ALTERNATIVE STAFFING PATTERNS FOR PERSONNEL

Executive Development

Alternative Staffing Patterns for ALS and BLS Personnel

NFA: EXECUTIVE DEVELOPMENT

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June 2005
CERTIFICATION STATEMENT

I hereby certify that this paper constitutes my own product, that where the language of other is set forth, quotation marks so indicate, and the appropriate credit is given where I have used the language, ideas, expression, or writings of another.

Signed: ______________________________
Abstract

The problem is the number of Advanced Life Support personnel has decreased in Accomack County. The current distribution of EMS personnel has caused significant patient care issues. The purpose of the research was to use an evaluative research method to examine different EMS staffing models in order to develop a list of recommended improvements. Research questions focused on finding EMS models at the national and state level and determining which could be applied to Accomack County. Data was collected through interviews, literature review, and questionnaires. The results revealed that no one ideal system is available, but there are a variety of effective systems. A set of recommendations were provided in an effort to improve the EMS system in Accomack County.
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Alternative Staffing Patterns for ALS and BLS Personnel

Introduction

During the past ten years trends in local government have focused on administrative systems that are more accountable, efficient and effective with resource allocations. In order to continue to meet these new standards, administrative systems have developed terms like benchmarking, metrics, quantifiable performance measures and cost benefit analysis. These terms and the ideas behind them, have forced agencies to adjust their priorities to include the continual evaluation of all programs and services. These periodic evaluations are completed to ensure that the communities being served by governmental agencies are receiving the highest quality services for their tax dollars.

Accomack County Department of Public Safety was established as a combination career/volunteer organization providing both fire and emergency medical services (EMS) to its residents. In recent years, the Department has experienced a serious problem in its ability to hire and maintain qualified advanced life support (ALS) providers resulting in significant care issues on critical calls.

The current ALS and Basic Life Support (BLS) distribution model of career providers does not allow for the full utilization of these trained personnel when and where they are most needed. The purpose of this research is to examine and evaluate alternative staffing models for EMS personnel to improve emergency medical services to the citizens of Accomack County. For this research paper, the evaluative research methodology was selected because it allows for the systematic collection and analysis of data from EMS staffing models currently in use. The outcome of the research will be the application of the data collected as a basis for
recommendations that would provide an increase in the effective and efficient use of current EMS staff.

This paper will provide research findings on the following questions:

1. What, if any, are the national models for the staffing of ALS and BLS personnel?
2. What, if any, are the state models for the staffing of ALS and BLS personnel?
3. What, if any, is the ALS or BLS guidelines being used by departments with similar demographics to Accomack County, Virginia?
4. How do the identified staffing (national/state/local) models compare to Accomack County’s current model?
5. What are the specific methods/models that could be applied to Accomack County to maximize the utilization of current ALS and BLS personnel?
Background and Significance

Accomack County is located on the southern end of the Delmarva Peninsula, a landmass beginning in Delaware and continuing southward to include a portion of Maryland and Virginia. The County is positioned between the Chesapeake Bay and the Atlantic Ocean in an area known as the Eastern Shore. Access to this area is limited. Travel to mainland Virginia is via the Chesapeake Bay Bridge Tunnel which is approximately a ninety-minute drive from the Accomack County line. As a result of the County’s remote location, the area remains largely undeveloped and economically challenged. Farming, two large poultry companies and tourism during the summer months are the main sources of income. Due to the economic challenges, County government has maintained very low tax rates. Although low taxation rates are desirable, the resulting lack of funding has restricted the Department of Public Safety’s ability to meet the County’s growing demand for EMS services and has fostered the current shortage of ALS personnel.

Accomack County Department of Public Safety (ACDPS) employs 22 career fire medics. Fire medics provide supplemental support to 9 volunteer fire stations located throughout the County. Their individual schedules vary depending upon their assigned location. Seven stations are staffed during the day-time hours (6a.m. - 6 p.m.) and 2 stations are staffed to provide twenty-four hour coverage. All personnel are trained in both firefighting techniques and EMS protocols. Staff members are assigned to each station during the day and respond with the appropriate apparatus/services required for the call. The majority of the County’s calls for service are EMS related and fill the greater part of an employee’s work day.
Accomack County does not have hospital facilities in the County. This fact extends call times considerably. At present, a typical time frame for an EMS call is approximately one hour and forty plus minutes.

Over the past several years the workforce in this country has changed. It is rare to find an employee that begins and ends his/her working career in the same job or location. Employees have become much more aware of job opportunities and are willing to travel greater distances for more lucrative salary schedules, working conditions and benefit packages.

