently, E9-1-1 systems are dedicated, closed, single-purpose systems; and there is not a lot of information currently delivered with a 9-1-1 call.

Generally, PSAPs receive only voice, a call-back number known as Automatic Number Identification (ANI) and the street address or estimated latitude / longitude of the call, known as Automatic Location Identification (ALI). The record of a 9-1-1 call, including the voice recording, customer name and location information, and other information that indicates whether the call is coming from a residence, business, pay phone, etc., are generally stored or archived at a single location: the PSAP that handled the call.

NG9-1-1 systems will not be dedicated, closed, single-purpose systems. They will be shared systems. NG9-1-1 systems will not receive and process the limited amount and type of information available today; there will be more information and different information provided in different formats (e.g., video, still image, text message, video relay). NG9-1-1 involves the capability to seamlessly share data among PSAPs and other entities involved in the response to an emergency. Finally, NG9-1-1 systems will not likely maintain the record of a call at the PSAP, since data is likely to be contained in shared databases with data residing in the network.

3.6.2 Initial Analysis

Our analysis of Michigan's situation is simple: Michigan's confidentiality, retention and disclosure laws do not provide for this scenario. Neither does the 9-1-1 service suppliers' tariffs, which are framed within Michigan's existing E9-1-1 enabling legislation.

Section 484.1317 of Michigan's E9-1-1 enabling legislation is a good example. It provides for the use of name, address and telephone number information, which is about the extent of information provided with a 9-1-1 call for landline and, by extrapolation, its counterpart for wireless and VoIP. Michigan's statute did not envision the possibility that the data associated with a 9-1-1 call could be video and still images or text messages.

Likewise, the law did not envision the possibility that data could be seamlessly transferred or shared with another entity outside the PSAP. In the interest of improving and strengthening emergency response in a

²⁵ In the NENA NG Partners Policy Brief on this topic, the term 9-1-1 emergency "call" refers to any real-time communication—voice, text or video and related data. The term also includes non-human-initiated automatic event alerts, such as alarms, telematics, or sensor data, which may also include real-time voice, text or video communications to a PSAP or other emergency response organizations. This reflects the definition applied by the USDOT through its NG9-1-1 project.

post 9-1-1 era, our emergency communications systems (including 9-1-1) must be able to have this functionality. Current tariffs appear to prohibit this, and we interpret Michigan’s enabling legislation as also prohibiting the sharing and transfer of data.

3.6.3 Recommendations

Kimball’s initial recommendation is to commence the point-by-point review of existing legislation, regulations and tariffs as soon as possible to identify specific provisions that must change.

3.7 AUTOMATIC LOCATION

3.7.1 Overview of the Issue

The success of E9-1-1 in saving lives and property amply illustrates the importance of accurate automatic location of a 9-1-1 call because that is the basis of getting that call routed to the appropriate PSAP and getting the appropriate emergency response dispatched. Most of us have heard horrific stories on the evening news about cellular callers who could not be found—and who lost their lives as a result. This should remind us that automatic location does not happen automatically. If laws and regulations do not require it, new technologies capable of calling 9-1-1 may not provide automatic location, with tragic results.

3.7.2 Initial Analysis

The NENA Next Generation Partners makes the cogent point: “It must be a fundamental policy objective to ensure all communications devices capable of accessing 9-1-1, or those in which the customer reasonably expects to be able to do so, can be automatically and accurately located.”²⁶ We could not have said it better.

Most of the work will fall to Standards Development Organizations (SDOs) and the national industry associations to identify the technological requirements. Most of the work on the public policy side will fall to the federal government. The national 9-1-1 office, for example, is required to “...analyze efforts to provide automatic location for enhanced 9-1-1 services and provide recommendations on regulatory or legislative changes that are necessary to achieve automatic location for enhanced 9-1-1 services.”²⁷ The FCC’s role is most critical to ensuring that the requirement applies to new and emerging technologies and does not continue to be the “post-market afterthought”²⁸ that is has been to date.

There is a role for the State of Michigan, particularly its 9-1-1 Committee, its Legislature and its Public Service Commission. These policymakers can work together to create a regulatory framework such that “automatic location such that general 9-1-1 requirements, like automatic location, are applicable across technologies where the public would have a reasonable expectation of 9-1-1 call delivery.”²⁹ The

²⁶ NENA Next Generation Partner Program. “Addressing Gaps in the Automatic Location of 9-1-1 Calls for Current and Emerging Devices and Services for 9-1-1 calls” Final Draft Pending Approval. December 2008, Page 1.

²⁷ NET 911 Improvement Act of 2008, Section 102 (2)(J)

²⁸ Ibid, page 2.

²⁹ Ibid, page 3.

Michigan Legislature has already taken a step in this direction with regard to funding for 9-1-1 when it provided a new definition for “communications service.” The policy was that any device or service capable of accessing 9-1-1 should pay the surcharge. It logically follows that the consumers who are paying the surcharge should also be entitled to the same level of service that landline and cellular users enjoy, like being able to be located in an emergency.

3.7.3 Recommendations

We recommend that the State review its definition of automatic location, de-link it from the current technology paradigm in which it is embedded and participate in federal policy initiatives.

APPENDIX F – NETWORK MANAGEMENT GUIDELINES

Performance Management - Performance management will measure the variables that affect network performance. A reactive performance monitoring system with user-defined thresholds that meet the service levels defined. When thresholds are not met, network performance reports describing corrective action should be required on a monthly basis. Performance management will also include monitoring of servers and databases associated with the system.

