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EASTERN SHORE, VA



# The Eastern Shore of Virginia Radio Analysis

The Commonwealth of Virginia, Virginia Information Technologies Agency, by request of the Eastern Shore of Virginia 911 Commission<sup>1</sup>, has analyzed communications equipment and performed radio studies throughout the Eastern Shore of Virginia (ESVA) 911 service area.

## Scope

The Scope of this project sets out to capture the following:

- **Document entire ESVA911 transmitter and receiver facilities**
- **Incorporate and integrate institutional knowledge with documentation**
- **Conduct Coverage Analysis and compare with observed performance**
- **Evaluate overall ESVA radio system performance and integrity**
- **Report findings**
- **Provide additional information on FCC mandates**
- **Review inventory in light of FCC mandates**
- **Make recommendations**
- **Provide conclusion and closing remarks**

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<sup>1</sup> 9-1-1 Services For Accomack and Northampton Counties Are Governed By A 12-Member Commission Appointed By The Boards of Supervisors. The Commission Meets Monthly, Generally On The Last Thursday Of The Month.

# Eastern Shore of Virginia 9-1-1 Commission<sup>2,3</sup>

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Hollye B. Carpenter, EMT-P, Northampton County Emergency Medical Services

## **EASTERN SHORE OF VIRGINIA 9-1-1 COMMISSION STAFF**

**Jeffrey A. Flourney, Director**

**Scott R. Chandler, 9-1-1 Consultant/Communications Manager**

**Margaret M. Surran, Recording Secretary**

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<sup>2</sup> 9-1-1 Services For Accomack and Northampton Counties Are Governed By A 12-Member Commission Appointed By The Boards of Supervisors. The Commission Meets Monthly, Generally On The Last Thursday Of The Month.

<sup>3</sup> Information directly taken from <http://www.esva911.org/>

# Eastern Shore 9-1-1 Communications Overview<sup>4</sup>

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**The Eastern Shore of Virginia 9-1-1 Communications Center serves the Counties of Accomack and Northampton, excluding the Town of Chincoteague (which has its own 9-1-1 Center). All 9-1-1 calls are received by the ESVA911 Communications Center. Police calls are transferred to local Sheriff's Offices or the Virginia State Police for handling and dispatching. Fire and emergency medical services calls are handled and dispatched directly to fire and EMS agencies by the staff of the Eastern Shore of Virginia 9-1-1 Communications Center.**

**In addition to receiving wireline 9-1-1 calls, the Eastern Shore 9-1-1 Center also serves as an answering point for cellular and other wireless 9-1-1 calls. The Center is capable of and committed to receiving Enhanced Wireless 9-1-1 Phase I and Phase II Calls. VoIP 9-1-1 calls are currently accepted on a designated 10-digit emergency phone number; however, all VoIP services are encouraged to seek delivery of 9-1-1 calls via our 9-1-1 tandems used for traditional 9-1-1 calls.**

**The Eastern Shore 9-1-1 Center uses Plant Equipment's VESTA ® 9-1-1 telephone equipment, supplemented by Plant's MagIC® call reporting tool. Our Computer Aided Dispatch system is provided by SunGARD/HTE (OSSI), and radio dispatching is supported by two Motorola MCC5500 communications consoles.**

**The Center also serves as an Emergency Operations Center (EOC) for any consolidated Emergency Services operations of the two counties and the Town of Chincoteague, as well as housing the Accomack County Emergency Operations Center.**

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<sup>4</sup> Information directly taken from <http://www.esva911.org/>

# RADIO SYSTEM ANALYSIS

## Prepared by the Radio Engineering Division Virginia Information Technologies Agency

### Executive Summary

This Radio Engineering report was a cooperative effort between the Counties of Accomack and Northampton (aka—ESVA) and the Virginia Information Technologies Agency (VITA)/Public Safety Communications, Radio Engineering Section. Specifically, we acknowledge Jeff Flournoy (the 911 Director), the contributions of the valuable institutional knowledge of Scott Chandler, the 911 Staff, and those individuals/volunteers that took their personal time to assist with providing data and/or verbal knowledge/input of the Eastern Shores Radio System.