ACDPS is well aware of these new trends in the general workforce. The Department has been adversely affected by competition from the more affluent areas of Virginia Beach, Virginia; Norfolk, Virginia; and Ocean City, Maryland. Accomack County has a lower starting salary, few advancement opportunities and a limited benefit package. Retaining qualified personnel is becoming nearly impossible. Those employees who do continue with the County often remain at the entry level BLS status.

The difference between BLS and ALS training is reflected in the services each can provide. Basic levels of service while important are limited. A BLS provider may perform such tasks as: CPR, bleeding control, splinting, administration of oxygen and transporting. Many EMS requests for assistance require a higher level of care. An ALS provider can start an IV, administer a wide-range of medications and complete some invasive procedures including tracheotomy, chest decompression and manual defibrillation. ALS providers are needed with patients who are unstable, those experiencing cardiac difficulties, major trauma injuries and medical reactions. These patients are considered critical and EMS personnel have a limited window of opportunity to stabilize them. Optimum pre-hospital care is essential and this care can only be given by an ALS provider.
At the present time, Departmental BLS and ALS staffing assignments are not based upon levels of need. Assignments are determined by the individual. He/she chooses where he/she wants to be placed or selects a station based perhaps upon proximity to their home, other friends already at the station or stations that have a vacancy. In the history of the Department of Public Safety, no effort has ever been initiated to consider other staffing arrangements or to review any current system models. The current assignment configuration is becoming more problematic each year. We have ambulances responding to numerous radio calls each day requesting ALS assistance. Many of these providers are stationed at remote locations with minimal call patterns. Valuable time is lost as these individuals drive from their assigned location to the scene of the incident.

The Department of Public Safety is clearly not meeting its obligation to provide the best possible care to the residents it is duty-bound to serve. We are not using our resources in the most efficient and effective manner possible. If this situation is not recognized and addressed soon, Accomack County could find itself in a litigious position but more importantly, it could result in the unnecessary loss of life.

The initial step to improve EMS services to Accomack County residents will be the investigation and evaluation of alternative staffing models currently in use in areas commensurate with the needs and resources of Accomack County. The first step in APIE change model as outlined in the Executive Development class for Executive Fire Officers (Federal Emergency Management Agency, 2004) is analysis of data. This analysis is the systematic collection, gathering, forecasting and assessing conditions internal and external to the organization.
This evaluative research and future implementation directly relates to the goals of the United State Fire Administration’s (2005) 2003-2008 strategic plan by “reducing loss of life and property” (p.1).

**Literature Review**

The research information presented in this paper focuses mainly on fire and emergency medical services. The National Emergency Training Center’s Learning Resource Library located in Emmitsburg, Maryland, was the literature source for use in the development of this paper. The purpose of the literature review was to develop a foundation for the applied research process contained within.

The goal was to determine if similar configurations and issues with respect to BLS and ALS staffing patterns existed in other geographical locations similar to that of Accomack County, Virginia, and to determine if solutions were ever applied to improve those issues and what, if any, were the resulting outcomes.

According to (Chiaramonte 2004, ¶ 20), “alternative delivery systems must be investigated and evaluated as to how they apply to the individual department’s current and future needs”. It is incumbent upon any department to conduct periodic evaluations in order to improve current practices and to take the steps necessary to develop more effective and efficient services. Chiaramonte (2004) also puts forth three essential ideas for consideration by any department providing EMS services. They are:

- Determine the community’s level of acceptable risk
- Determine the obligations of leadership
- Plan for the future
The most important aspect is to determine a community’s level of risk. That risk level must be communicated to local government officials in order for them to understand the types and level of EMS service being provided to its citizens. For example, “Are we providing ALS transport on every call?” What are the response benchmarks and are they being used on every call? Secondly, local government officials must be apprised periodically of the condition of the system providing the service to determine if the service dynamics are changing.

In the case of Accomack County, it is crucial that local government officials understand the risk that the continual loss of Advanced Life Support personnel presents to the community. This loss directly affects the level of care we can provide to each citizen when they activate the pre-hospital care system.

Departments providing EMS services need the funding support and encouragement of local government officials in order to plan to for the future and to develop and implement new incentives and benefit programs. New programs and benefit packages encourage ALS and BLS personnel to remain with a department and to take advantage of additional educational incentive opportunities to improve their service skills. Governmental support is the key to the implementation of (Chiaramonte’s (2004) three points.

As a result of reviewing alternative EMS service delivery models, two reoccurring themes have appeared. One was rapid access to the pre-hospital care system in any form. The second was rapid access to specially trained personnel, such as ALS providers, and subsequent procedures.

According to Chapleau, (2002), during a life-threatening emergency rapid access to either pre-hospital care or to a medical facility provided the most positive survival percentages for trauma patients. In a study conducted by UCLA Medical Center, Los Angeles, California,
trauma patients who were transported by private means were compared to those transported by EMS providers. The results showed a mortality rate twice as high for those patients transported by the EMS system. The reason for the higher survival rate with private transport was determined to be faster access to the hospital care system (Chapleau, 2002), thereby reinforcing the need for rapid response time and transport to the hospital.