Configuration Management - Configuration management will monitor the IP-Enabled network system configuration. Changes in configuration can cause network outage situations and poor network performance. The configuration management process should store copies of the various hardware and software configurations in place and track network-affecting changes. Configuration management will also include tracking of application changes that could also affect system performance.

Configuration Restoration - If changes have an adverse impact on public safety grade standards, then the provider must initiate immediate corrective action and restore the previous working configurations.

Fault Management – Fault management will detect, log, and notify of IP-Enabled network problems. If the failure immediately corrects itself, notification is not required, but the event should be logged and reported.

Root Cause Analysis (RCA) – For major outages, the network provider should provide a RCA within five business days; and for minor outages will provide an RCA upon request.

Security Management – Security management must control access to network resources according to public safety network security guidelines to prevent sabotage (intentionally or unintentionally) and compromise sensitive information. Security management must use public safety network security standards to monitor users logging into the network resources and refuse access to those who enter inappropriate access codes. The IP-Enabled network should support standard security policies that may include the use of anti-virus software, VLANs, VPNs, and secure sockets layer protocols. All servers on the network will also be included in security management.

Physical Security – Network hardware and software must reside in a secure area that complies with industry standard physical security policies. This includes all servers accessed by this network.

Hardware Maintenance–Hardware components used in the network require 24/7 hardware maintenance. Available spares should be identified for each location and component. This applies to network elements and servers on the network.

Preventative Maintenance–The provider should include preventative maintenance activities that will be included as part of a maintenance contract. This should address how preventative maintenance is handled, as well as the frequency of preventative maintenance activities. The provider should use support logs to drive the development of solutions to recurring issues and follow industry best practices.

Scheduled Maintenance–Scheduled maintenance, including upgrades to the system, must be coordinated in advance and conducted in a manner that does not interrupt operations at more than two remote or one-core location locations simultaneously. Scheduled maintenance includes all services that may cause downtime to a end site including application upgrades. The network provider should make all attempts to ensure that a remote location and its designated back up are not affected at the same time.

Network security management is a process within network operations and management. The security process is to implement and enforce network security policies and procedures to protect network infrastructure from unauthorized access. Internal security audits, authentication testing and network monitoring are a requirement to facilitate a secure network. The IP network should support standard security policies which may include the use of Virtual Local Area Networks (VLANs), VPNs and secure sockets layer protocols.

Performance management measures and makes available various aspects of network performance so that inter-network performance can be maintained. These performance variables affect network throughput.

APPENDIX G – BUDGETARY COST ESTIMATES: STATEWIDE SYSTEM

	2010	2011	2012	2013	2014	2015	2016
Call Access Services Non-Recurring Costs	\$0	\$1,200,000	\$0	\$0	\$0	\$0	\$0
Call Access Services Recurring Costs	\$0	\$685,200	\$685,200	\$685,200	\$685,200	\$685,200	\$685,200
Core Connections Non-Recurring Costs	\$0	\$12,000,000	\$0	\$0	\$0	\$0	\$0
Core Connections Recurring Costs	\$0	\$3,077,280	\$3,077,280	\$3,077,280	\$3,077,280	\$3,077,280	\$3,077,280
PSAP Connections Non-Recurring Costs	\$0	\$2,166,667	\$2,166,667	\$2,166,667	\$0	\$0	\$0
PSAP Connections Recurring Costs	\$0	\$2,344,000	\$4,709,600	\$7,711,800	\$7,711,800	\$7,711,800	\$7,711,800
Total Non-Recurring Costs	\$0	\$15,366,667	\$2,166,667	\$2,166,667	\$0	\$0	\$0
Total Recurring Costs	\$0	\$6,106,480	\$8,472,080	\$11,474,280	\$11,474,280	\$11,474,280	\$11,474,280
TOTAL	\$0	\$21,473,147	\$10,638,747	\$13,640,947	\$11,474,280	\$11,474,280	\$11,474,280

APPENDIX H – BUDGETARY COST ESTIMATES: REGIONAL SYSTEM

	2010	2011	2012	2013	2014	2015	2016
Call Access Services Non-Recurring Costs	\$0	\$2,900,000	\$0	\$0	\$0	\$0	\$0
Call Access Services Recurring Costs	\$0	\$1,776,000	\$1,776,000	\$1,776,000	\$1,776,000	\$1,776,000	\$1,776,000
Core Connections Non-Recurring Costs	\$0	\$24,500,000	\$0	\$0	\$0	\$0	\$0
Core Connections Recurring Costs	\$0	\$7,609,440	\$7,609,440	\$7,609,440	\$7,609,440	\$7,609,440	\$7,609,440
PSAP Connections Non-Recurring Costs	\$0	\$3,833,333	\$3,833,333	\$3,833,333	\$0	\$0	\$0
PSAP Connections Recurring Costs	\$0	\$2,344,000	\$4,709,600	\$7,711,800	\$7,711,800	\$7,711,800	\$7,711,800
Total Non-Recurring Costs	\$0	\$31,233,333	\$3,833,333	\$3,833,333	\$0	\$0	\$0
Total Recurring Costs	\$0	\$11,729,440	\$14,095,040	\$17,097,240	\$17,097,240	\$17,097,240	\$17,097,240
TOTAL	\$0	\$42,962,773	\$17,928,373	\$20,930,573	\$17,097,240	\$17,097,240	\$17,097,240