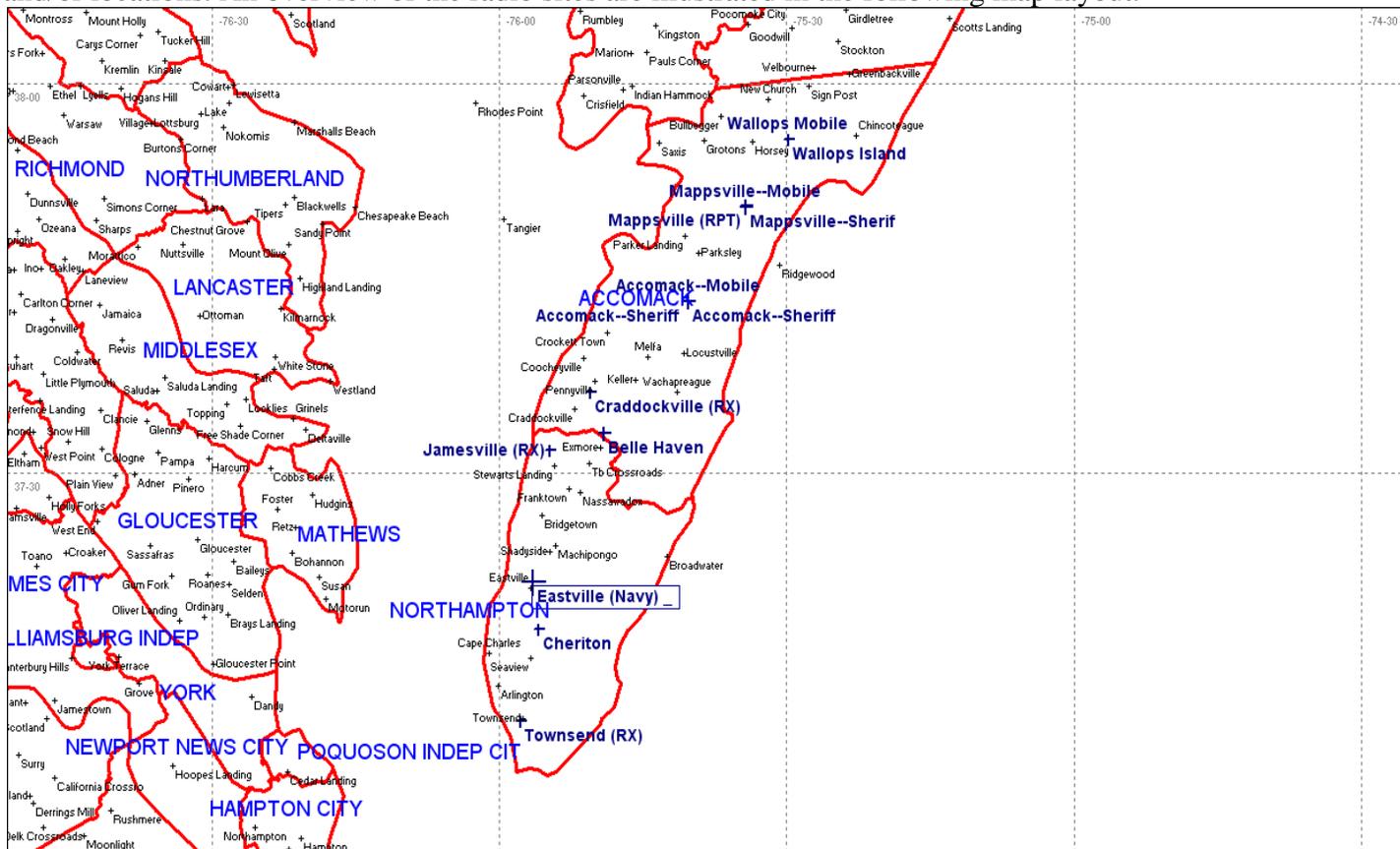
The Commonwealth of Virginia, Virginia Information Technologies Agency (VITA) was requested by the Eastern Shore 911 Commission (ESVA) operations to survey its radio operations as it relates to 911 dispatch activities of both Accomack and Northampton Counties (ESVA). With respect to this report it is recognized that *Northampton and Accomack Counties may be different by name, however by strategic mission, goals, vision, mutual operations / mutual (coordinated) discipline, and operation they are one in the same. Thus this report is focused on America's Eastern Shore—The Eastern Shore of Virginia.*

To that end, the Commonwealth agreed to perform this initial general survey. This includes reviewing the operations of the ESVA 911 Center, visiting the primary transmitters/tower locations, radio receive only stations, reported problem (coverage) areas as noted from staff and volunteers, and the review of current FCC licenses held by the entire ESVA operations. Moreover this survey also expanded and took into account the FCC Radio Narrowbanding Mandate and its implications to ESVA operations, particularly current radio equipment and how that may reflect up to a near term fiscal impact. Additionally, this report also reviewed radio operability, and radio voice interoperability—both from a Governor/statewide interoperability initiative as well as a nationwide and technical perspective.

