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Executive Summary

The *Code of Virginia* (§56-484.14) requires the E-911 Services Board (the Board) to report annually to the Governor, the Senate Committee on Finance, the House Committee on Appropriations, and the Virginia State Crime Commission on the following:

- (i) the state of enhanced 9-1-1 services in the Commonwealth,
- (ii) the impact of, or need for, legislation affecting enhanced 9-1-1 services in the Commonwealth,
- (iii) the need for changes in the E-911 funding mechanism provided to the Board, as appropriate, and
- (iv) monitor developments in enhanced 9-1-1 service and multi-line telephone systems and the impact of such technologies upon the implementation of Article 8 (§ 56-484.19 et seq.) of Chapter 15 of Title 56.

The state of enhanced 9-1-1 services in the Commonwealth

All localities within the Commonwealth currently provide wireline E-911 service.

The deployment of wireless enhanced 9-1-1 (E-911) Phase I service, where the caller's telephone number and the address of the cell site are provided to the public safety answering point (PSAP), is complete. The deployment of wireless E-911 Phase II, which provides the PSAP with the caller's actual location by longitude and latitude, is also complete.

The focus of the E-911 industry has shifted to the future of E-911, which is Internet-Protocol (IP) - based communications, known as Next Generation 9-1-1 (NG9-1-1)¹. In 2009, the E-911 Services Board provided funding for four NG9-1-1 demonstration projects in the Tidewater, Southside, Southwest and the New River Valley regions of the Commonwealth. Recently, the Board undertook a comprehensive feasibility study that will provide recommendations for the design of a single statewide IP-based 9-1-1 network in the Commonwealth.

The Board has also established a Text to 9-1-1 Subcommittee to evaluate texting to 9-1-1 as a statewide initiative and to provide recommendations on how to support this initiative in a white paper. Support for the NG9-1-1 feasibility study and the Text to 9-1-1 white paper is being provided by the PSC Division.

The impact of, or need for, legislation affecting enhanced wireless emergency telecommunications services in the Commonwealth

The E-911 Services Board is anticipating legislative changes for the 2015 General Assembly session. These legislative changes will be finalized by the Board's Policy Subcommittee and will be

¹ NG9-1-1 is an IP-based system comprised of managed IP-based networks (ESInets), functional elements (applications), and databases that replicate traditional E9-1-1 features and functions and provide additional capabilities. NG9-1-1 is designed to provide access to emergency services from all connected communications sources, and provide multimedia data capabilities for PSAPs and other emergency service organizations

based on recommendations included in the NG9-1-1 feasibility study and the Text to 9-1-1 white paper.

An important component within the NG9-1-1 feasibility study is the identification of key policy, governance, and political considerations related to the implementation of a statewide IP network. As a result, the study will provide policy and governance recommendations, as well as a review of the existing enabling legislation to identify opportunities for positive change to the legislation. The end result will be a multi-year legislative agenda, with the initial focus on governance for the 2015 session.

The Board's Text to 9-1-1 Subcommittee will provide recommendations on texting to 9-1-1 as a statewide initiative. It is anticipated that the Subcommittee's recommendations will not require legislative changes, but until the Subcommittee completes its report, the need for legislative change will not be known.

The need for changes in the E-911 funding mechanism provided to the Board, as appropriate

At the end of FY 2014, the Wireless E-911 Fund remains fiscally sound. However, moving forward, an existing appropriation and transfer from the Wireless Fund to other agencies and programs will challenge the Board's ability to meet financial obligations to both the wireless carriers and the PSAPs and maintain the viability of the Fund. The current biennial budget includes a \$3.7 million appropriation to the State Police for wireless 9-1-1 call taking. However, all localities in the Commonwealth are currently accepting wireless calls and no longer rely on the Virginia State Police (VSP) to transfer wireless 9-1-1 calls to them. Thus, the justification for the VSP to receive Wireless E-911 funding no longer exists.