PSAP Connections Non-Recurring Costs			\$0	\$3,833,333	\$3,833,333	\$3,833,333	\$0	\$0	\$0
Item	Description	Assumptions	2010	2011	2012	2013	2014	2015	2016
PSAP Workstations	Workstation Hardware	3,500,000		1,166,667	1,166,667	1,166,667			
PSAP Workstations	Workstation Software	2,500,000		833,333	833,333	833,333			
PSAP Workstations	Installation/Professional Services	5,500,000		1,833,333	1,833,333	1,833,333			
PSAP Connections Recurring Costs			\$0	\$2,344,000	\$4,709,600	\$7,711,800	\$7,711,800	\$7,711,800	\$7,711,800
Item	Description	Assumptions	2010	2011	2012	2013	2014	2015	2016
DS-1 PSAP	Connection to an estimated 181 individual PSAPs. Each will have two DS-1. These provide connectivity between neighboring PSAPs for redundancy.	362 @ 900		1,166,400	2,354,400	3,909,600	3,909,600	3,909,600	3,909,600
DS-1 PSAP Redundancy		90 @ 700		226,800	453,600	756,000	756,000	756,000	756,000
End Site Router	24 Ports with POE	181 @ 200		129,600	259,200	434,400	434,400	434,400	434,400
End Site Firewall	Managed Firewall for each end site with 48 port switch	181 @ 650		421,200	842,400	1,411,800	1,411,800	1,411,800	1,411,800
Site Maintenance	Maintenance on 181 sites	100,000/month		400,000	800,000	1,200,000	1,200,000	1,200,000	1,200,000

ADDENDA

ADDENDUM 1

**Addendum to the Next Generation 9-1-1 Feasibility Study Report
Submitted to the state of Michigan**

IP Network Activities in Michigan

IP network activities in Michigan have the potential to benefit the network proposed in the Next Generation 9-1-1 Feasibility Study Report that was submitted by L.R. Kimball to the state of Michigan. IP network activities are in various stages of completion throughout the State. Existing IP-enabled networks, planned IP-enabled networks, and those that are being built all pose opportunities for interconnection to the proposed network.

Some public safety related IP network activities are taking place throughout the State:

- As of September 2009 the counties of Clinton, Eaton, Ingham and Livingston were in talks to share the cost of IP technologies to update their 9-1-1 phone systems and develop virtual backup capabilities. The counties are working collaboratively in order to reduce costs and provide for interconnectivity between counties.
- In 2006, Washtenaw County began to build a countywide wireless network to support economic development, improve educational opportunities and advance public safety services.
- Oakland County has a fiber optic network (OAKNet) that connects all County and local agencies to the County network and the Information Technology Building. OAKNet is used to transmit data, video and potentially voice communications. A countywide wireless project is also underway with a running pilot program, but the County delayed the expansion of the network throughout its jurisdiction in 2008.

Other non public safety related IP network activities also occur within the State and are listed below in an effort to highlight existing infrastructure and possibilities for interconnection:

- The city of Southfield has a fiber optic system, providing the foundation for the city's yet-to-come voice and data network and has implemented a Voice over IP (VOIP) network.
- The City of Grand Haven has a city-wide wireless internet service that is designed to work throughout the city and up to 15 miles (24 km) offshore for boaters.
- Macomb County has a broadband infrastructure project that resulted in the construction of a private fiber optic network by Michigan Lightwave Corporation as an alternative provider of dark fiber for lease.
- Merit Network Inc., a non-profit corporation governed by Michigan's public universities, partnered with the Ohio Supercomputer Center in 2006 to enhance regional optical networks in the Midwest.
- Livingston County began a countywide wireless network project, but is currently on hold due to the economic climate.

ADDENDUM 2

MICHIGAN IP FEASIBILITY STUDY QUESTIONS

L.R. Kimball was hired by the State of Michigan to conduct a feasibility study for the State 9-1-1 Committee (SNC). The purpose of the study was to provide information concerning opportunities, available technology, optional models, and high-level budgetary pricing based on the models. We used information gathered through surveys at the PSAP level, informational sessions with communications providers from across the state, and information gathered from working with multiple states and localities. We did not design the final system for Michigan because that would be premature. The information in this report is designed to give the SNC information that will assist them and the State with the next course of action relative to NG9-1-1. Below are a number of important, and some quite specific, questions. We answered all of them to the best of our ability. However, some will not be answered at the level that the questions were asked because we did not have all of the information required to answer. We may not have the information because the focus of study was to provide the SNC with recommendations on the policy, fiscal, technical and operational aspects of NG9-1-1, and not to design and engineer a system.

Intrado asked the following questions:

1. Given the premises of NG9-1-1, redundancy/no single point of failure, does L.R. Kimball recommend against the LECs using the Selective Router as an aggregation point for wireline 9-1-1 calls prior to delivery to the NG9-1-1 Service Provider(s)?

L.R. Kimball refers to the NG9-1-1 DOT project documentation as well as the NENA i3. For the most part, these documents are not directed at the call origination network. It would be preferable to receive these calls in a native i3 format, but the SNC and state have limited control over the specific devices that a LEC may use to perform its functions. It may be necessary to continue with a Selective Router for some time to ensure that the call is delivered from a legacy 9-1-1 network. The SNC and the MPSC should prepare to work closely together to address any issues that arise.

2. Will the "electronic inventory" of PSAP information be made available to the NG9-1-1 Service Provider?
The information is the property of the Michigan State Police and it is their determination on the availability of the data.
3. Is wireless (i.e., microwave) an option for 9-1-1 call delivery to PSAPs from the NG9-1-1 Service Provider?