The ESVA Radio system covers Northampton and Accomack counties. The core business model or function of the ESVA is primarily a Fire/EMS/Rescue and Dispatch Center operation. The radio system consists of a total of 11 radio sites—that is, 10 existing radio sites, which includes 3 existing receiver sites, plus one proposed receiver site at Wallops. This includes some

approximately 32 base stations and 4 consolettes<sup>5</sup>. The ESVA radio system also has 2 primary dispatch consoles and one partial backup console at the ESVA 911 Center; and approximately 287 pagers<sup>6</sup> plus approximately a total of 337 user mobile and/or portable radio units<sup>7</sup>. It should be noted that most of the user community has portable radios and are as such heavily reliant upon these resources. It should also be noted that a fair number of radios (that includes specific model portable units) and pagers will have to be replaced due to the requirements of the Federal Communications Commission (FCC) radio Narrowbanding mandate of 2013.<sup>8</sup>

The ESVA radio system operates under 3 (three) FCC licenses associated with the system—WPSJ218, WPTV453 and WQED312.<sup>9</sup> With reference to the ESVA licenses, all the licenses have undergone a review and have been updated as necessary. Most of the updates pertained to the FCC Narrowbanding mandate while other updates included the addition of frequencies and/or locations. An overview of the radio sites are illustrated in the following map layout.



The core operational composite of the radio system comprises of the radio dispatch consoles, the Spectra-Tac voting system, telephone line interconnects, the existing radio sites, and user-mobile/portable radio units, including pagers.

<sup>5</sup> Based upon asset inventory taken from each radio site

<sup>6</sup> Based upon submitted inventory numbers from participating stations. Actual numbers may be as high as 450 pagers.

<sup>7</sup> Based upon submitted inventory numbers from participating stations—most are portable units

<sup>8</sup> More info on this topic is covered in additional detail within the radio report

<sup>9</sup> This does not include police, disciplines, or other locations outside the purview of the ESVA management group

To that end, the specifics of the above are expanded upon in the following report.

The report begins by reviewing the overall geography to be covered, the density of population per square mile which will provide a good baseline from a planning perspective of what is present versus what may be a future radio system need. Additionally, the report examined who should be included within the radio system (if not already included) due to their discipline and/or proximity to your physical borders.

Within the radio report proper FCC licensing is stressed prior to ANY purchasing of any radio equipment; and the consequences of no FCC licensing, improper or expired licenses.

Basic radio concepts were introduced including the need for IP (Internet Protocols) based radio consoles which provide an avenue for quick connectivity (re-connectivity) during a forced move from the primary ESVA 911 location in Accomac in the event of an emergency. The concept of the basic radio blocks is designed to illustrate the overall harmony or integration of the ESVA radio system. Another outcome of the basic radio block is to complement the written Achilles heel synopsis with visual illustrations to the reader on the two greatest areas of potential breakdown—that area being the relationship between the radio towers and the mobile and portable units; and maintaining factory specifications for said radio equipment. The other major area of concern is the telephone lines used to pass information between the user and the 911 dispatch center.

A separate CD ROM (or chart) is being developed that illustrates current *radio operability* versus current (and potential future) *interoperability*. This Excel based chart is a good review tool as well as an ongoing exercise to assess current capability both from an operability as well as an interoperability perspective.

A radio coverage prediction model is used to provide the reader with a good visual sense of what should be expected with the current Eastern Shore radio system. This model is compared to actual reported coverage and to existing complaints. The results of the comparison are examined for congruency and incongruence. In the case of incongruence, issues and facts are outlined. It should be noted that the radio studies tend to be on the conservative side. That is, the radio coverage may actually be somewhat better than depicted.

A Radio inventory is listed with the report which gives the reader a visual perspective of how many users are associated with the ESVA system.

As the report nears end, the radio inventory is scrutinized by the FCC Narrowband Mandate. The synopsis, through the use of color coding depicts which units will or will not meet the FCC, 2013, standards. This visual tool is also used to show how many pagers will or will not meet the technical operational requirements of the FCC, 2013, mandate.

Recommendations incorporated within the report range from:

- **Practices and Procedures**

- **Alternate technology solutions**
- **Updating Policy and Procedures for specific circumstances**
- **Broaden vendor selection to meet specialized requirements**
- **Receiving Interference—considerations for resolving**
- **Current Talk-A-Round Operations and Officer Safety**
- **‘One Click Away’ within channel plan**
- **Hardening of Facilities**
- **FCC Narrowbanding and possible affect on two-way radio procurements of 2010/2011**
- **Certification of Outside Units**
- **Maintenance and upkeep of radio equipment/infrastructure**
  
- **Interoperability**
  1. **Strategic Plan**
  2. **Technical**
  3. **Operational—including P25**
  4. **Coordination, Licensing and Policy**

The report ends with ‘Synopsis and Conclusions’ which summarized and concluded on some of the keys points within this study. A final comment is made with respect to consolidation.

In closing, ESVA has been very proactive in addressing the issues within this report. Specifically, the management group became actively vigilant in pursuing problems and seeking solutions even as the issues were being uncovered.

Sincerely,

David R. Warner  
Spectrum Manager  
Virginia Information Technologies Agency/Public Safety Communications