Also included in the current biennium budget is an \$8M transfer from the Wireless Fund to the Compensation Board's budget to support sheriff's dispatchers. This action may impact the Commonwealth's ability to receive federal E-911 grant funding in the future. However, the impact of the \$8M transfer has already been felt by the PSAP community in the amount of funding available to them for the replacement of outdated equipment and to expand services to the citizens of the Commonwealth. The \$8M transfer to the Compensation Board means that there is \$8M less funding available for future PSAP Grant Program grants to fund critical PSAP projects, as well as to plan for NG9-1-1.

Monitor developments in enhanced 9-1-1 service and multi-line telephone systems

This is a duty of the Board that was enacted on July 1, 2007. Most of the provisions of Article 8 (§ 56-484.19 et seq.) of Chapter 15 of Title 56 took effect on July 1, 2009, and information requested on these provisions is provided to interested parties.

PSC staff has begun working on the next edition of the Statewide Comprehensive Plan for 9-1-1. This plan will focus on NG9-1-1 and texting to 9-1-1, but it will also present an opportunity to evaluate additional developments currently impacting 9-1-1 call taking, including multi-line telephone systems.

The following sections of the report provide a more detailed analysis of the current state of E-911 in the Commonwealth, as well as the Wireless E-911 Fund.

State of Enhanced 9-1-1 in the Commonwealth

Wireline E-911

Originally, 37 jurisdictions were eligible for funding, because they had not fully deployed E-911 as of July 1, 2000. All of these localities have now deployed E-911 Service.

Wireless E-911

The number of wireless 9-1-1 calls has continued to grow rapidly since wireless service was introduced commercially in 1985. Though the rate of growth has slowed in recent years, the number of wireless 9-1-1 calls continues to surpass the number of wireline E-911 calls in many Virginia localities. Through the 1990's, a 9-1-1 call placed from a wireless telephone would simply be forwarded to a 10-digit telephone number that went to the local PSAP or to the state police. Coming in on a 10-digit number meant that the location of the caller, call back number and other important data elements were not provided like they were for wireline E-911. This lack of an automatic location resulted in more time for the call taker to process the call or an inability to locate the caller at all. Several incidents were documented around the country that demonstrated the problems PSAPs were having locating a wireless 9-1-1 caller.

To respond to this issue, in 1996, the Federal Communications Commission (the Commission) released an order requiring wireless service providers to implement enhanced features and location technology. The implementation was to occur in two phases. Phase I provided the PSAP with the caller's telephone number and the address of the cell site receiving the call along with the orientation of the antenna, if the antenna is directional. Phase II provided the PSAP with the actual location of the caller within a defined margin of error depending on the location technology used by the provider (Figure 1). According to the order, the wireless service provider had to implement Phase I within six months of a request from the PSAP. The timeline for Phase II was contingent on the location technology selected by the wireless service provider, network-based (triangulation) or handset-based (global positioning system – GPS).

One outstanding issue has been over what area the accuracy of Phase II is to be measured. There was stark disagreement between the wireless and E-911 industry leadership on the appropriate area for testing. Because the two location technologies perform differently in different environments, the best alternative for the wireless providers was to have a large test area (nationwide or statewide). This would allow the performance of their solution to be “averaged” across a variety of these environments providing a more general evaluation of the solution's performance. The E-911 community felt the test area should be limited to each PSAP service area thus providing each PSAP manager with an indication of how the location technology performed in their area. This would also provide assurances that the wireless provider was providing a similar level of performance in all different environments.

In September 2010, the Commission adopted benchmarks for wireless carriers to meet these handset- and network-based accuracy thresholds at the county or PSAP level for increasing percentages of 9-1-1 calls over an eight-year period. Three years ago, the Commission went further and announced that after the conclusion of the eight-year implementation period in early 2019, it will sunset the existing network-based rule and

Phase II Accuracy

Network based solution:

Accuracy

- 100 meters 67% of the time
- 300 meters 95% of the time

Handset based solution:

Accuracy

- 50 meters 67% of the time
- 150 meters 95% of the time

Figure 1 - FCC Phase II Requirements

require all wireless carriers to meet the more stringent location accuracy standards in the handset-based rule. At this time a specific sunset date has not been identified, but these more stringent standards may generate additional costs for which the carriers will seek reimbursement. Furthermore, there have been continued discussions at the Commission to establish indoor location accuracy requirements, which may also result in cost reimbursement claims. Until a ruling is made by the FCC, it is premature for cost projections to be made.

