A report by the Interim Ohio 9-1-1 Coordinator

Public Utilities Commission of Ohio

Ohio Wireless Enhanced 9-1-1

S.B. 129 Implementation Status

November 30, 2011

Ohio | Public Utilities Commission

Members of the Ohio General Assembly,

It is my pleasure to provide you with a status report regarding wireless enhanced 9-1-1 (E9-1-1) and update you on the tremendous progress that has been made in implementing wireless E9-1-1 service in Ohio.

As you may recall, House Bill 361 (H.B. 361), as passed by the 125th General Assembly, created a funding mechanism for establishing wireless E9-1-1 service in Ohio, which is completed in two phases. Phase I service provides the tower information and caller's contact number to an emergency services dispatcher. Phase II displays both the Phase I information and the latitude/longitude of the caller's location. H.B. 361 required a monthly surcharge of .32 cents to be assessed to each wireless phone number assigned to an Ohio subscriber, which is then remitted to approved counties to assist in implementing this life-saving service. Subsequently, the 127th General Assembly passed Amended Substitute Senate Bill 129 (S.B. 129), effective December 30, 2008 which lowered the monthly wireless surcharge to .28 cents and established a December 31, 2012 sunset date for the surcharge.

S.B. 129 also requires the Ohio 9-1-1 coordinator to provide the General Assembly with a report regarding the implementation progress of wireless E9-1-1 and a recommendation of any change in the amount of the monthly surcharge. As of the writing of this report, all 88 counties have been approved to receive funding. Since October 1, 2005, the 9-1-1 Service Program has distributed a total of approximately $167 million to Ohio counties from the Wireless 9-1-1 Government Assistance Fund.

Of the 88 counties in Ohio, 85 counties have completed Phase II E9-1-1 service. Of the three remaining counties, Trumbull and Harrison counties are Phase I compliant and expect to achieve Phase II service by the end of 2011. Columbiana County expects to achieve both Phase I and Phase II wireless E9-1-1 service by the end of 2011.

On August 9, 2010 and September 21, 2011, the Wireless 9-1-1 Advisory Board and the Ohio 9-1-1 Council issued a survey to all 88 counties to determine the total estimated implementation costs for each county. The results show that the amount of the wireless surcharge will adequately and appropriately fund continued reliability of wireless E9-1-1 across Ohio. No change in the amount of the fund is recommended at this time. However, funding for wireless E9-1-1 under the current statute should continue for a limited period of time (e.g., 1 year) after the December 31, 2012 sunset date for further study and ultimately be transitioned to a "Next Generation" 9-1-1 system.

Thank you for your attention to this important public safety issue. Should you have any questions, please do not hesitate to contact me at (614) 728-2855.

Sincerely,

Marianne Townsend
Interim Ohio 9-1-1 Coordinator, Ohio 9-1-1 Service Program
Chief, Telecommunications Division
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Report Highlights

Progress of Wireless E9-1-1 in Ohio

- Since October 1, 2005, the Ohio 9-1-1 Service Program has distributed a total of approximately $167 million to Ohio counties from the Wireless 9-1-1 Government Assistance Fund.

- All 88 counties have completed the wireless amendment to their countywide 9-1-1 plan and have been approved to receive disbursements from the Wireless 9-1-1 Government Assistance Fund.

- Of the 88 counties in Ohio, 85 counties have completed wireless Phase II 9-1-1 service. Of the three remaining counties, Trumbull and Harrison counties are Phase I compliant and expect to achieve Phase II service by the end of 2011. Columbiana County expects to achieve both Phase I and Phase II wireless 9-1-1 service by the end of 2011.

Future of E 9-1-1 in Ohio

- New types of communication possibly including, but not limited to, text, pictures, and video will be directed to PSAPs and are outside of the current Ohio wireless 9-1-1 statutes' funding mechanism. Counties will require funding to modernize legacy systems and equipment in order to connect with a statewide network and each other via a next generation (Next Gen) 9-1-1 network that is not geographically limited by governance or infrastructure.

- The current amount of the monthly surcharge is appropriate to cover the continued reliability of wireless E9-1-1 across Ohio. No change in the amount of the surcharge is recommended at this time. However, funding for wireless E9-1-1 under the current statute should continue for a limited period of time (e.g., 1 year) after the December 31, 2012 sunset date and ultimately be transitioned to a "Next Generation" 9-1-1 system.

- As soon as possible, the Ohio General Assembly should provide the Ohio 9-1-1 Coordinator with additional authority in order for the coordinator, with assistance from the Ohio 9-1-1 Council and the Ohio 9-1-1 Advisory Board, to perform a comprehensive study of the current 9-1-1 funding mechanisms in Ohio and recommend changes to move Ohio forward to a Next Gen 9-1-1 system during the limited period of time that the surcharge is extended.

- Additionally, the legislature should consider expanding the Ohio 9-1-1 Coordinator role to a position providing not only oversight of the funding, but also expanded authority to review, authorize and audit the use of the funds. It will also be necessary for each county and their subdivisions to document the use of 9-1-1 funds in a more detailed manner and to provide timely information to the Ohio 9-1-1 coordinator as to its progress towards a Next Gen 9-1-1 network. A county failing to respond to information requests or audits by the Ohio 9-1-1 Coordinator should be subject to a cessation in 9-1-1 funding by the state and repayment of any 9-1-1 revenue received by the county.

Introduction and Background

House Bill 491 was signed into law by Governor Celeste on June 18, 1985. This piece of legislation formally established a methodology for local governments in Ohio to adopt 9-1-1 plans and begin offering the service on a countywide basis. Due to where technology stood at the time, this enabling legislation only contemplated 9-1-1 service over the wireline telephone network.

In order to lessen the financial burden on local jurisdictions, wireline telephone companies were provided a tax credit for their initial nonrecurring costs. In addition, a bill and keep system was established for the wireline telephone companies to recover the recurring costs of the 9-1-1 network. Under this funding structure, a tariffed charge appears on each customer's monthly bill. As such, each public safety answering point (PSAP) is not charged for the wireline 9-1-1 call traffic.

Jurisdiction for the 9-1-1 service itself was given to the Public Utilities Commission of Ohio (PUCO). Shortly thereafter, the PUCO established case number 86-911. Over the next 25 years, the entries and orders issued within this and other cases formed the regulatory framework for 9-1-1 in Ohio. The Commission issued decisions that defined the rules around which local exchange carriers could recover their 9-1-1 costs under the bill and keep system created in the original legislation. Today, all 88 of Ohio's counties have established wireline enhanced 9-1-1 (E9-1-1) systems.

As proliferation of wireless phones increased, it became apparent that the existing funding models should be expanded. In 2004, the 125th General Assembly passed House Bill 361 (HB 361). A 32 cent wireless 9-1-1 surcharge was created under this bill and assessed to each wireless phone number with an Ohio billing address on a monthly basis. The funds may be utilized for any costs of designing, upgrading, purchasing, leasing, programming, installing, testing, or maintaining the necessary data, hardware, software, and trunking required for the PSAP to provide wireless enhanced 9-1-1. Once a county has fully implemented wireless enhanced 9-1-1, it may begin to utilize the wireless funds to pay for PSAP personnel costs.

To administer these funds, HB 361 created a new statutory position, the Ohio 9-1-1 Coordinator. This individual is charged with ensuring the collection of the funds and distributing the dollars to those counties that have amended their countywide 9-1-1 plans to begin providing wireless enhanced 9-1-1. Also created within HB 361 were the Ohio 9-1-1 Council and the

Wireless Advisory Board. The Wireless Advisory Board is made up of six individuals and is charged with consulting with the PUCO and coordinator in adopting administrative rules in relation to HB 361 and also with advising the Coordinator in preparing a report due to the General Assembly. The Ohio 9-1-1 Council is comprised of 11 members and is charged with establishing statewide technical and operating 9-1-1 standards and making statutory recommendations to the Ohio legislature.

The initial legislation placed a December 31, 2008 sunset provision on the wireless funding. With the tireless efforts of a number of groups, the 127th General Assembly passed Senate Bill 129 in December 2008. Under the language of this bill, the surcharge was extended until the end of 2012. In addition, the surcharge was lowered to 28 cents per month, the guaranteed annual minimum disbursement amount was increased to $90,000 for each county, and a five PSAP limitation for funding eligibility was imposed on the countywide 9-1-1 systems.

As of the drafting of this report, all 88 Ohio counties are receiving wireless funding. Two counties have enacted Phase I wireless E9-1-1 service, which provides the PSAP with the tower information and caller's contact number; and another 85 counties have achieved Phase II service, which provides the PSAP with all of the Phase I information in addition to the approximate latitude and longitude of the caller's plotted location.

Recognizing the need to continue to advance 9-1-1 service in Ohio, the Ohio 9-1-1 Council passed resolution 09-01 on October 29, 2009. This resolution formally established seven working groups to tackle issues relevant to 9-1-1 in Ohio. These topics included education/outreach, funding, operational standards/best practices, technical standards/best practices, state 9-1-1 plan, next generation 9-1-1, and legislative changes. The Council, believing it was imperative to gain input from all interested parties, issued a memorandum on April 26, 2010 to a number of associations and users groups requesting participation. Several of those groups have come forward and have begun working together. The Council's hope is to explore issues related to these seven topics and advance the development of comprehensive 9-1-1 policies into the future with a unified voice.

Ohio Statutes and Administrative Rules

By virtue of the legislation mentioned above, 9-1-1 service in Ohio is governed by Sections

4931.40 through 4931.70 of the Ohio Revised Code (ORC) and rules 4901:1-8-01 through 4901:1-8-06 of the Ohio Administrative Code (OAC).

State Regulation and Ohio 9-1-1 Council and Advisory Board

The PUCO is charged with regulatory oversight of the wireline portion of the 9-1-1 network. This jurisdiction includes both approval of system service provider tariffed charges and service quality. The PUCO does not hold any regulatory authority over 9-1-1 wireline funding at the local level, nor the handling of 9-1-1 calls at the PSAP location. This is generally overseen by local elected officials.