At a high level, it is expected that if the service provider can meet the desired levels of service as described by the i3 documentation and any state requirements including all features and functions therein, it may be an option.

4. Why does L.R. Kimball recommend keeping the "Technical charge"? I understand this is equivalent to "Bill and Keep" which, as current legislation stands, would continue to provide revenue to the LEC even if they were not the NG9-1-1 Service Provider.

The current technical charge may be a mechanism for the LECs to make network changes that allow them to deliver calls to the NG9-1-1 system in a native i3 or IP format as directed by the State or NG9-1-1 System Authority. This may help to speed the conversion of legacy systems to the NG9-1-1 system reducing the number and time that some callers will not have access to the added features on NG9-1-1.

MICHIGAN IP FEASIBILITY STUDY QUESTIONS

We know there will be a transition period that includes operating the current systems and the new IP based system or systems in parallel for a time and the technical charge could help cover some of the dual costs.

At a high level and without a final design or a specific approved plan by the SNC, it would be premature of L.R. Kimball to say with certainty that current costs will be eliminated, some may be reduced, and some may be shifted from the service suppliers to the State or to local government. The existing technical charge mechanism for annually adjusting the rate based on actual costs could provide the mechanism for making adjustments based on costs that are eliminated or that shift as the migration unfolds. Another option may be to identify those costs that are considered Common Network Costs as defined in Michigan's 9-1-1 enabling legislation and establish a mechanism for carriers to recover those costs.

5. Do the ongoing annual costs include CPE as a service? Or are the CPE expenditures a onetime upfront cost and the annual ongoing costs just for network and network services (for example, MPLS and ALI)?

Yes, budgetary CPE maintenance costs are included. L.R. Kimball developed budgetary numbers that assumed purchasing and installing the CPE, upfront network charges, all software purchases, and all installation charges. Annual reoccurring costs were calculated assuming a managed IP redundant network and maintenance on hardware and software. This is only one option available to the state.

6. Given the various stages CPE vendors are likely to be in developing a NG9-1-1 (IP) interface, do the costs include money set aside for upgrades beyond the initial implementation timeframe?

L.R. Kimball's budgetary costs included CPE assuming current rates, and the various vendors' public statements that their systems will be NG9-1-1 capable. The basic functions of an NG9-1-1 system are expected to be in the CPE, but the final functional and technical requirements will need to be written. Future upgrades are expected to be included in the maintenance costs, again based on public statements by several CPE vendors that have stated that their products will be maintained for full NG9-1-1 capabilities as they are developed by the standards developers. Hosted CPE exists today which could be placed across the whole state.

AT&T asked the following questions:

1. During the presentation, the following states, Florida, Texas, Indiana, Vermont and Tennessee were names as "states progressing forward with the authority to establish, enforce, operate independently and fund with accountability". Is there any brief documentation available that provides any real-time data for those states?

L.R. Kimball referenced those states for informational purposes only. Any real time documentation for those states is only available from the respective State and may be located on their individual websites.

2. Do any of them have an operational system that encompasses ALL call delivery over a Next Gen or IP network (we know Indiana has a parallel network for wireless) or are they in various states of planning and/or testing only?

MICHIGAN IP FEASIBILITY STUDY QUESTIONS

NG9-1-1 includes not only an IP network but applications that ride on that network, some of which do not yet exist. Several states or regions are using somewhat of a hybrid approach using an IP network to transport legacy calls; nevertheless the calls are still initially legacy. These States are investigating, planning or testing at this point. Most of the states mentioned started right where Michigan is today, with a high Level report intended to help them make the most appropriate decision on how and when to move toward NG9-1-1.

3. It was also stated Washington and Arizona are pilot states with IP projects underway. Same as above.

L.R. Kimball attempted to provide real life examples during the course of our presentation. There are many states moving toward NG9-1-1 in the most appropriate fashion for them. Some states have already chosen their solution and are proceeding in a phased approach starting with a proof of concept or first office application. Those we named in response to questions from the audience during the presentation were offered for informational purposes only. NENA maintains a list of IP projects, which is reasonably current. See <http://www.nena.org/ng911-project> for a link to the list.

4. The costs included in the report include network and CPE. Of the projections, do we know what % is network and what % is CPE? Would network only options be a viable solution? Is the assumption the database and management or ESINets are part of the estimated network costs?

Network costs over 5 years equate to approximately 60%.

CPE costs over 5 years equate to approximately 40%. Spreadsheets in Appendices G and H of the report break out costs by years.

Network based options are a viable solution.

Kimball did assume that database and management of ESINets are a part of the network costs.

5. It states the use of the current State of Michigan network would decrease the potential network costs, though no figure provided. Is there any estimation of the cost savings?

It would be premature in a high level document such as this to provide an estimate. Using the current State of Michigan network could provide economies of scale by sharing network resources. This network would most likely need to be enhanced to provide a public safety level of service.

6. Continued use of the technical charge as it exists today should not be an option, unless the charge is imposed on all devices/users.

L.R. Kimball's recommendation was to retain the technical surcharge currently in place. However, other options exist such as a dedicated fee structures like flat fees on service, percentage fees on service and surcharges on devices. Hybrids of dedicated fee structures, taxes on connectivity and state sponsored funding are other options.

7. Rulemaking to SNC or the 911 State office. Neither the SNC nor the 911 State office have the required technical expertise to manage a statewide IP network.