Phase I Project Status

To date, all localities have implemented wireless E-911 Phase I (call back number and cell site location) with all of the wireless service providers serving the locality.

Phase II Project Status

To date, all localities have implemented wireless E-911 Phase II (caller location) with all of the wireless service providers serving the locality.

Wireless Responsibility

Section 56-484.16 of the *Code of Virginia* makes clear the General Assembly's intent that wireless 911 calls be answered by the local PSAP where the call is initiated instead of by the State Police. The *Code* required that by July 1, 2003, all localities be directly taking the wireless 911 calls made within their jurisdiction. Rather than just taking the call as required by Code, many localities opted to deploy Phase I instead. As a result, the success with Phase I deployment translated into success with moving the calls from the State Police to the local PSAP. Presently, all localities are now accepting all of their wireless 911 calls.

State of the Wireless E-911 Fund

Wireless E-911 Fund

The Wireless E-911 Fund is generated by a \$0.75 monthly surcharge collected from each wireless customer whose place of primary use is in Virginia. One question the Board is asked annually is whether the surcharge rate should be adjusted. The current funding process is to distribute the majority of the Wireless E-911 Fund based on a formula and the sufficiency of the surcharge is best evaluated against two criteria.

First, 30% of the Wireless E-911 Fund is earmarked for wireless services cost recovery. This percentage was established through a legislative change in 2006 and was based on the known, on-going costs of the wireless service providers. Historically, the providers have collected approximately 26% of the Fund and the current percentage has proven sufficient to fund the known, on-going costs of the providers. However, in the current biennium budget there is an \$8M transfer from the portion of the Wireless E-911 Fund that is earmarked for wireless cost recovery to the Compensation Board. The intent of this transfer is to pay for Sheriffs' dispatchers. In FY 2014 sufficient funding was available from the remaining portion of this earmark to pay all wireless service cost recovery requests, but in future years this may not be the case, especially when considering forthcoming compliance testing guidelines from the FCC.

The second criterion for evaluating the sufficiency of the surcharge is the potential impact to PSAP funding. The localities have come to rely on the wireless E-911 funding source to operate and

maintain their PSAPs. Any reduction to the overall funding would be detrimental to service delivery. The surcharge rate must be sufficient so that the distribution formula results in consistent funding to the locality. Historically, the PSAPs have received 48% of the Wireless Fund for recurring and operational costs. The current funding process distributes 60% of the Fund to the PSAPs. This percentage was established through a legislative change in 2006 and has resulted in an increase in the overall amount of funding to the PSAPs. However, not all PSAPs have benefited equally. Those PSAPs located within the fastest growing localities have received a greater portion of the fund than those PSAPs located in the slower growing localities. Many PSAPs, mostly small and rural, have experienced a significant decrease in funding since the current funding distribution methodology was put into place in 2006.

To provide insight into this trend, the Board established a Wireless Funding Committee in September 2009 to review the Wireless Fund distribution methodology, and if appropriate, recommend changes, which were made in the 2011 General Assembly session. These changes focused on smoothing out data anomalies and better aligning the funding cycle with local budgeting processes. More recently, changes were made as part of the Governor's Commission on Government Reform and Restructuring. In the 2012 General Assembly session, a change was made to how the 60% of the Fund is distributed to PSAPs. Beginning July 1, 2012, 60 % of the Wireless E-911 Fund is be distributed to the PSAPs monthly by the Department of Taxation according to each PSAP's average pro rata distribution from the Fund for fiscal years 2007-2012, "taking into account any funding adjustments made pursuant to" any audit performed by the Board. The current distribution percentages will be recalculated on or before July 1, 2017, but there is already interest within the PSAP community to forecast the impact of the upcoming recalculation on current distribution percentages.