The Ohio 9-1-1 Coordinator position was created in 2005 to administer the wireless 9-1-1 surcharge. The Coordinator is appointed by the PUCO chairman after receiving a list of nominations from the Ohio 9-1-1 Council. The Ohio 9-1-1 Coordinator is specifically charged with administering the wireless 9-1-1 Government Assistance Fund. In addition, the coordinator is charged with submitting a report to the Ohio General Assembly by November 30, 2011, which provides a review of the implementation and provision of wireless enhanced 9-1-1 and a description of how disbursements from the wireless 9-1-1 government assistance fund have been used. The coordinator must also issue a recommendation regarding any change in the amount of the wireless 9-1-1 charge for the upcoming biennium. The PUCO chairman may establish additional duties of the coordinator based on a list of recommended duties submitted by the Ohio 9-1-1 Council.

The Ohio 9-1-1 Council is established under Section 4931.68 of the ORC. This body is made up of 11 members, which include the Ohio 9-1-1 Coordinator; a designee of the Department of Public Safety, selected by the Director of Public Safety; one representative of public safety communications officials; one representative of administrators of 9-1-1 service; one representative of countywide 9-1-1 systems; three representatives of wireline service providers; and three representatives of wireless service providers in this state. All members other than the 9-1-1 Coordinator and public safety representative serve three year terms and are appointed by the governor. Duties of the council include:

> (1) Arbitrating or establishing nondiscriminatory, competitively neutral, and uniform technical and operational 9-1-1 systems standards consistent

with recognized industry standards and federal law. This authority does not include authority to prescribe the technology that a telephone company or reseller uses to deliver 9-1-1 calls;

(2) Conducting research and making legislative or policy recommendations or reports regarding any wireline and wireless 9-1-1 issues, or any improvements in the provision of service by 9-1-1 systems; and,

(3) Submitting names of nominees for the position of the Ohio 9-1-1 Coordinator and recommended duties; and, at least biennially, conducting and submitting with recommendations to the public utilities commission a performance evaluation of the coordinator.

The Ohio Wireless 9-1-1 Advisory Board was created under Section 4931.69 of the ORC. This body is tasked with making a recommendation to the 9-1-1 Coordinator regarding the amount of the wireless 9-1-1 charge to be included in the report to the General Assembly, and also consulting with the PUCO and the 9-1-1 Coordinator regarding any rules to be adopted under ORC section 4931.67. The Board is made up of the Ohio 9-1-1 Council appointee that represents public safety communications officials, one of the Council appointees that represent wireless service providers, one non-Council representative of wireless service providers, one non-Council representative of public safety communications officials, and two non-Council representatives of municipal and county governments. The governor appoints all of the Board's members to three year terms.

There are currently no vacant seats on the 9-1-1 Council and four vacancies on the Wireless 9-1-1 Advisory Board. Members of both these bodies include:

Ohio 9-1-1 Council	**Wireless 9-1-1 Advisory Board**
Lynne Feller – Wayne County (Chair)	Lynne Feller – Wayne County
Major Kevin Teaford – Public Safety	Robert Peebles – AT&T
Monte Diegel – Mercer County	Wireless Service Provider
Larry Long – CCAO	Vacant (OTA)
Yvonne Lesicko – CBT Wireless	Public Safety Official
Laura Merritt – Verizon Wireless	Vacant (APCO)

Robert Peebles – AT&T Mobility	Municipal and County Officials
Susan Drombetta – AT&T Ohio	2 Vacancies (CCAO)
Nancy Serafino – CenturyLink	
Homer Dalton – Frontier	

Marianne Townsend – Interim Ohio 9-1-1 Coordinator, PUCO

Wireless E9-1-1 Funding

Sections 4931.61 through 4931.651 of the ORC prescribe the funding mechanism for wireless E9-1-1. Each month a surcharge is imposed upon each wireless phone number belonging to a subscriber with an Ohio billing address. This monthly surcharge is currently set at 28 cents and will expire December 31, 2012. Wireless service providers remit the collected surcharges to the Ohio 9-1-1 Service Program, housed within the PUCO, on a monthly basis.

According to a July 2011 report by the National Emergency Number Association, 48 states currently have some type of charge funding state wireless 9-1-1 systems. This national study found that state wireless 9-1-1 surcharges range from 19 cents to $3. While Ohio's surcharge is at the lower end of this range, it must be noted that different funding models exist throughout the country. In some states, the surcharge revenues are divided between the wireless service provider and the county. Please visit http://www.nasna911.org/resources.php for further information on individual state's 9-1-1 funding mechanisms.

Prepaid providers are permitted three options under ORC 4931.61 to calculate the amount due, as follows:

> (1) At the point of sale. For purposes of prepaid wireless services, point of sale includes the purchasing of additional minutes by the subscriber along with any necessary activation of those minutes;
>
> (2) If the subscriber has a positive account balance on the last day of the month and has used the service during that month, by reducing that balance not later than the end of the first week of the following month by the amount of the charge or an equivalent number of airtime minutes;

(3) By dividing the total earned prepaid wireless telephone revenue from sales within this state received by the wireless service provider or reseller during the month by fifty, multiplying the quotient by twenty-eight cents, and remitting this amount pursuant to division (A)(1) of section 4931.62 of the Revised Code.

A total of $30,354,006.04 in wireless surcharge fees was remitted to the Ohio 9-1-1 Service Program by wireless service providers in fiscal year 2011. The wireless service providers and PUCO are each permitted to retain up to 2 percent of the collected funds. The remaining 96 percent is distributed monthly to each of the 88 counties in Ohio.

By November 1 of each year, the Ohio 9-1-1 Service Program collects, directly from each wireless service provider, the number of wireless phone numbers tied to billing addresses in each county. A percentage is calculated for each individual county based upon the total number of wireless numbers within that county, divided by the total number of wireless numbers in the state. This same percentage is utilized through the rest of the calendar year.

Each month the wireless remittances received are multiplied by the individual county allocation percentages to determine the amount due to each county that month. Once certified by the Ohio 9-1-1 Coordinator, the funds are distributed to the individual county treasurers. Under ORC 4931.64 (D) the county treasurer then internally allocates the funds as defined by that county's 9-1-1 plan. To the extent the fund balance permits, each county is guaranteed a minimum allocation of $90,000 per year pursuant to ORC 4931.64 (B)(2).

Upon receipt, individual county treasurers internally allocate the funds in accordance with that county's unique countywide 9-1-1 plan. Funds may only be utilized by the local governmental entities for the implementation and maintenance of wireless E9-1-1. Section 4931.65 of the ORC dictates the purposes for which the wireless funds may be expended at the local level. On March 21, 2007, under case number 05-1114-TP-EMG, the PUCO issued guidance regarding appropriate expenditures for which the wireless funds could be utilized such as for certain mapping, hardware, software, 9-1-1 network trunking, training, and personnel costs.

Neither the Ohio 9-1-1 Service Program nor the PUCO hold regulatory or audit authority over how local entities utilize 9-1-1 funding. Decisions regarding the use of 9-1-1 funding are made at the local level. The Auditor of State may enter into an audit engagement to determine the

appropriate use of these funds and the Ohio Attorney General may bring suit against a telephone company service provider or a local subdivision to enforce compliance with the Ohio 9-1-1 Service Program.

Incumbent wireline service providers incur incremental costs over and above wireline 9-1-1 to carry wireless 9-1-1 traffic and associated information. As such, each incumbent local exchange carrier which acts as a 9-1-1 host in Ohio has received PUCO approval to recover a tariffed charge for these costs. The charges and billing methodology found within these tariffs are unique to the individual carrier. Ohio law also permits governmental entities and carriers to enter into unique negotiated arrangements outside of these tariffs. A summary of the charges may be found in Appendix I.

Voice Over Internet Protocol (VoIP) and Other Internet Protocol (IP) Based Service

Ohio does not currently possess statutory funding language dealing with the collection of 9-1-1 user fees from IP based services which access the 9-1-1 System (e.g., text, video, and data).

Other Local Funding Options

Sections 4931.51 through 4931.54, 5705.19, and 5739.026 of the ORC provide various options for counties to obtain general local funding for their E9-1-1 system. These options include charges on improved realty, monthly telephone bill charge, monthly telephone access line charge, property tax, and local sales tax.

- Under ORC 4931.51, county voters may approve a charge on improved realty to cover the costs of establishing, equipping, and furnishing one or more public safety answering points within the county.

- ORC Sections 4931.52 and 4931.53 permit county voters to approve a county fee to be placed on local wireline telephone bills. The monthly charge may not exceed $.50. Under ORC 4931.54, a telephone company which collects this charge on behalf of the

county may retain 3 percent of the charge it collects as compensation for the costs of such collection. The collected funds are remitted to the county on a quarterly basis.

- Section 5705.19 of the ORC permits county electors to approve a tax in excess of the 10 mill limitation to fund the establishment of a 9-1-1 system.

- A county sales tax, not exceeding one half of one percent, is permitted to be used for 9-1-1 under Section 5739.026 of the ORC. If the county is utilizing all of the sales tax solely to fund 9-1-1, the tax may not be levied for more than five years.

Progress to Date

Funding Approvals

All 88 counties have completed the wireless amendment to their countywide 9-1-1 plan and have been approved to receive disbursements from the Wireless 9-1-1 Government Assistance Fund. Since October 1, 2005, the 9-1-1 Service Program has distributed $167 million to the counties as of the writing of this report (see Appendix B).

Completed Counties

Of the 88 counties in Ohio, 85 counties have completed Phase II Wireless deployment. Of the remaining three, Trumbull and Harrison counties, which are Phase I compliant, expect to implement Phase II by the end of the year. Columbiana County has stated that it should become Phase I and Phase II compliant by the end of the year.

Use of the Funds

Wireless 9-1-1 Survey

On August 9, 2010, a comprehensive survey was sent to each county in Ohio. This

survey, compiled by the Ohio 9-1-1 Council and issued by the Ohio 9-1-1 Coordinator, was designed to gather data regarding each county's 9-1-1 status, funding situation, estimated costs of implementing wireless E9-1-1, and use of any disbursements from the Wireless 9-1-1 Government Assistance Fund. After multiple reminders, the Ohio 9-1-1 Coordinator experienced a return rate of approximately 70 percent for the initial survey. The information sought by this survey was complex and detailed, and, as a result, many of the responses to the initial survey were incomplete. Therefore, the Ohio 9-1-1 Coordinator decided to reissue the survey on September 21, 2011. This new survey was designed to target only the information required by R.C. 4931.70 to be reported to the General Assembly. The Ohio 9-1-1 Coordinator received responses from 81 of the 88 counties or 92 percent.