L.R. Kimball considers this a statement that does not require a response.

8. Reductions and re evaluation of the SNC membership/mission does need to be addressed. (Would that data be included in the progressive states model?)

MICHIGAN IP FEASIBILITY STUDY QUESTIONS

There are some general guidelines included in the report, but the final make up and roles of the SNC should be developed in a cooperative process with all stakeholders. We are not certain we understand what was meant by “the progressive states model.”

9. What exactly is the local control? What will be managed by the state or prime contractor and what will the municipalities have authority over?

The PSAPs will continue to have control over PSAP management and all that it entails. In fact, by using the policy based routing features of the ESINet, PSAP's will have more control over how their calls will be routed during busy times including evacuations or emergencies. PSAPs can even base routing on callers' needs or abilities.

L.R. Kimball recommends that the state or prime contractor manage the statewide network, the edges of the network that include border control, the bandwidth, the security of the overall network and accessibility to the statewide data bases. Service level agreements (SLAs) and performance measures will assure the SLAs are met.

10. What other states have contracted L.R. Kimball &co for this same or similar analysis and how do they compare? Is a state managed system their primary recommendation or have they had states with other recommendations?

A number of states and other political entities have contracted L.R. Kimball to conduct NG9-1-1 studies or procurement and implementation support. In terms of how our recommendations compare from one state or region to another, it must be understood that L.R. Kimball's role in each project was and is to determine the best solution for that individual client based on unique factors related to that client. Our recommendations vary, and are dependent upon the statutory framework, state 9-1-1 program configuration, the authority of a non-state-level client to undertake NG9-1-1, the needs and desires of the process participants, and funding. This report was written for Michigan.

Marquette County Central Dispatch Manager Joseph W. Van Oosterhout asked the following questions:

1. I did not see in the report (unless I missed it) how the new network would take advantage of and connect to existing networks and virtual consolidations that are being implemented over the next two years. How would that impact network management, connectivity, costs, etc? I did not see in any of the charts where savings could be realized if that collaboration took place.

Please remember this was written as a high level report and not intended to be the final design for Michigan. The use of existing networks may be possible, but must each be evaluated to determine the impact to the system. As to costs, they may reduce some transport charges or more specifically reallocate them to another entity, but the interconnection may require additional equipment that may increase costs. As existing networks are developed regionally, detailed evaluation on how to interconnect these regional networks into a statewide network becomes important. The NENA i3 and Security standards, as well as the original purpose and technology of the existing network have the most impact on these interconnections. Network management, Security Management, Configuration Management and Change Management will all have to be coordinated to allow these networks to integrate.

2. Like question 1, I did not see how Public-Private Partnerships would impact the network costs, etc. I would think we would encourage PPPs, but I did not see that in the report. I also did not see any savings listed in the charts related to the PPPs.

Public Private Partnerships are always an option to investigate. The report recommends looking at the functional needs and then initiating a procurement process. This was not a design document, but rather a high level IP feasibility study.

MICHIGAN IP FEASIBILITY STUDY QUESTIONS

3. We did a statewide survey of how much counties were being charged for recurring technical fees. What was the result of that survey?

Based on data received from the counties for 2007, the total technical charge collected was \$10,744,049.20. The number excludes the Counties of Charlevoix, Cheboygan, Emmet, Dickinson, Grand Traverse, Isabella, Kalkaska, Luce, Montmorency and Wexford because no data was received.

4. On page 4 of the report under 1.4.3 it says "in L.R. Kimball's experience, the most successful states....." What states are those? Same question for page 8 – which states have launched pilot projects and demonstrated positive benefits?

As we mentioned in response to a question we received during our presentation, Texas, Indiana, Vermont, Florida and Tennessee (among others) are well organized. As we also mentioned in response to a question from the audience, the states of Washington and Arizona are conducting pilots. The results have not yet been published.

5. On page 13 under 4.1 it states "...eight (PSAPs) specified that they are Phase II compliant. Four PSAPs specified that they are Phase I compliant only, and 32 PSAPs did not provide an answer." What does that mean? Is not Michigan fully Phase II compliant?

The information on page 13 was not intended to indicate the status of wireless E9-1-1 in Michigan. It was simply a factual report of information provided by the PSAPs in their responses to the survey we sent to them. Based on the State 9-1-1 SNC's Annual Report to the Legislature, all counties Phase II compliant.

6. Page 14 at the top 106 does not equal 33% for CAD systems.

The 33 percent appears to be a typographical error. It has been corrected in the report.

7. Page 18 under 4.3.1 – The paragraph starts out "The most important priorities for Michigan are the first four ..." I do not see Public Safety in that list. Isn't that the most important priority? Why should we allow technology to drive these NG efforts rather than framing our priorities in terms of public safety first and how technology can assist? We have already rejected some technologies that on paper look wonderful but operationally are a nightmare. Isn't it more important for us to educate the public to establish realistic expectations for 9-1-1 and public safety abilities to respond rather than the public expectations drive 9-1-1 and public safety to bankruptcy? Needs lots more discussion.....

The referenced paragraph from L.R. Kimball's report was intended to take the top priorities identified by 9-1-1 professionals and private sector industry leaders working on committees at the national and federal levels and apply them to Michigan's unique circumstances. This information can be used by Michigan's stakeholders to determine whether they want to move forward. We are glad the conversation has started and happily accept the writers challenge above.