In July 2011, the E-911 Services Board directed staff to validate the call load and cost data submitted by any PSAP having a large variance in their data from FY2008 to FY2009 or FY2009 to FY2010. This data sampling was done in response to the APA audit conducted in FY 2010. In January 2012, the results of the initial validation were presented to the Board and staff was directed to validate all data submitted by the PSAPs for FY2009 and FY2010. The final validation results were presented to the Board at their July 2012 meeting. At this meeting, the decision was made to correct all funding for this period, impacting PSAP funding for the next five years.

And finally, although not directly related to the sufficiency of the surcharge, financial assistance is also available to the PSAP community through the E-911 Services Board's PSAP Grant Program. This program was included in the 2006 legislative changes and is funded by the remaining 10% of the Wireless Fund and any remaining carrier funding from the previous fiscal year. As a result of the \$8M transfer from the portion of the Wireless E-911 Fund that is earmarked for wireless cost recovery to the Compensation Board, the amount of funding available since FY 2011 has been significantly reduced.

Funding Levels

In order to appropriately analyze the effects of the current funding methodology, it is necessary to review the funding levels for both the wireless carriers and the PSAPs. The total amount of funding received by the carriers for the recovery of costs incurred during FY 2014 was \$3,217,093. This amount is well within the 30% of the Wireless Fund set aside for this purpose, which in FY 2014, was \$13,085,643. Any remaining funding in FY 2013 was transferred into the PSAP Grant Program for the FY 2014 funding cycle. The PSAPs received a total of \$26,171,287 through the 60%

formula distribution and were allocated another \$5,386,812 from the FY 2014 PSAP Grant funding cycle. This amount is significantly more than the \$4,171,584 allocated in FY 2013. As a result, in FY 2014 the PSAPs received a total of \$31,558,099. Compared to FY 2013, when the PSAPs received a total of \$29,802,209, the overall result is an increase of 5.9% in funding to the PSAPs.

Ensuring an appropriate funding level into the future requires sufficient revenue to be generated. Since the actual revenue for FY 2014 was about \$53.7 million, each penny of surcharge collected generates approximately \$716,000 of revenue annually. It is important to note that there are other draws on the Wireless E-911 Fund that reduce the amount of funding available to the PSAPs and the wireless service providers. The Division of Public Safety Communications (PSC), a portion of the Virginia Geographical Information Network (VGIN) Division, and centralized billing agreements for PSAP wireless 9-1-1 services with Verizon and CenturyLink are funded through Wireless E-911. Since this funding is contained in the Appropriation Act, it is subtracted before the distribution of funding based on the formulas, thus evenly reducing the amount of funding across the three funding programs.

In addition to the \$8M transfer from the Wireless Fund to the Compensation Board, the current biennial budget also includes a \$3.7 million appropriation to the State Police for wireless 9-1-1 call taking. Just like the \$8M transfer, this appropriation reduces the amount of funding available to the PSAPs and wireless service providers. This appropriation was originally established to provide funding to transfer wireless 9-1-1 calls from the State Police dispatch centers to the local PSAPs. However, all localities in the Commonwealth are currently accepting wireless calls and no longer rely on the State Police to transfer wireless 9-1-1 calls to them. Thus, justification for the State Police receiving Wireless E-911 funding no longer exist and could jeopardize the Commonwealth's ability to receive federal funding in the future.

Additionally, federal legislation was signed into law on December 23, 2004 that requires states that apply for federal E-911 grant funding (or the PSAPs within the states), to certify that no E-911 funding was diverted to other areas. A state that has diverted funding shall be ineligible for federal funding for 18 months after the diversion. The \$8M transfer from the Wireless Fund to the Compensation Board may be considered a diversion and may impact the Commonwealth's ability to receive federal E-911 grant funding in the future.