The Ohio 9-1-1 Council expected that the information gathered from these surveys would be used to determine how the 28 cent monthly surcharge was used and to formulate a recommendation regarding any change in the amount of the surcharge. While the response to the second survey was more successful than the initial survey in both responses and information provided, however, the information gathered was not specific enough to address the needs of this report. General conclusions can be provided, as discussed below, based upon the information provided by the counties in terms of expenditures and need for continued funding for ongoing costs.

County Expenditures

The results of the survey, as shown in Appendix D to this report, indicate that the expenditures to implement and maintain wireless 9-1-1 in Ohio continue to increase.

In general, counties first utilized their funds for equipment and software upgrades in order to process information being provided by the wireless E9-1-1 calls. Without these upgrades, the data transmitted to the call taker would not display on the screen properly and could not be used to find the caller. The costs associated with completing these upgrades vary according to the type and age of the equipment.

Another large expense associated with implementing wireless E9-1-1 is mapping. Phase II service provides the call taker with the geographical coordinates of the wireless caller. These coordinates are virtually useless by themselves. The data must be input into some type of

mapping system to plot the caller's location. There are a number of private companies supplying mapping systems, each with their own individual features. Ongoing maintenance of the systems is vital to updating the maps as streets, address numbering, and geographical features change.

ORC 4931.65 permits PSAPs to utilize disbursements from the fund to cover costs of training the staff of the PSAP to provide wireless enhanced 9-1-1. The PUCO's entry of March 21, 2007 in 05-1114-TP-EMG clarified that costs associated with training 9-1-1 call takers in answering wireless calls, managing the information provided, and utilizing new computer systems to process the wireless information is an appropriate use of the wireless 9-1-1 funds.

The final major cost category affecting a county implementing wireless E9-1-1 is the fees charged by the county's host 9-1-1 wireline carrier. As previously discussed in this report, tariffs have been approved by the PUCO for several incumbent wireline service providers. Through these tariffs, the carriers are permitted to recover costs associated with upgrades and additional maintenance of the wireline 9-1-1 system related to transmitting wireless E9-1-1 calls and enhanced data. However, charges do not take effect until the county begins taking Phase I or Phase II calls. As with the other costs associated with establishing wireless E9-1-1, tariffed charges also vary from county to county.

In addition to the tariffed service itself, some counties may elect to install additional trunks. Dedicating trunks to wireless E9-1-1 calls allows the PSAP to ensure that the 9-1-1 system is not overloaded by multiple wireless calls being made in response to the same incident. Wireless calls are routed separately from wireline calls, decreasing the occurrence of a wireline or wireless 9-1-1 caller experiencing a busy signal. A county that adds additional trunks will experience additional charges, as the cost for these trunks is not recoverable under the wireline surcharge permitted by ORC section 4931.47.

HB 361 permitted counties to begin utilizing disbursements for PSAP personnel costs after August 1, 2006. Prior to taking advantage of this provision, an individual county or its subdivision must complete a certification process with the Ohio 9-1-1 Coordinator. Within this process, the county must first show all other costs associated with establishing wireless E9-1-1 have been expended and that Phase II implementation is complete. To date, 29 counties, 18 municipalities and a township have submitted personnel certifications on behalf of the PSAPs

located within those jurisdictions to the Ohio 9-1-1 Coordinator.

Any county that implements wireless E9-1-1 service will incur ongoing costs. These include, but are not limited to, wireline tariffs, mapping updates and maintenance, training, and personnel costs. Under the current statutory language, the recurring costs a county experiences going forward after the sunset would have to be recovered through any remaining balance from the Wireless 9-1-1 Government Assistance Fund or through some other outside funding source.

Current and Future 9-1-1 Infrastructure

While public safety entities within Ohio have made in-roads to radio communications interoperability, 9-1-1 interoperability remains at the same level today as its inception in Ohio in 1988.

The current telephony network structure, customer premise equipment, legislation, regulatory rules, local governance, and operation worked very well for voice-centric, land-based 9-1-1 systems. The advent of wireless and Voice over the Internet (VoIP), along with new technologies that are designed for data, voice and video have severely challenged the current infrastructure, expecting it to perform functions that it was never designed to handle.

Our present 9-1-1 systems are lagging behind in Internet Protocol (IP) based networks which are common place throughout other industries. Next Generation 9-1-1 and the infrastructure referred to as ESInets (Emergency Services IP Networks) will provide interconnection and interoperability for both voice and critical data sets, beyond traditional jurisdictional boundaries and may lend itself to consolidation of services. Next Generation 9-1-1 ESInets will allow all forms of Emergency Services, including 9-1-1 and public safety communications centers, to work together and share data and information beyond traditional radio interoperability. The transition to ESInets is necessary to continue to provide the services both citizens and visitors to Ohio expect. With the goals of avoiding duplication of infrastructure and minimizing costs, it is imperative to examine the partnership opportunities available among existing voice and data systems throughout Ohio and future deployments of statewide information sharing systems.

Currently, the Federal Communications Commission (FCC) is also examining issues surrounding Next Gen 9-1-1 and moving towards accelerating its development throughout the country. On September 22, 2011, the FCC released a Notice of Proposed Rulemaking (NPRM) in

PS Dockets 11-153 and 10-255 entitled "In the Matter of Facilitating the Deployment of Text-to-911 and Other Next Generation Applications and Framework for Next Generation 911 Deployment." As the FCC explains in the Introduction to the NPRM:

> In this Notice of Proposed Rulemaking, we seek to accelerate the development and deployment of Next Generation 911 (NG911) technology that will enable the public to send emergency communications to 911 Public Safety Answering Points (PSAPs) via text, photos, videos, and data and enhance the information available to PSAPs and first responders for assessing and responding to emergencies. Sending text messages, photos, and video clips has become commonplace for users of mobile devices on 21st century broadband networks, yet our legacy circuit-switched 911 system does not support these forms of communication. While continuing to ensure reliable voice-based 911 service will always be essential as we migrate to NG911, adding these non-voice capabilities to our 911 system will significantly improve emergency response, save lives, and reduce property damage. Incorporating text and other media into the 911 system will make it more accessible to the public, both for people with disabilities and for people in situations where placing a voice call to 911 could be difficult or dangerous.

Please see Appendix F to this report for further detail regarding Next Gen 9-1-1 systems as prepared by the Next Gen 9-1-1 Working Group of the Ohio 9-1-1 Council.

Funding Recommendation

While 85 counties have fully implemented Phase II wireless service and the three remaining counties will implement it by the end of 2011, revenue will continue to be needed to cover recurring costs such as tariff fees, maintenance, upgrades, training, and staffing, which are vital to ensuring an efficient and effective wireless E9-1-1 system. As demonstrated by Appendix G, to this report, while wireless calls have increased over the last several years, the volume of wireline calls have remained fairly consistent. As previously discussed, other types of communication possibly including, but not limited to, text, pictures and video will be directed to PSAPs and are outside of the current Ohio wireless 9-1-1 statutes' funding mechanism. Counties will require funding to modernize legacy systems and equipment in order to connect with a statewide network and each other via a next generation network that is not geographically limited by governance or infrastructure. Furthermore, PSAP personnel will require training on new

technology, as the types and character of 9-1-1 communications will drastically change with the advent of Next Gen 9-1-1.

At this time, changing the amount of the monthly surcharge and funding mechanism is not recommended due to the ongoing need for revenue to maintain an effective wireless E9-1-1 system. However, funding for wireless E9-1-1 under the current statute should continue for a limited period of time (e.g., 1 year) after the December 31, 2012 sunset date and a comprehensive study, as more fully discussed below, should be preformed in order to determine whether the fund should ultimately be transitioned to a Next Gen 9-1-1 fund that is technology neutral.

In addition, the Legislature should consider expanding the Ohio 9-1-1 Coordinator role to a position providing not only oversight of the funding, but also expanded authority to review, authorize and audit the use of the funds. The Ohio 9-1-1 Coordinator should possess or obtain the technical knowledge and necessary support to comprehensively review the current 9-1-1 funding mechanisms in Ohio and to provide recommendations moving Ohio forward to a Next Gen 9-1-1 system.

In response to the original survey and the subsequent data request, several counties indicated projected expenditures for Next Gen 9-1-1 systems. Legislative changes will be necessary for those counties to fully implement Next Gen technologies with reserved and/or future monies. The Ohio General Assembly should require a study by the Ohio 9-1-1 Coordinator with assistance from the Ohio 9-1-1 Council and the Ohio 9-1-1 Wireless Advisory Board to comprehensively review the current 9-1-1 funding mechanisms and to determine the legislative, infrastructure and governance changes that will be necessary to implement a Next Gen 9-1-1 network in Ohio and to allow counties to use current or future monies to fund Next Gen 9-1-1. This study may occur as soon as possible but no later than the additional limited period of time (e.g., 1 year) that the current wireless 9-1-1 fund is recommended to be extended beyond the current December 31, 2012 sunset date of the wireless 9-1-1 surcharge.

It is evident that the implementation of Next Gen will not be successful without the oversight and funding authority by the state. An effective model could entail the individual counties continuing to have the ability to determine and implement Next Gen architecture within their own jurisdictions. However, the counties must be provided with the appropriate technical standards, guidance and recommendations necessary for interaction with other counties and the

state in order for counties to understand the importance of moving to a Next Gen 9-1-1 system. This model can only be accomplished with expanded authority of the state 9-1-1 coordinator as previously discussed. Finally, it will also be necessary for the county and its subdivisions to document the use of the 9-1-1 funds in a more detailed manner and to provide timely information to the state 9-1-1 coordinator as to its progress towards a Next Gen network. A county failing to respond to information requests or audits by the Ohio 9-1-1 Coordinator should be subject to a cessation in 9-1-1 funding by the state and repayment of any 9-1-1 revenue received by the county.