8. If NG is as nimble and versatile as we are led to believe, would it not be better to have a "network of networks" (see questions 1 and 2) rather than trying to create, manage, pay for, etc., one large stand-alone network?

The design recommended is a network of networks that can be utilized to integrate local networks. In addition, the platform supports the ability to create a system of systems once the NG9-1-1 services are available. These services would not be duplicated for each PSAP or region. Allowing the core services to be shared across the networks will reduce duplication of effort and costs, while allowing for an equal service level across the state.

MICHIGAN IP FEASIBILITY STUDY QUESTIONS

9. Why does Michigan feel it needs to take the lead on this nationwide? Would we not be well-served to watch how implementation goes in other states? We are already way ahead of other states in Phase II, etc., why is it so important for us to strive to be out front given all that our state is currently facing? Is this being driven by grant opportunities that may disappear soon? Where is the push coming from? Are there public surveys indicating that Michigan residents are demanding this and are willing to pay for it?

We would not characterize Michigan as "taking the lead" as there are other states further ahead in this process. Based on the stakeholders input within Michigan's 9-1-1Community, the drive to NG911 is coming from the 9-1-1 community itself. There is forward momentum in the activities of IP-Based 9-1-1 in Michigan such as the P.A. 249 of 2006 report of the ETSC, the existing exploration of joint projects (such as UP Dispatch Authority and the Clinton/Ingham/Eaton counties' work towards IP911), IP-Based 9-1-1 informational sessions and training hosted by various organizations (such as the Michigan NENA chapter and MCDA), and the SNC's annual reports to the legislature. There is activity indicative of the recognition of the preparation and need to move forward to an adaptable and technology-neutral advanced 9-1-1 system to help citizens reach emergency services regardless of device.

The SNC asked L.R. Kimball to conduct a NG9-1-1 feasibility study and to report with recommendations. L.R. Kimball's report was the result of this work. The SNC (in conjunction with its stakeholders) now has the responsibility to determine how or whether to move on any, all, or none of L.R. Kimball's recommendations.

10. Why is there a rush to change legislation? Should we not first understand how NG can provide better service for the end user that is possible for public safety to provide before changing our laws, and implementation processes?

There is no rush to change legislation. L.R. Kimball has provided recommendations, on which the SNC may or may not take action. With regard to the suggestion that we should first understand how NG9-1-1 can improve service, L.R. Kimball knows firsthand that the first line of public safety is the 9-1-1 center. More than half of the calls handled every day no longer come from traditional landline services. Providing dispatchers with the tools to meet the public's expectations requires changing the backbone of our infrastructure. It is not only Kimball that says this. NENA, APCO, the USDOT and many others have produced a vast body of work that addresses the issues you raise.

Our recommendation is to use this high level report as a baseline from which to determine whether or when to move ahead. If the decision is made to move ahead, then the precise statutory and regulatory changes will need to be made that are necessary to address Michigan's circumstances.

11. If SNC remains advisory, why can it not continue to lead this effort as the L.R. Kimball report states?

The SNC, as an advisory body, does not have the authority to manage the system and develop, implement, and enforce standards, policies and procedures of the type that are required in a NG9-1-1 environment. This is a key requirement of the governance model in order to operate and protect the system.

12. I understand SNC will be forming committees to look at this from many prospective. I think that is wise, but I do not believe any decisions can be made on the basis of this report only.

L.R. Kimball considers this a statement that does not require a response.

MICHIGAN IP FEASIBILITY STUDY QUESTIONS

Bob Bradley of CCE911 asked the following questions:

1. The Study mentions all of the partnerships that will need to be formed starting with the local PSAP's for the implementation of one of the NG9-1-1 network options, but I think it needs to look a little further. In order to implement a project of this size, no matter which option is ultimately used, it all relates back to "the public" – our ultimate customer as the basic building block or relationship that needs to be formed.

L.R. Kimball does not dispute Mr. Bradley's comments and included public stakeholders in many of the tasks needed to migrate to a NG9-1-1 environment. Forward moving work should continue in the collaborative approach that has already been successfully utilized within the Michigan 9-1-1 community.

2. In the recommendation for a new committee (pg 63) the Study does mention including public representation along with PSAP, local government, and emergency responder representation. Other than this there is little mention of involving the public on this matter. In order to gain the needed financial support needed, the public will need to be educated on why this is needed, how it will be implemented, and how it will be funded.

The public education component is included in section 7.1.1. Public involvement is listed in 4 of the 7 tasks needed to develop a NG9-1-1 System.

3. Pages 28 and 29 detail "call routing" (5.3.1.2), and replacement of systems such as the MSAG with the LFV. The LFV is further noted to be basically a GIS with added data, yet does not detail where this added data will come from, who will compile and manage it, etc. While GIS is a very powerful tool when done and used correctly, it must be managed very closely or we can run the risk of easily misrouting calls to the wrong PSAP. We have all seen the problems that occur with today's MSAG based systems, and the GIS option has the potential to make this situation much better, or much worse.

The policies and procedures to accomplish this will need to be developed. The specifics of managing this data are still to be determined, but some general statements may help. GIS data is often most accurate at the lowest level, which is usually the local entity. This data is not always maintained with the surrounding jurisdictions involved. The data must be accessible by the network to perform the routing functions, and the data from the various entities must fit together without holes or overlaps.

4. Were the cost for developing, overseeing, and maintaining this new LFV included in the various cost projections?

Costs were included in the budgetary numbers as up front (one time) charges and reoccurring maintenance charges.