Wireless Funding Process

The E-911 Services Board began providing funding to PSAPs and wireless service providers in FY 2000. Since FY

FY	PSAP Funding	Wireless Provider Funding
2000	\$4,316,115	\$396,144
2001	\$7,047,639	\$1,862,736
2002	\$13,930,840	\$3,719,132
2003	\$18,861,283	\$5,288,230
2004	\$16,015,454	\$8,361,966
2005	\$20,086,422	\$8,106,850
2006	\$18,680,037	\$5,371,059
2007	\$25,443,756	\$5,019,411
2008	\$30,858,208	\$5,399,847
2009	\$36,275,235	\$5,078,528
2010	\$42,693,511	\$4,251,126
2011	\$27,610,503	\$4,326,989
2012	\$28,317,542	\$3,823,170
2013	\$29,802,209	\$3,145,601
2014	\$31,558,099	\$3,217,093
Total	\$351,396,853	\$67,367,882

Figure 2 - Wireless E-911 Funding History

2000, the Board has approved the distribution of over \$351.4 million to localities and over \$67.4 million to the carriers. The amount of funding increased each year as more localities moved to

implement the service and more deployments occurred (Figure 2). However, in the most recent fiscal years, the amount of funding has stabilized. As the costs have become more stable, the PSAPs have begun receiving a more constant funding level, which is primarily comprised of personnel funding. As a result, in FY 2006, the Board recommended a legislative change to implement its current formula-based funding process for the PSAPs. These changes were codified with the passage of Senate Bill 395 during the 2006 General Assembly session.

This current approach to funding splits the Wireless E-911 Fund into three parts. The first part is a 60% allocation to be distributed to the localities for PSAP operations. Beginning July 1, 2012, this portion of the E-911 Fund is distributed to the PSAPs monthly by the Department of Taxation according to each PSAP's average pro rata distribution from the Fund for fiscal years 2007-2012. The 60% allocation represents an overall increase of funding to the PSAPs since historically they received approximately 46% of the fund for recurring costs. However, while this funding replaces the funding provided for recurring costs of wireless E-911, it may not cover the non-recurring costs such as equipment replacement. The projected increase in funding (the difference between 46% and 60%) will likely address these non-recurring costs (over the life cycle of the equipment) in larger localities, it will not in many smaller localities. As a result, the Board also recommended the creation of another partition of the Wireless E-911 Fund, the E-911 PSAP Grant Program.

The E-911 PSAP Grant Program utilizes a 10% allocation of the Wireless E-911 Fund and is intended to assist the localities with the most need. While the legislation provides the Board with great latitude in the adoption of grant guidelines, the grant focus will be on equipment upgrades and ensuring continuity of the wireless E-911 service into the future. The Board formed a grant committee to develop grant guidelines as soon as the legislation was approved to ensure that funding would be available to the localities as quickly as possible. Logistically, the Board was not able to implement the full grant process until the FY 2008 funding cycle, but the Board accepted emergency grant requests in FY 2007 to ensure that no locality would lose funding during the transition from the old process to the new.

In addition to the 10% allocation of the Wireless E-911 Fund, the grant program will also receive the remaining funding from the portion of the Fund earmarked for CMRS Cost Recovery. Wireless service providers can seek cost recovery for direct and reasonable costs for the deployment and operation of the wireless E-911 network. Since 60% of the Wireless E-911 Fund is distributed to the localities and 10% is allocated for PSAP grants, 30% remains for this part of the Fund allocation. Any funding remaining in this part of the Fund at the end of the fiscal year will be transferred to the grant program. Any funding remaining in the grant program at the end of the fiscal year will be distributed to the localities in the same manner as the 60% part of the Fund; however, the Board may retain any or the entire amount if a specific need is identified in the next fiscal year.

In FY 2014, the amount of PSAP grant awards totaled \$5,386,812. When compared to the amount of grant awards made in FY 2013, which was \$4,171,584, a thirty percent increase in funding occurred. However, this is significantly less than the \$15,945,527 in grant awards that were awarded in FY 2010. The main reason for this decrease is the \$8M that is transferred from the Wireless E-911 Fund to the Compensation Board. Despite the decrease in funding, the PSAP Grant Program continues to provide critical 9-1-1 equipment and services to the PSAPs. Unfortunately, funding has not been available for the past four years for 9-1-1 enhancement projects, which are dedicated to testing future 9-1-1 technologies.