Conclusion

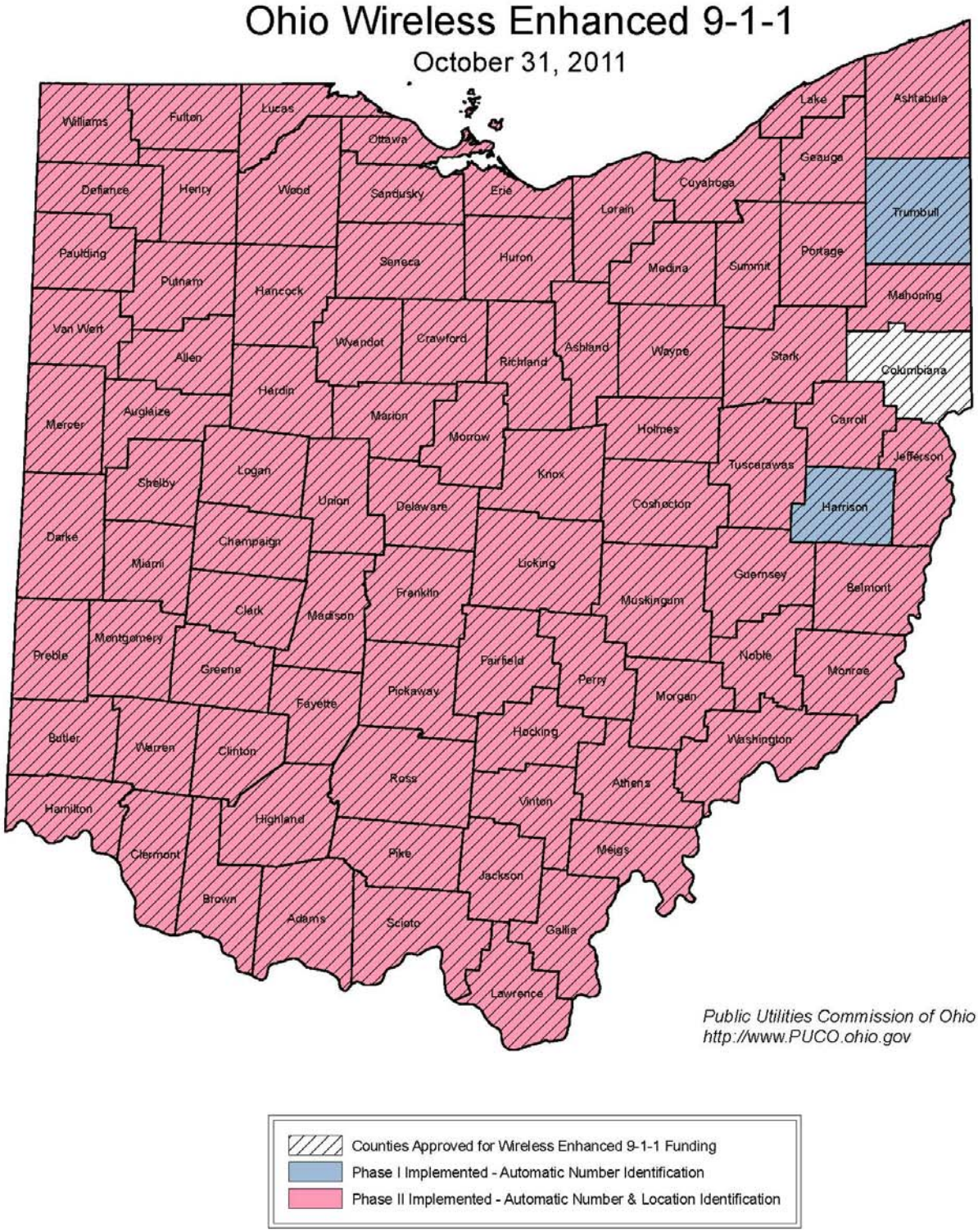
As discussed in this report, the 9-1-1 Service Program has made great strides in the statewide implementation of wireless E9-1-1. To date, almost all of Ohio's 88 counties have implemented Phase II wireless service. The remaining three counties without Phase II wireless 9-1-1 expect to implement it by the end of the year. Wireless Phase II was implemented by Ohio counties and wireless service providers in approximately six years. This is amazing progress when compared to the implementation of wireline 9-1-1 which took more than two decades to fully implement throughout Ohio. The Ohio General Assembly, county officials, wireless service providers, the 9-1-1 Service Program, and the Ohio 9-1-1 Council and Advisory Board all deserve credit for the effective implementation of an important lifesaving measure for all wireless end users in Ohio.

As the report demonstrates, however, our work in 9-1-1 is not complete. The wireless 9-1-1 network will continue to experience a need for maintenance and upgrades. As technology continues to evolve, consumers will expect to be able to not only call 9-1-1 but to provide additional information such as text, data, images, and video over Next Gen 9-1-1 networks. Many states have started down the road to implementing Next Gen and Ohio must not be left behind. Therefore, the Ohio 9-1-1 Coordinator, the Ohio 9-1-1 Council and the 9-1-1 Advisory Board recommend that the funding recommendations in this report be further investigated and adopted by the Ohio General Assembly. The Ohio 9-1-1 Coordinator and the Ohio 9-1-1 Council and Advisory Board will be pleased to provide further information to members of the Ohio General Assembly as the December 31, 2012 sunset date approaches.

Appendix List

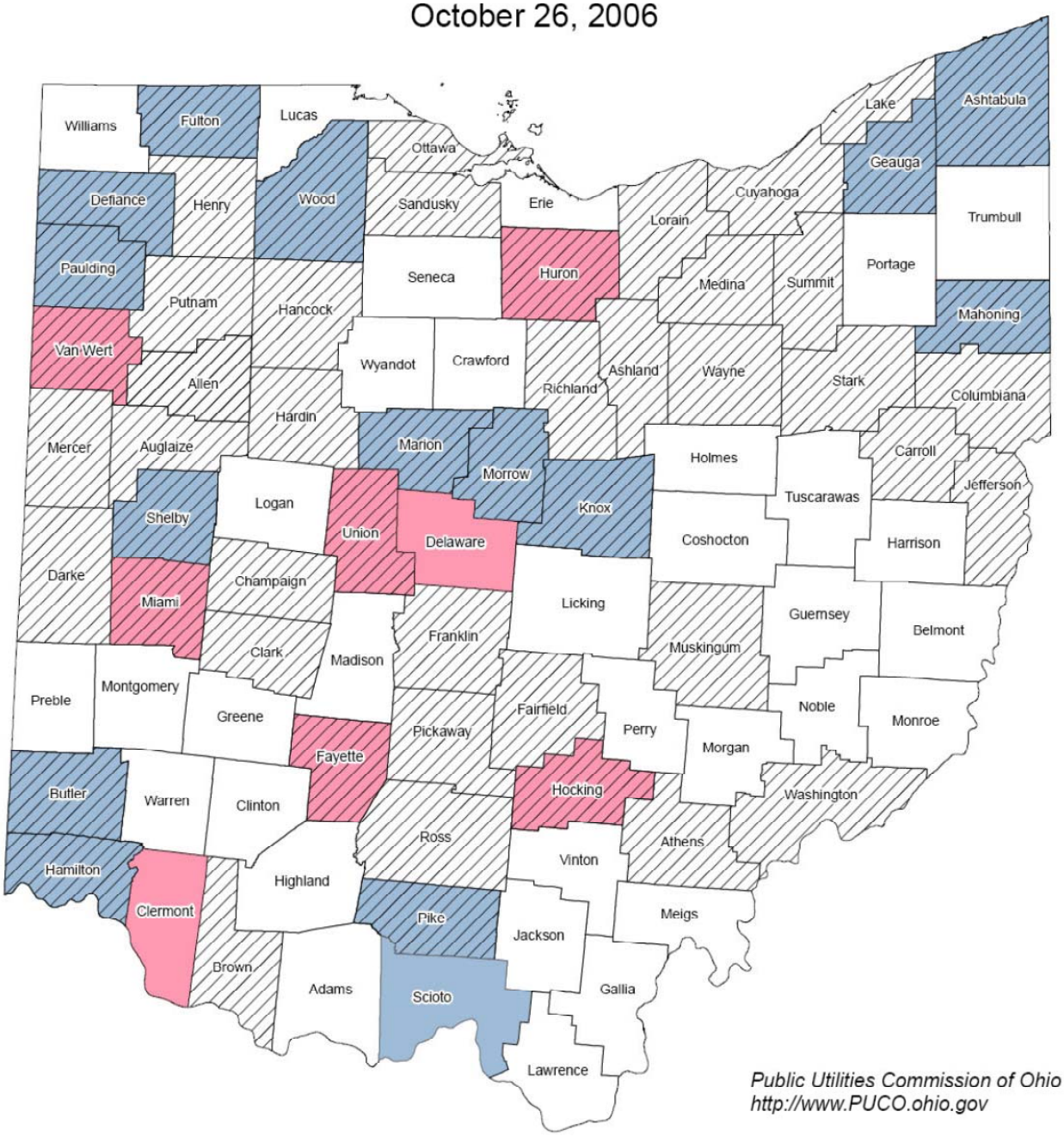
A. Current Phase Status Map and Status Map 2006
B. Wireless Disbursements
C. Data Request
D. Wireless Expenditures
E. Expense Categories
F. Next Gen Workshop
G. Call Volumes
H. Wireless Disbursements vs. Expenditures
I. Wireless Tariff Charges