5. As with any network, there will be failures either of the equipment or the connections between them. While the Study does address this to some extent, I did not see a lot of detail on how this would be accomplished. Utilizing the MDIT network works on one side of the equation, but this would still be reliant on that relationship with AT&T. Are there other options that might work for the other "side" of the redundancy issue to insure that alternate pathways can be established instantly in the event of a failure? As an example of the levels of redundancy needed, the State of Michigan's LEIN is taken off-line on a regular basis for maintenance and upgrades. We cannot afford to take a 9-1-1 system down, even for a second.

The budgetary numbers included primary and redundant paths for all data connections to provide resilience. The functional requirements during a procurement process would determine if a single vendor could provide this function or multiple vendors would be required.

MICHIGAN IP FEASIBILITY STUDY QUESTIONS

Public Safety Service Levels must be maintained and enforced. Whichever vendor is selected must meet the service levels required.

6. In closing, the study is very broad in its scope, and I commend your office for this undertaking. The 9-1-1 community must move ahead to meet the changing technologies that we are presented with, and an IP based network can accomplish this. There may need to be some more consideration given to the regionalization concept for PSAP's as there are some that will not be able to make this transition.

L.R. Kimball considers this a statement that does not require a response.

Marsha Bianconi, Executive Director/911Coordinator for Conference of Western Wayne questions and comments:

1. Local control issues, 5.3.1.2: who determines call routing?

- a. Will all the call routing be based only on CRF criteria referenced in the report?

The Call routing function is the major differentiator of NG9-1-1 from Legacy. The current system can only route based on ANI, and the NG9-1-1 system will allow for routing on any field of data that is included in the call. This can be PSAP status, location, language, call type, or data (e.g. text, video). Call routing is still determined locally. Control of the delivery of the call to the PSAP will remain the same, and the way the call gets presented to the PSAP will not be altered. What is different in a NG9-1-1 system is the ability to route by policy. For the PSAP, this allows you to select alternate PSAP's for different reasons, i.e. services needed, time of day and day of week; etc.

- b. Who creates, and maintains SIP, LoST, and LIS?

These are decisions yet to be made.

- c. Who will determine redundancy for Wayne and Oakland County? Is it appropriate to use the 1 size fits all approach, or should provisions be made for size of district, population, call volumes, etc. If this recommendation is adopted, local control will be limited to staffing, answering and dispatching function: everything else would be done at a higher level.

L.R. Kimball was hired by the State of Michigan for a high level IP Feasibility study for NG9-1-1, no design has been completed for any part of the state including, Wayne or Oakland Counties

- d. For more than 20 years, Michigan's public safety community, service providers and Legislators have created an environment where 9-1-1 issues can be addressed collectively. Why would you change now before technology standards have not yet been finalized?

IP standards have existed for quite some time. NENA is updating them for 9-1-1 and they are nearing a point where they can be used. NENA predicted that these would be completed in 2009 at one point, and is now looking at mid 2010 at last report. See <http://www.nena.org/ng911-project> for a link to the list.

MICHIGAN IP FEASIBILITY STUDY QUESTIONS

2. Other L.R. Kimball Feasibility studies:

- a. L.R. Kimball indicated that they had done studies for Texas, Indiana, Vermont, Florida and Tennessee. Are copies of these studies available for SNC for review?

For this information, L.R. Kimball suggests direct contact with the states. These studies are the property of the respective states. L.R. Kimball does not have the ability to share the details without consent from those states. With regard to Vermont, L.R. Kimball did not say it had conducted a study for that state. We have not.

- b. Were all of the proposals done on a state/regional basis?

These studies were done on both a statewide and regional basis depending on the client.

- c. Are any of the states referenced similar to Michigan in population, geographic size, call volume, existing technology?

We referenced other states in response to a direct question. L.R. Kimball's project with Michigan did not involve any comparison of Michigan's population, geographic size, call volumes or existing technology with other states. Answering those questions would be a research project unto itself.

3. Liability Issues:

- a. Under the proposed system what are the liability issues for the state of Michigan, Prime Contractor, subcontractors and individual PSAPs?

MCL 484.1604 contains Michigan's liability for civil damages provisions. They broadly protect all participants in the 9-1-1 system. Any changes in current liability issues will be more appropriately addressed based on the IP solution chosen by 9-1-1.

The final system and legislative and regulatory environment at both the state and federal levels will dictate the specific liability issues and whether the existing legislation is adequate. In general, there is liability protection for 9-1-1 providers in federal and state law.

4. Funding:

- a. What happens to the local and state surcharges?

In this high level report, L.R. Kimball has not recommended changing the local and state surcharges. L.R. Kimball has suggested that funding a regional ESInet may necessitate a change to the current county-based funding structure.

- b. Would Wayne County still have the ability to assess the \$0.42 per device surcharge via county commission resolution?

L.R. Kimball did not recommend changes to local and state surcharges.

- c. Is it the assumption that funding for this project will come from utilization of all existing 9-1-1 surcharges since the report recommends review/revisions of legacy regulations, Legislation and Tariffs? (4.3.5)

MICHIGAN IP FEASIBILITY STUDY QUESTIONS

L.R. Kimball made no assumptions as to where the funding would come from. We did review current mechanisms only to identify what was currently in place.

- d. Current 9-1-1 surcharges are dedicated funds and cannot be used for other purposes. If the funding is changed and funds are no longer dedicated, how would this project be financed?