The Commonwealth's 9-1-1 system must keep pace with technology, which is progressing at an unprecedented rate. Text messaging is becoming a more common method of communicating than traditional two-way voice communication and is a leading issue within the 9-1-1 community. Pictures and videos are increasingly shared through the use of smart phones. And, video and text based communications has become the default medium for the deaf and hard of hearing. In order to support the current and future needs of Virginia citizens, the planning process for an IP-based communications system, known as NG9-1-1, must continue.

Efforts to promote NG9-1-1 technology received a boost from a \$1M matching grant from the ENHANCE 911 Grant Program, offered through the National Highway Traffic Safety Administration, and awarded on September 25, 2009. This funding was used to support four NG9-1-1 demonstration projects in the Tidewater, Southside, Southwest and the New River Valley regions of the Commonwealth. The focus of these projects was to test the various technical components, and related issues, of a NG9-1-1 network. Furthermore, the E-911 Services Board has authorized funding to undertake a comprehensive feasibility study that will provide recommendations for the design of a single statewide IP-based 9-1-1 network in the Commonwealth.

Text to 9-1-1 is no longer a capability that is on the horizon; it has become part of our 9-1-1 reality. The Federal Communications Commission (FCC) has taken steps to promote the national roll out of texting to 9-1-1. At present, there have only been four deployments in Virginia, but PSAPs have expressed a strong interest in providing Text to 9-1-1 service to their citizens and more are planned. As a result, PSAPs will need resources to support their efforts. To this end, the E-911 Services Board has established a Text to 9-1-1 Subcommittee to evaluate texting to 9-1-1 as a statewide initiative and to provide recommendations in a white paper. Support for the NG9-1-1 feasibility study and the Text to 9-1-1 white paper is being provided by the PSC Division.

The PSC Division has also begun working on the next edition of the Statewide Comprehensive Plan for 9-1-1. This plan will focus on NG9-1-1 and texting to 9-1-1, but it will also present an opportunity to evaluate additional developments currently impacting 9-1-1 call taking.

Conclusion

The members of the E-911 Services Board continue to be effective in their role of promoting and assisting with the deployment of enhanced 9-1-1 services throughout the Commonwealth. As a result, Virginia continues to be a nationally recognized leader in E-911. The next undertaking for the Board will be a comprehensive feasibility study that will provide recommendations for the design of a single statewide IP-based 9-1-1 network in the Commonwealth. The Board has also established a Text to 9-1-1 Subcommittee to evaluate texting to 9-1-1 as a statewide initiative and to provide recommendations on how to support this initiative in a white paper.

The E-911 Services Board is anticipating legislative changes for the 2015 General Assembly session. These legislative changes will be finalized by the Board's Policy Subcommittee and will be based on recommendations included in the NG9-1-1 feasibility study and the Text to 9-1-1 white paper. NG9-1-1 will require a multi-year legislative agenda, with the initial focus on governance for the 2015 session. It is not expected that the Text to 9-1-1 Subcommittee's white paper will include legislative changes, but until the Subcommittee completes its report, the need for legislative change will not be known.

The implementation of statewide wireline 9-1-1 is complete. The implementation of wireless enhanced 9-1-1 is also complete. To date, all localities have implemented wireless E-911 Phase I (call back number and cell site location) and wireless Phase II service (caller location).

The Appropriations Act for the current biennium budget continues the transfer of \$3.7 million to the Virginia State Police and the \$8M transfer from the Wireless E-911 Fund to the Compensation Board to support Sheriffs' dispatchers. These transfers may impact the Commonwealth's ability to receive federal funding in the future.

The E-911 Services Board has well positioned the Commonwealth to address new and coming challenges to the E-911 system. Despite the decrease in available funding for PSAP grants beginning in FY 2011, the PSAP Grant Program continues to provide critical 9-1-1 equipment and services to the PSAPs. The PSC Division has begun working on the next edition of the Statewide Comprehensive Plan for 9-1-1. This plan will focus on NG9-1-1 and texting to 9-1-1, but it will also present an opportunity to evaluate additional developments currently impacting 9-1-1 call taking