Appendix A-Deployment Maps



Ohio Wireless Enhanced 9-1-1

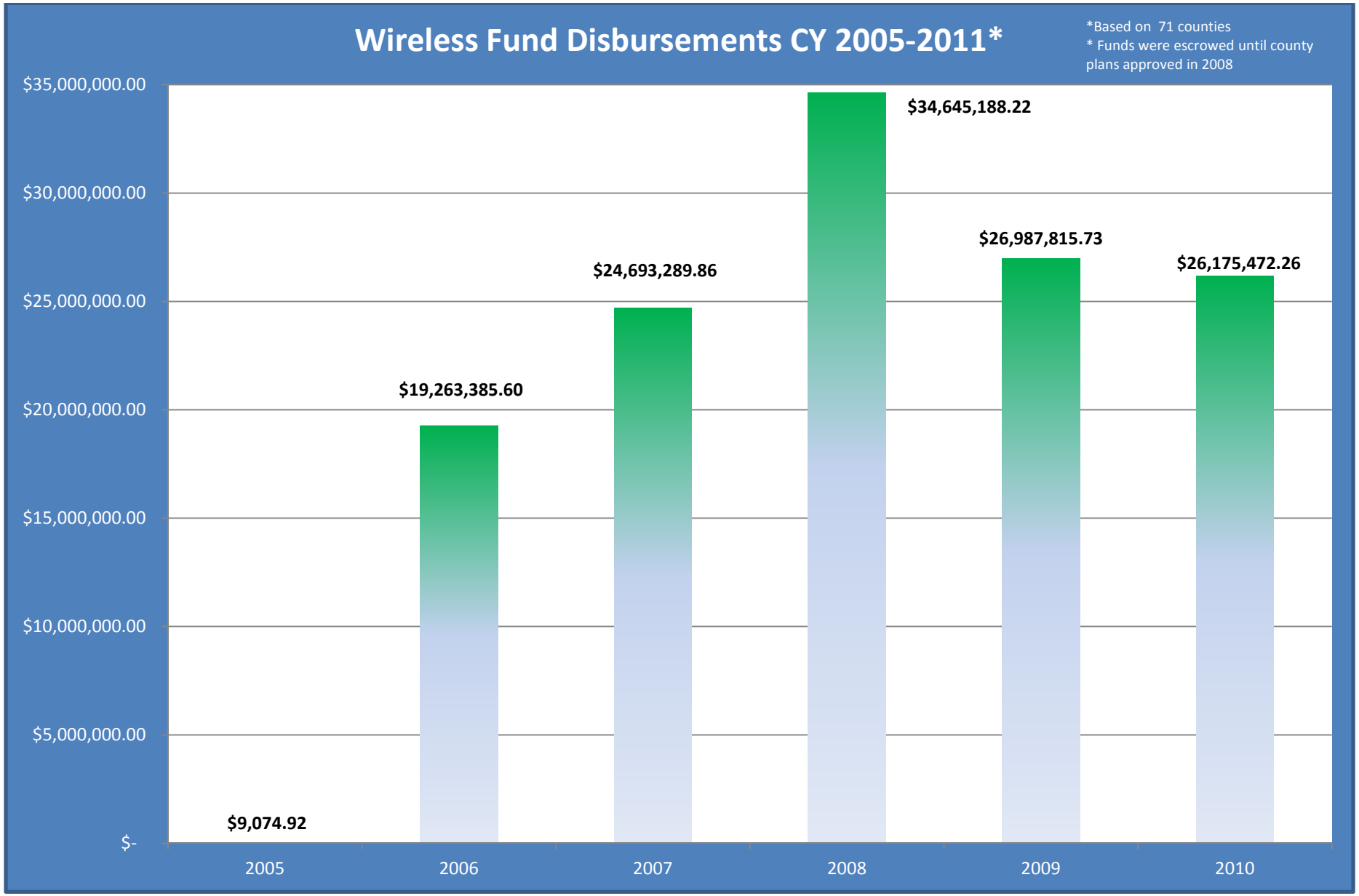
October 26, 2006



Public Utilities Commission of Ohio
http://www.PUCO.ohio.gov

Counties Approved for Wireless Enhanced 9-1-1 Funding
Phase I Implemented
Phase II Implemented

Appendix B-Wireless Disbursements



Appendix C-2011 Data Request

2011 Ohio 9-1-1 Council Data Request

Please Respond By October 5, 2011

County Demographics

County Name: _____

Number of Primary PSAPs in County (Please include a contact name & phone/email for each on separate sheet): _____

Number of Secondary PSAPs in County (Please include a contact name & phone/email for each on separate sheet): _____

Call Volume Information

2008 Wireline Call Volume: _____

2009 Wireline Call Volume: _____

2010 Wireline Call Volume: _____

2008 Wireless Call Volume: _____

2009 Wireless Call Volume: _____

2010 Wireless Call Volume: _____

Expenditures

Please check all annual expenditures types that apply for each year 2005-2010. Include as many copies of this page as needed for each PSAP.

2005 Total Annual expenditures: _____ Expenditures

from Wireless Fund for each PSAP: _____ PSAP Name

- ☐ Tariffs
- ☐ Wireless Trunks
- ☐ Mapping Software Purchase/upgrade/interface/maintenance
- ☐ 9-1-1 CPE purchase/upgrade
- ☐ 9-1-1 related hardware purchase
- ☐ 9-1-1 software maintenance
- ☐ PSAP-PSAP connectivity
- ☐ OTHER technical costs: _____
- ☐ Training
- ☐ Personnel expenses