L.R. Kimball's report did not suggest that dedicated 9-1-1 funds be opened to pay for other uses.

5. Costs:

- a. When will L.R. Kimball be able to supply detailed itemized costs for the project?

This is budgetary information and not an "engineered" solution. The actual costs will be determined after the MI design is completed and a procurement process held.

- b. Using the Budgetary Estimates for the Regional system (8.8) who would be responsible for Call Access nonrecurring costs and recurring costs, Core Connection non reoccurring costs?

In this high level report, L.R. Kimball did not presume to assign that responsibility to any specific entity.

- c. What specifically are the PSAP connection costs referenced?

IP connectivity costs for redundant and resilient bandwidth from the network to the PSAP.

- d. Section 6.3.1 discusses competitive procurement process and demarcation of network costs but gives no specific information. If a cost benefit analysis shows that no significant savings were produced, why, in the worst economic time in Michigan's recent history would we embark on a project that could cost anywhere between \$77 million to \$131 million?

This is not L.R. Kimball's decision.

6. Revised SNC:

- a. Is there written information on L.R. Kimball's recommendation on the size of the board, composition, duties, and responsibilities?

See section 7.4 of the Report. L.R. Kimball recommended a nine member board.

- b. Can L.R. Kimball provide specific information on such a committee and in what state if any, such a committee exists?

L.R. Kimball reported that state level 9-1-1 boards or commissions are composed most typically of seven to eleven members. This is based on our experience working with other states. During our presentation, we were asked a similar question and responded extemporaneously that Vermont, Delaware, Indiana and Florida have such boards.

MICHIGAN IP FEASIBILITY STUDY QUESTIONS

7. Rule making authority?

- a. I have concerns that a non elected board would have rule making authority, who is held accountable for their actions?

This model has been highly successful in other states, and accountability is solidly provided. Rule making is generally done at an executive branch level, and has legislative checks and balances built into the process. 9-1-1 Boards with rulemaking authority exercise that authority under the umbrella of a host agency/department within the executive branch of government. The legislature typically requires the 9-1-1 Board to report to the governor and legislature annually. In many instances, the Board's annual budgets must be reviewed by the State's budget and accounting office and may also require legislative approval. That provides adequate accountability and assures independent oversight. Michigan's statute should be rewritten to assure an appropriate level of accountability.

8. Regional districts:

- a. Section 6 – Why would the largest populated counties (2 North and 2 South) be in the same region?

The Regions were taken from the currently defined districts just to provide examples and develop budgetary numbers. There was no intent to define any specific regions.

- b. I am encouraged that the SNC is looking at Next Generation. However, I believe that there are significant questions and issues that need to be further addressed.

L.R. Kimball considers this a statement that does not require a response.

Michael Moscovin of Ottawa County Central dispatch Authority sent the following:

Thank you for making this report available on the website. I have read the report and have the following questions:

1. The GIS datasets required at call-routing and responder-routing levels are not detailed.

- a. Are time and cost for development of those datasets inclusive in the dates and figures provided?

Time and costs were included

- b. Where will base-data originate?

Locations were not determined for budgetary pricing.

- c. Where will the datasets be stored and accessed?

Locations were not determined for budgetary pricing.

- d. Has a recommendation been made regarding data discrepancy and updating?

This is a high level feasibility study and it does not include such recommendations. System data development will be performed in the next phase of the process.

MICHIGAN IP FEASIBILITY STUDY QUESTIONS

2. Section 6.4.1 identifies the need for protection against failover using redundant interconnections across diversified data paths between regional ESINets. In the State-wide ESINet option, equipment would need to be deployed in a redundant geo-diversified fashion in order to emulate the same level of protection and availability.

- a. What is the recommendation for the level and number of diversified locations?

For budgetary purposes different functions were placed in three different locations with diverse redundant IP connectivity paths. That could change during the design phase.

- b. Has that cost been included in the figures provided?

Yes, see A above.

L.R. Kimball Responses to Feedback and Questions

At the SNC presentation held Tuesday December 8, 2009 at Michigan's Capitol, L.R. Kimball delivered a presentation of the report.

During the discussion, Mr. Mike Eades of L.R. Kimball made the following comments:

"One of the things we were asked is it possible - can we establish an IP network in the state of Michigan. The state of Michigan the business community in Michigan – yes – there are many vendors available serving the business community in Michigan – you can get IP Broadband connectivity in Michigan, UP, Owosso, wherever you want and you get IP connectivity in Michigan. Current network providers offer this transport. The state contractors, AT&T in place, any state agency can order this to get an IP connection into their facility that's in place wherever you are, that covers the entire state, wherever you are. There are CLEC, LECs cable providers that also provide this to the business community.

Now, what we may find in public safety, every call has to be noted every time. Some service leveling backs those up. May have some providers do not may not meet those service levels required for public safety.

The final answer is yes, you get broadband IP connectivity to the PSAPs to establish a network in Michigan."

The report in section 1.3 says, "It is it is possible for one or more of these existing IP networks to serve 9-1-1 across all of the State." In order to clear up any confusion, L.R. Kimball states here that the report is accurate. There is IP across the State of Michigan that could be used to build a statewide IP network for 9-1-1. While providers' coverage may be different in different areas, dark fiber, cable, wireless etc exist throughout the state. If the SNC should decide to move forward toward NG9-1-1, and desired to leverage existing IP infrastructure, the goal of any associated planning would be to bring those available networks together to form a statewide network that could provide the redundancy, security and robustness needed by a 9-1-1 system.