2006 Total Annual expenditures: _____ Expenditures

from Wireless Fund for each PSAP: _____ PSAP Name

☐ Tariffs

☐ Wireless Trunks

☐ Mapping Software Purchase/upgrade/interface/maintenance

☐ 9-1-1 CPE purchase/upgrade

☐ 9-1-1 related hardware purchase

☐ 9-1-1 software maintenance

☐ PSAP-PSAP connectivity

☐ OTHER technical costs: _____

☐ Training

☐ Personnel expenses

2007 Total Annual expenditures: _____ Expenditures

from Wireless Fund for each PSAP: _____ PSAP Name

☐ Tariffs

☐ Wireless Trunks

☐ Mapping Software Purchase/upgrade/interface/maintenance

☐ 9-1-1 CPE purchase/upgrade

☐ 9-1-1 related hardware purchase

☐ 9-1-1 software maintenance

☐ PSAP-PSAP connectivity

☐ OTHER technical costs: _____

☐ Training

☐ Personnel expenses

2008 Total Annual expenditures: _____ Expenditures

from Wireless Fund for each PSAP: _____ PSAP Name

☐ Tariffs

☐ Wireless Trunks

☐ Mapping Software Purchase/upgrade/interface/maintenance

☐ 9-1-1 CPE purchase/upgrade

☐ 9-1-1 related hardware purchase

☐ 9-1-1 software maintenance

☐ PSAP-PSAP connectivity

☐ OTHER technical costs: _____

☐ Training

☐ Personnel expenses

2009 Total Annual expenditures: _____ Expenditures

from Wireless Fund for each PSAP: _____ PSAP Name

☐ Tariffs

☐ Wireless Trunks

☐ Mapping Software Purchase/upgrade/interface/maintenance

☐ 9-1-1 CPE purchase/upgrade

☐ 9-1-1 related hardware purchase

☐ 9-1-1 software maintenance

☐ PSAP-PSAP connectivity

☐ OTHER technical costs: _____

☐ Training

☐ Personnel expenses

2010 Total Annual expenditures: _____ Expenditures

from Wireless Fund for each PSAP: _____ PSAP Name

☐ Tariffs

☐ Wireless Trunks

☐ Mapping Software Purchase/upgrade/interface/maintenance

☐ 9-1-1 CPE purchase/upgrade

☐ 9-1-1 related hardware purchase

☐ 9-1-1 software maintenance

☐ PSAP-PSAP connectivity

☐ OTHER technical costs: _____

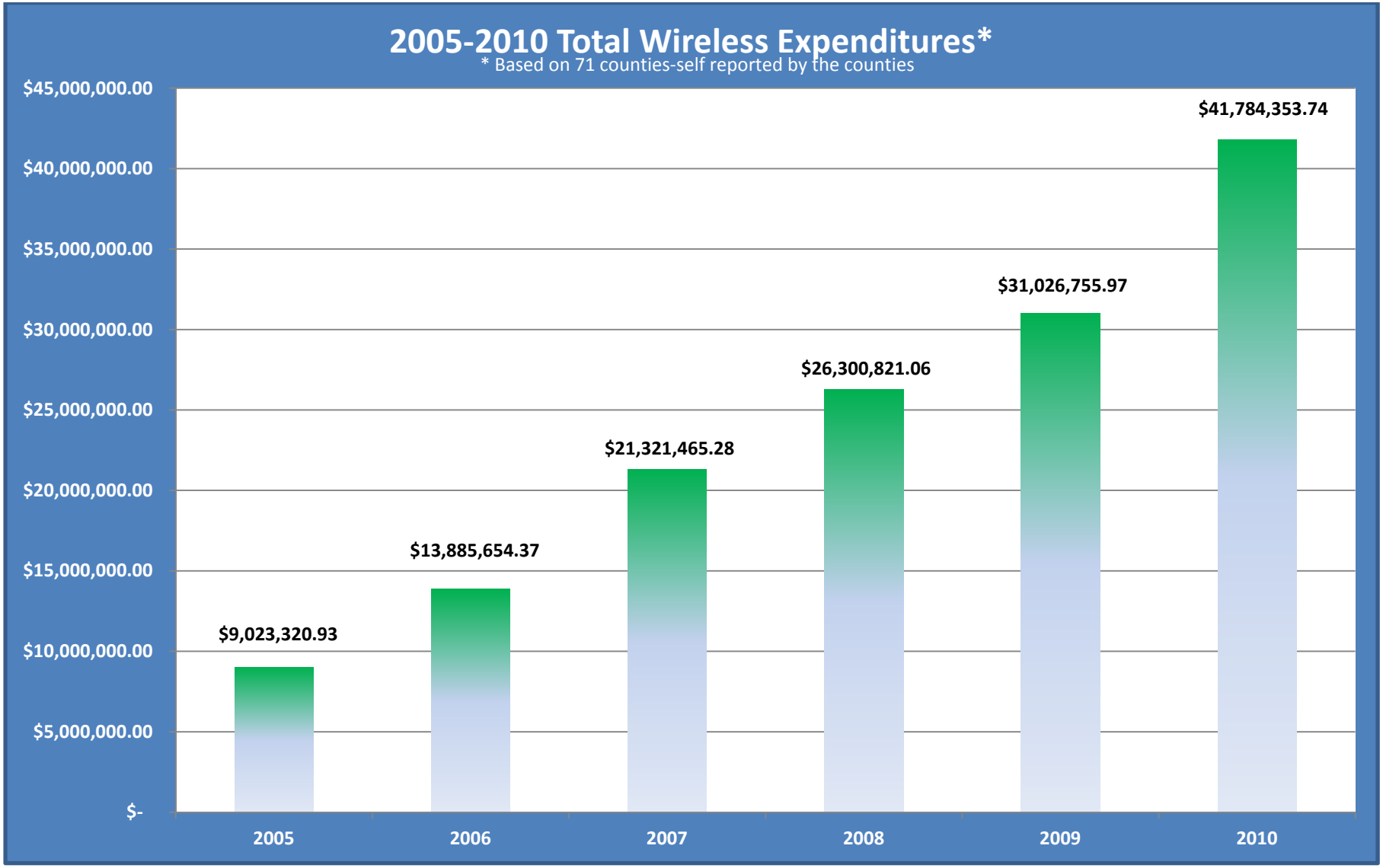
☐ Training

☐ Personnel expenses

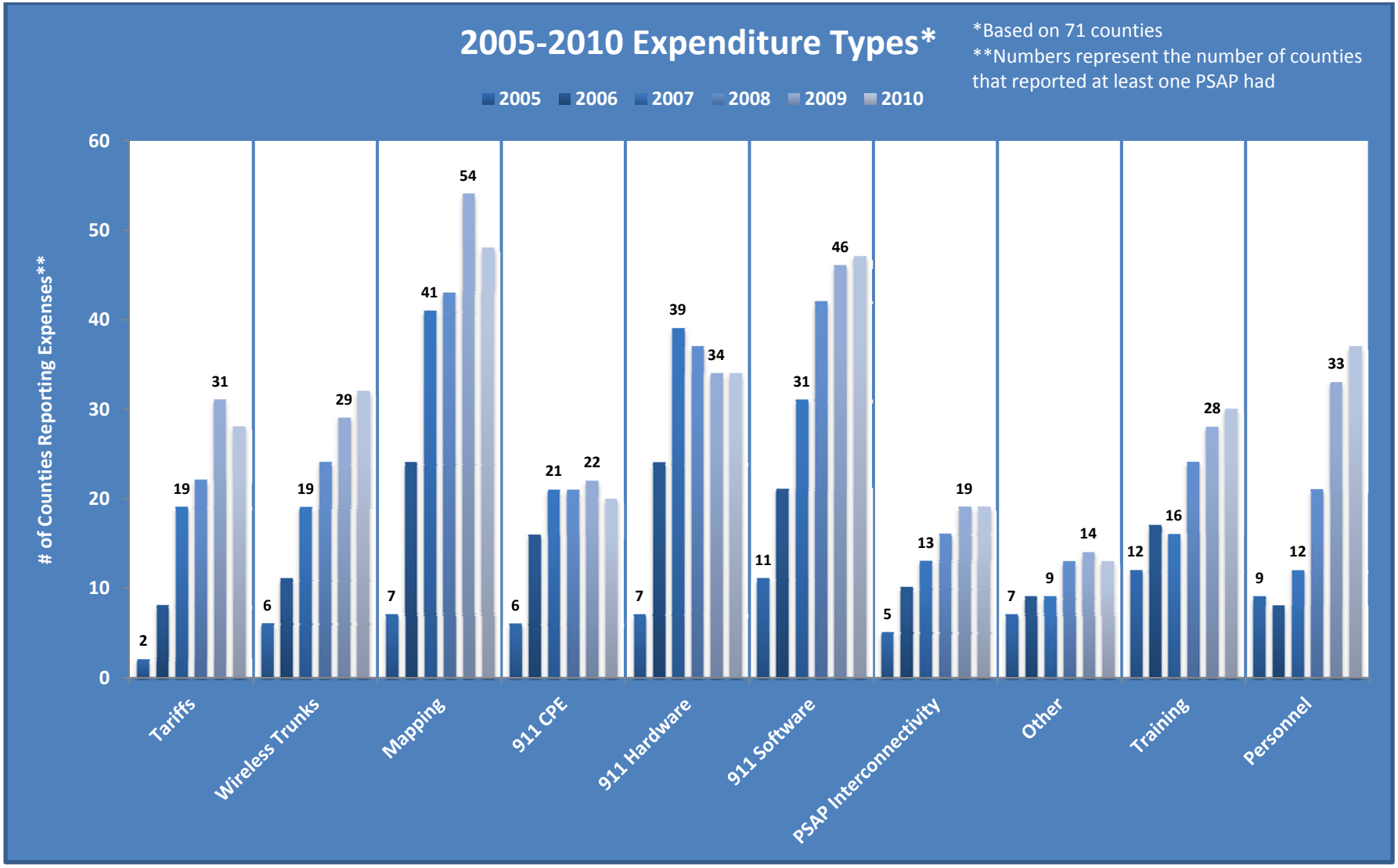
Projections (2011-2015)

In addition to the continuation of current expenditures, do you have any additional or adjusted projections regarding the wireless fund over the next four years? Please list examples and estimated cost per year of expenditure.

Appendix D-Wireless Expenditures



Appendix E-Expense Categories



Appendix F- Next Gen Workshop

Introduction

The nation's current 9-1-1 system has been an unqualified success, yielding critical emergency services nationally and for constituents and visitors of the state of Ohio. The current system, while effective, needs to evolve from the currently designed services which uses 40 year old telephone technology. This technology cannot effectively handle text, data, images, video, and other forms of multimedia communications prevalent in today's society.

Overview of Next Generation 9-1-1

Next Generation 9-1-1 (abbreviated NG9-1-1) refers to an initiative aimed at updating today's 9-1-1 service and infrastructure to improve all emergency communications services, not just 9-1-1. The National Emergency Number Association (NENA) identified the need for NG9-1-1 in 2000, and started development in 2003. Since 2006, the U.S. Department of Transportation (DOT) has been a key partner with NENA, through their NG9-1-1 Initiative, a research and development and proof of concept project aimed at advancing NG9-1-1.

NG9-1-1 will meet the needs of today's highly mobile wireless society, while developing flexible open standards based systems that will meet public safety needs well into the future. The system will enable the public to contact 9-1-1 from any phone or communications device, and allow one to send voice, text, images, video and data to the 9-1-1 Public Safety Answering Point, or PSAP. NG9-1-1 will allow sharing of this, and additional data, as well as emergency communications, with other PSAPs and Public Safety entities. These public safety entities range from traditional PSAPs, law enforcement, fire services, and EMS, to poison control centers, trauma centers, the Coast Guard, and disaster management centers.

NG9-1-1 allows for a truly interoperable means of sharing data, information, and communications with all other connected agencies. NG9-1-1 standards and requirements were, and are being, developed by NENA, along with other national and international standard

development organizations. NG9-1-1architecture is defined by the NENA “i3” series of Standards. NENA NG9-1-1 is a highly standardized system, seamlessly supporting communications, information sharing, and data transfer across county, state, and international borders.

NG9-1-1 is a system comprised of the set of network elements, software applications, databases, CPE components, and operations and management procedures required to provide next generation emergency service to:

- process all types of emergency calls including non□voice (multi□media) messages;
- provide standardized interfaces from call and message services;
- acquire and integrate additional data useful to call routing and call handling;
- deliver the calls / messages and data to the appropriate PSAPs and other appropriate ;emergency entities;
- support data and communications needs for coordinated incident response and management; and
- provide a secure environment for emergency communications.

Emergency Services Internet protocol network

The transport backbone of the NG9-1-1 system is the Emergency Services Internet protocol network(ESInet). The ESInet is a network of all PSAPs, public safety agencies, and related entities interconnected with each other through highly secure, IP based, managed, and redundant networks. This interconnected, inter-networked, “network of networks,” is shared by all authorized and security-validated, public safety agencies.

ESInets use broadband, packet switched technology capable of carrying voice and large amounts of varying types of data using Internet Protocol (IP) and open standards. ESInets are engineered, managed networks that are intended to be multi□purpose, supporting extended Public Safety communications services in addition to 9□1□1 (see Figure 1). ESInets are hierarchical, or a “network of networks” in a tiered design approach to support local, regional, state, and national emergency management authorities.

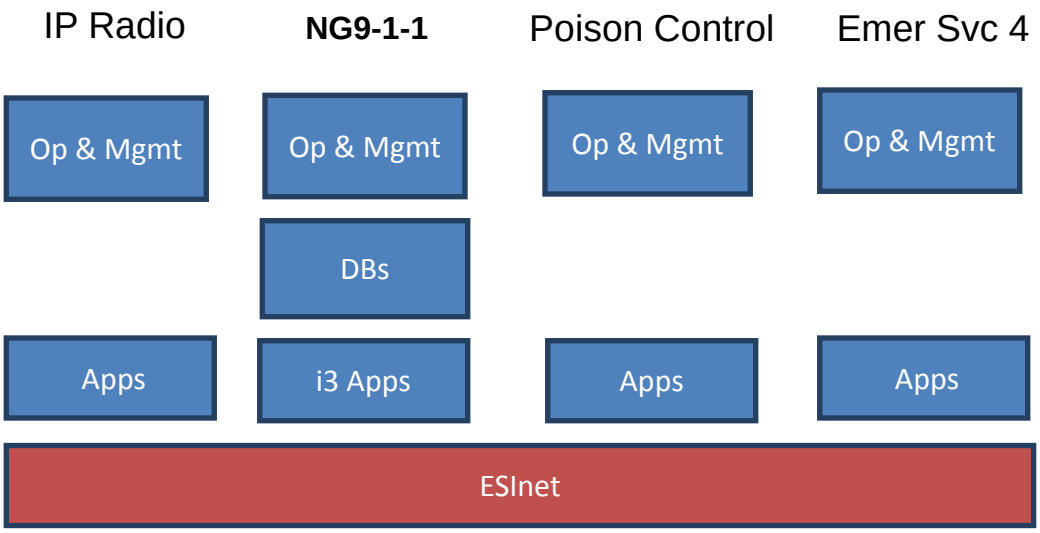


Figure 1 – multiple Emergency Services running on a common ESInet

The ESInets and NG9-1-1 are built upon open International Standards. The Internet Engineering Task Force (IETF) based IP protocol standards provide the basic functionality of the system. The IETF protocol standards are consensus standards incorporating requirements from a wide variety of nations, carriers, industry associations, and vendors. NENA has applied standards from IETF and other standards development organizations to specific NG9-1-1 requirements.

The ESInet will interconnect individual PSAPs, local and regional ESInets, and other emergency services networks in Ohio and beyond. NG9-1-1 will enable access to emergency services by any communication device regardless of its mobility or technology. This includes emergency calls using text, instant messages, voice, and video from handheld devices, laptop and desktop computers, wireless and wireline phones. NG9-1-1 will include the capability to accept information to improve response, such as an image of the scene of an accident, vehicular telematics data (where the vehicle provides location and crash data to the 9-1-1 center), a caller's medical records, or the building plans of the caller's location. NG9-1-1 will also enable the PSAPs and the public to receive up-to-date information, warnings, and/or instructions on large-scale events.

ESInets must be engineered and managed to provide the bandwidth necessary to carry the large volumes of data and information, for all PSAPs and other inter-connected agencies and entities in Ohio. The ESInet infrastructure must be easily scalable and extensible to allow for future growth and enhancements without interruption to service. The network infrastructure must

be public safety grade, meaning it must meet very high standards for security, availability, resiliency, reliability, and survivability.

Next Generation 9-1-1

The ESInet is the backbone, and the transport foundation of a Next Generation 9-1-1 system. NENA defines NG9-1-1 as:

A system comprised of Emergency Services IP networks (ESInets), IP-based Software Services' and Applications, Databases and Data Management processes interconnected to Public Safety Answering Point premise equipment.

- The system provides location-based routing to the appropriate emergency entity.
- The system uses additionally available data elements and business policies to augment PSAP routing.
- The system delivers geodetic and/or civic location information and the call back number.
- The system supports the transfer of calls to other NG9-1-1 capable PSAPs or other authorized entities based on and including accumulated data.
- NG9-1-1 provides standardized interfaces for call and message services, processes all types of emergency calls including non-voice (multi-media) messages, acquires and integrates additional data useful to call routing and handling for appropriate emergency entities.
- NG 9-1-1 supports all E 9-1-1 features and functions and meets current and emerging needs for emergency communication from caller to Public Safety entities."

In other words, NG9-1-1 is a system that maintains all the functionality of the current Enhanced 9-1-1 (E9-1-1) service, while allowing the evolution for 9-1-1 calls from any device, using any type of multi-media (text, instant messages, video, data only, or voice) to be delivered to the proper PSAP. (See Figure 2 below for a simplified diagram of NG9-1-1)

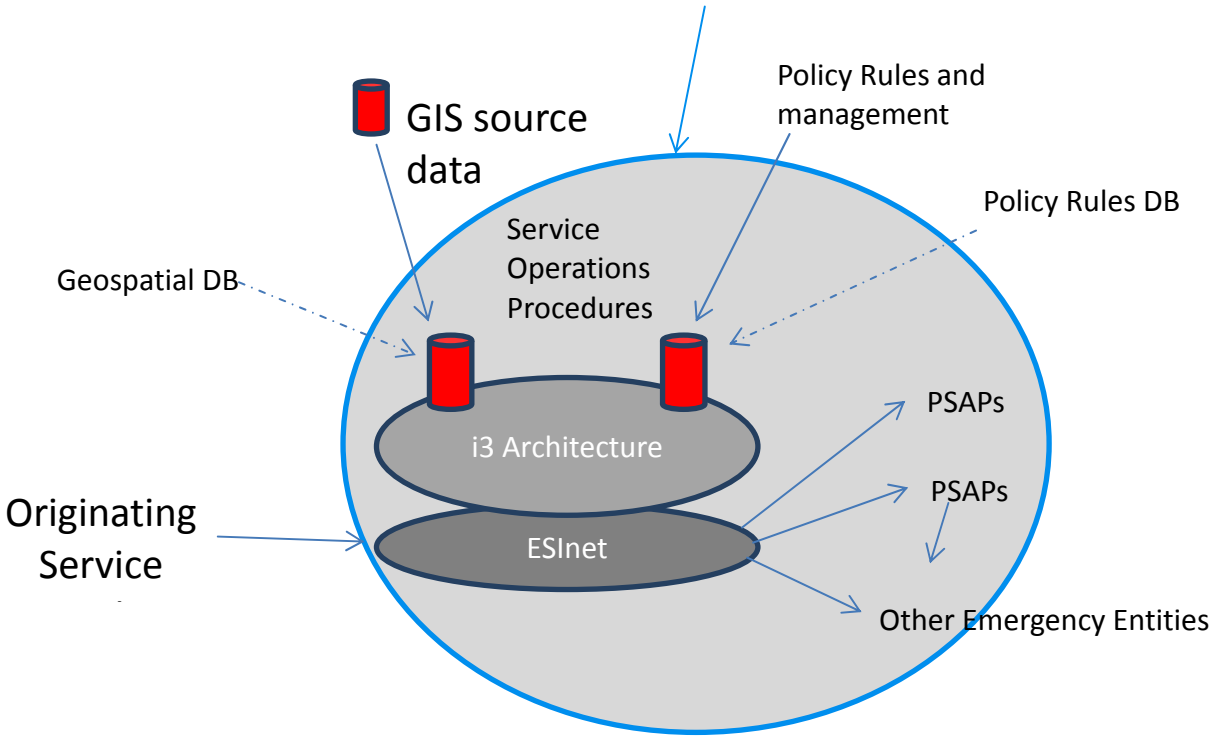


Figure 2

NG9-1-1 provides the integration, standards, interoperability, coordination, communication, cooperation, and collaboration to evolve into a unified system designed to improve all emergency services. NG9-1-1 will also:

- Provide standardized interfaces from call and message services.
- Process all types of emergency calls including non-voice (multi media) messages.
- Acquire and integrate additional data useful to call routing and handling.
- Deliver the calls/messages and data to the appropriate PSAPs and other appropriate emergency entities.
- Support data and communications needs for coordinated incident response and management.
- Provide a secure environment for emergency communications.
- Support much greater data handling capabilities.
- Facilitate 9-1-1 call and data sharing between any emergency service entities.
- Allow more options for contingency planning and disaster recovery.

- Provide a robust, redundant, and secure statewide emergency network.
- Provide equal access for all 9-1-1 callers, including the deaf community.
- Access a wide range of data to improve emergency response.
- Allow emergency responders to be better prepared for situations prior to arriving on the scene, potentially saving more lives.
- Provide true interoperability with all verified and certified emergency services entities.

Core NG9-1-1 Functional Elements

At the core of the NG9-1-1 is the ability to properly route and handle 9-1-1 calls to the correct PSAP. The core functionality, often called the core functional elements, includes the following:

- Border Control Function (BCF)
- Emergency Services Routing Proxy (ESRP)
- Emergency Call Routing Function (ECRF)
- Policy Routing Function (PRF)
- Location Validation Function (LVF)
- Relevant Databases

Each of the core functional elements work together to form the call and data processing capabilities of NG9-1-1. Each individual element has its own distinct function.

Border Control Function (BCF)

The ESInet must be connected to the Internet through the Border Control Function (BCF) to accept calls. Part of the function of the BCF is to monitor, scan, and prevent malicious and deliberate attacks. The BCF scans and eliminates malware attacks, provides access control, permission and denial management, blocks unusual incoming data, prevents denial of service attacks, exerts control over data flow, opens and closes the firewall, and protects and controls external information and data from entering the ESInet. In addition to the layers of security and

protection the BCF provides, it also controls the signaling and the media streams involved in 9-1-1 calls.

Emergency Services Routing Proxy (ESRP)

The Emergency Services Routing Proxy makes the decisions on where to send a 9-1-1 call. The ESRP determines routing of the call from the information provided by the Emergency Call Routing Function and applies any Policy Rules that may alter the routing of the call. The ESRP queries the Emergency Call Routing Function to determine which PSAP to route the 9-1-1 call to, based on the GIS data contained in the Emergency Call Routing Function databases. The ESRP then queries the Policy Routing Function to determine if it needs to re-route the 9-1-1 call based on policy.

Emergency Call Routing Function (ECRF)

In NG9-1-1, the location of the 9-1-1 call is included or acquired when a call is made to 9-1-1. The Emergency Call Routing Function (ECRF) contains the local 9-1-1 GIS data that is used to pre-validate the location of the device (see LVF) prior to a 9-1-1 call being made. Once a 9-1-1 call is made, the same GIS data is used to determine the correct PSAP for call routing. The ECRF is also used by the PSAP to determine appropriate responders for an emergency call based on the location of the caller.

Policy Routing Function (PRF)

Policy Rules are stored and evaluated using the Policy Routing Function, or PRF. Policy Rules are evaluated with the Emergency Services Routing Proxy (ESRP). Policy is a set of rules that can be created by the local 9-1-1 Authority to allow dynamic and automated re-routing of calls based on certain conditions or criteria. Policy Rules can modify the normal routing of a 9-1-1 call. Policy may be written to re-route 9-1-1 calls based on overload conditions existing at a PSAP; the number of calls in a call queue; an out-of-service condition such as scheduled maintenance, scheduled upgrade, network or equipment failure; or almost any number of

possible reasons. Policy Rules can automate processes that are not possible in today's E9-1-1 system.

Location Validation Function (LVF)

Before a call is ever placed, the location associated with the calling device is pre-validated. The validation of this location uses the 9-1-1 Authority's locally derived GIS data. Once validated, the location will become part of the 9-1-1 call.

Relevant Databases

Databases are a key component of NG9-1-1. These databases store a variety of data and enable numerous functions. Each database serves a specific function including:

- Security
- Access and Control
- Location Validation
- Call Routing
- Policy Rules
- Identity and Management Rights
- Call Records
- Logging

In addition, there area a number of human procedures involved in managing and maintaining the NG9-1-1 capabilities, from ESInet management and troubleshooting to database management and exception resolution, as well as revised or new PSAP operations procedures.

Conclusion

The NG9-1-1 environment will differ considerably from the current 9-1-1 environment. NG9-1-1 will require an overhaul of all aspects of 9-1-1 from governance to the delivery of services. Conceptually, transition begins with build out of the ESInets, followed by the

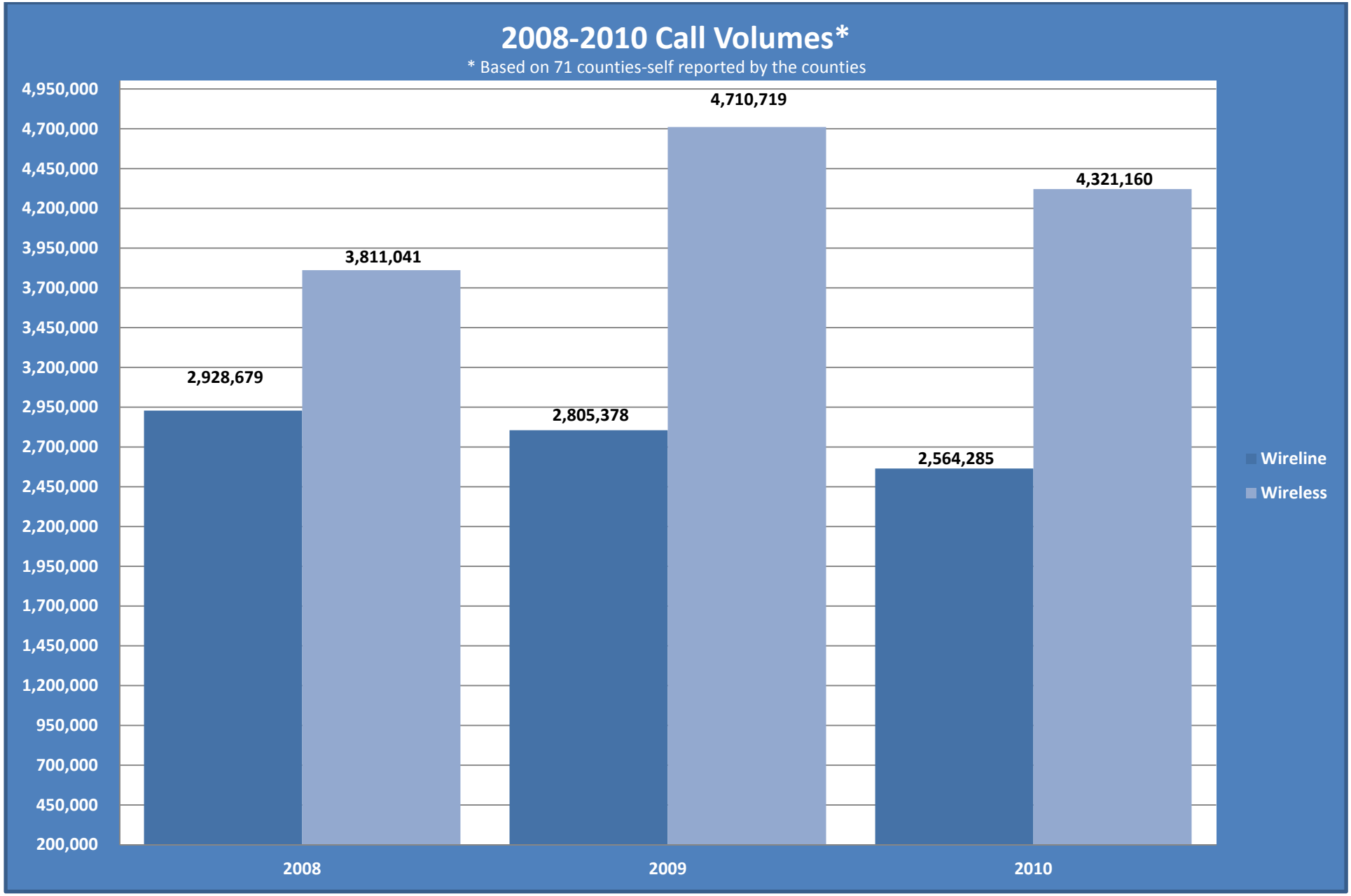
implementation of the software and database applications that provide next generation 9-1-1 functionality. The planning and transition to NG9-1-1 can be an extensive, multi-year effort.

Ideally, there would be a state ESInet administration and management process that will interconnect regional ESInets and individual PSAPs. The combined ESInet will enable call access, transfers and backups among and between PSAPs. It will also allow flexibility in call-taking such that call takers no longer will have to be physically constrained to a specific communication center. Additionally, the ESInet will enable access to and backups from other emergency services organizations.

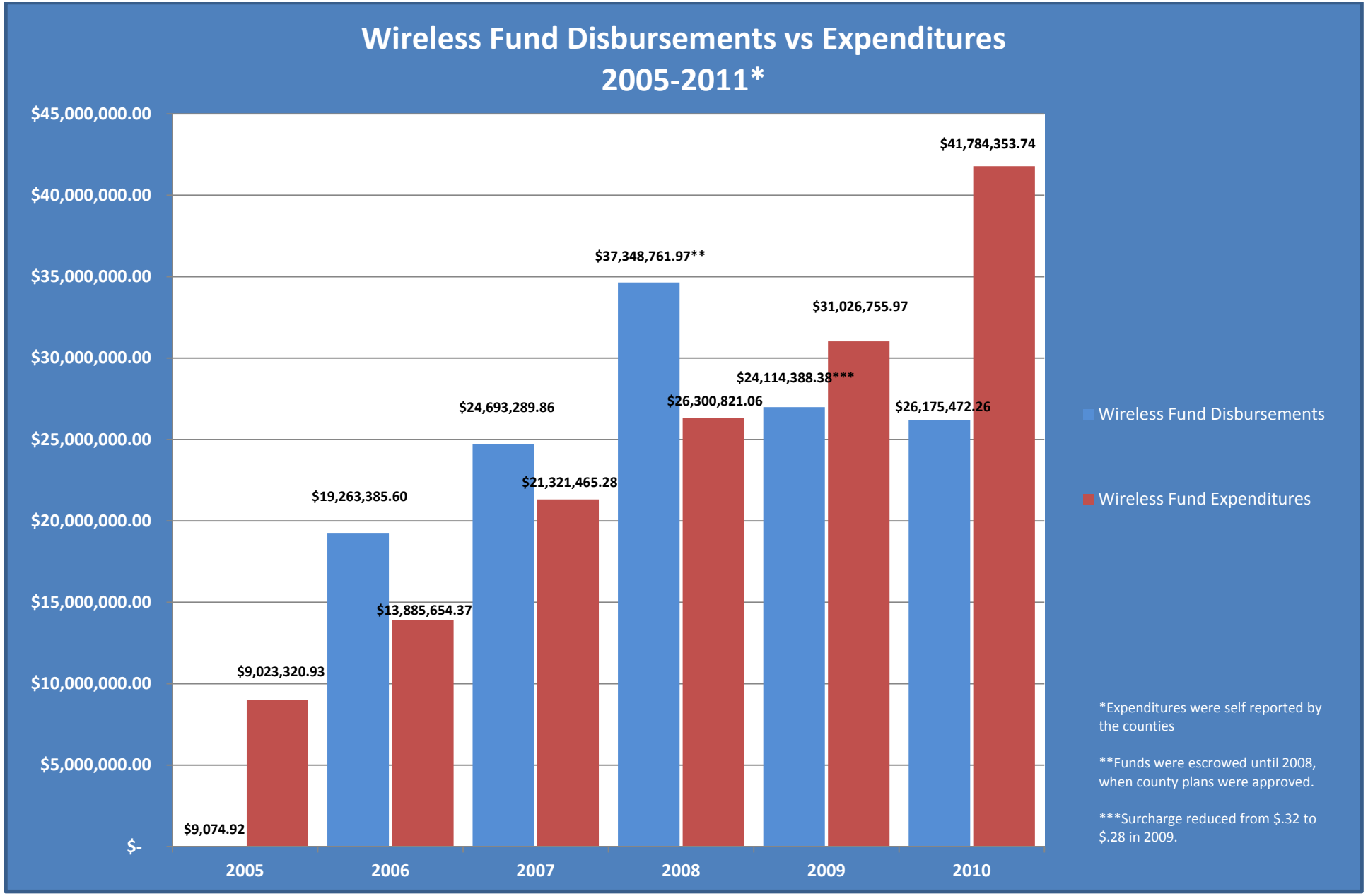
The roles and responsibilities of 9-1-1 stakeholders from PSAPs to state government will likely evolve as NG9-1-1 matures. This will facilitate the definition of roles and responsibilities of local, regional and state government through stakeholder involvement.

Implementation of NG9-1-1 will entail significant investment, longer range cost savings, detailed planning, and close cooperation among the public and private sector entities responsible for the operation of 9-1-1 systems. Implementation presents both opportunity and challenge. The opportunity lies in the ability to expand and enhance a vital public safety service and increase efficiency. The challenge will be to marshal the resources required to effect the change.

Appendix G-Call Volumes



Appendix H-Wireless Disbursements vs. Expenditures



Appendix I-Tariffs

Company	Nonrecurring Charge	Recurring Charge	Billing Unit Defined
AT&T	$119.32 per billing unit	$7.90 per billing unit	1 Billing Unit= 1000 population
CenturyLink (Previously Embarq)	$3,500 per PSAP	$250 per PSAP	1 Billing Unit= 1 PSAP
Frontier (Previously Verizon)	N/A	$36.66 per billing unit	1 Billing Unit= 1000 Call Units
CBT	$92.01 per billing unit	$16.05 per billing unit (maintenance)	1 Billing Unit = 100 Call Blocks
New Knoxville	Negotiated contract with Auglaize County	Negotiated contract with Auglaize County	N/A
Windstream Ohio	$100.50 per billing unit (Phase I) $107.00 per billing unit (Phase II)	$10.75 per billing unit for Phase I, $1.05 per billing unit for Phase II	1 Billing Unit= 1000 population
Windstream Western Reserve	$100.50 per billing unit (Phase I) $107.00 per billing unit (Phase II)	$10.75 per billing unit for Phase I, $1.05 per billing unit for Phase II	1 Billing Unit= 1000 population