In another study, researchers looked at the time it took for ALS providers to actually reach the patient after arriving on scene. The results revealed several inhibiting factors such as, locked doors, inaccurate addresses, human interference, scene security, safety issues and non-functioning elevators. In 25% of the cases studied, ALS providers were delayed more than 4.14 minutes from reaching the patient (Campbell, Gratton, Salomone & Watson, 1993). Some factors such as on-scene barriers cannot be predicted, controlled or planned for, thus further extending already long response times.

In a study conducted by Callahan & Madsen, (1996), researchers found that the survival rate among patients who received bystander CPR and/or early First-Responder defibrillation administered by fire department personnel was nine times greater than those patients who received treatment from ALS/EMS personnel but had an extended wait-time between the incident and actual hands-on care.

The second critical component to an effective EMS system is access to specialized EMS providers such as ALS personnel. A study conducted by Brown, Owen, March & Archino, (1996), examined the number of EMS providers on emergency incidents. They found that the typical staffing configuration was 2 providers. This configuration equated to 1 provider as a driver and 1 provider in the ambulance attending to the patient. Initially, both individuals worked to stabilize the patient but only one remained with the patient during transport. Brown et
al., (1996), also looked at configurations using 3 providers thus allowing 2 providers to attend to the patient during transport. The study found that although crews with 2 providers had longer on-scene times than the 3 man crew, a 2 person crew performed the same number of procedures as a 3 man crew. The additional third person permitted the other 2 providers to assist the patient during transport thus reducing the on-scene time (Brown et al., 1996).

Bissell, Eslinger & Zimmerman, (2000), while completing a literary review of EMS related publications, noted a study conducted in Monroe County, NY, that examined the success rates of ALS providers who arrived on scene after CPR had been initiated. The survival rates for patients who received ALS intervention within 10 minutes of collapse had a 13% greater survival rate than those patients who received ALS care beyond the 10 minute mark.

The studies listed above have demonstrated that early intervention, whether it is a bystander performing CPR or a BLS/ALS provider, is one of the key components to patient survival. Response times also must be considered as a vital factor when reviewing and evaluation any staffing model.

At the present time, national standards for acceptable response times have not been established. It is generally understood that EMS agencies and local governments determine acceptable response times for their communities. Ludwig, (2001) stated that the lower the response time the greater the success rate especially with cardiac patients. During a full cardiac arrest a four-minute window exists for optimum survival. After the four-minute time frame the patient begins to incur permanent brain damage. According to Ludwig, (2001), survival rates decrease from 7% to 10% with each minute that a patient is without Advanced Life Support intervention.
Through the National Fire Protection Association (NFPA) Standard 1710, an attempt has been made to establish a national consensus with regard to response-time for use by fire-related EMS agencies. NFPA has stipulated that an EMS unit should arrive on scene within the first 4 minutes of a request for service and ALS should arrive not more than 6 minutes from the placement of the call for service (NFPA, 2001). The literature indicates that other system standards vary from 8 to 12 minutes (e.g. Ludwig, 2001; Virginia Office of Emergency Medical Services, 2003).

In Accomack County, the current response standard is 12 minutes (Accomack County Department of Public Safety, 2004). The variance in response time across the County is a reflection of the staffing system model being used, methods of deployment and the unique problems that each community presents for its EMS providers. These differences are an example of what Chiaramote, (2002), refers to as a community’s level of risk.

An EMS staff is comprised of both BLS and ALS providers. In a rural setting such as Accomack County, the placement of personnel is critical. According to (Evans, 2002 ¶5), “Nearly 25% of the populace of 55 million living in this country who reside 30 miles or more miles from a medical facility receive little or no preventive medical services.” Accomack County residents fit this profile with travel times to a medical facility in excess of 30 minutes. Rural systems can be defined as those areas in which the population is less than 50,000 in a geographic area not considered a city (Mears & Cummings, 2002).

In a recent article examining ALS response times in rural areas, a group of 248 trauma cases were reviewed. It was found that 83% of the ALS paramedic’s time was spent with the patient administering pre-hospital care. It was also determined that 85% of that time the ALS care provided was beneficial to the patient. (Even, 2002).
Not all calls received require ALS services. Some systems are maximizing ALS by assessing each call using rapid BLS response team to determine if there is a need for an ALS provider. This model is called a Tiered System.

A Tiered System provides BLS services to the patient either by fire personnel First-Responders (non-transport) or by a BLS transport ambulance crew. The crew determines the level of care that is needed for the patient. If the patient is stable and within the BLS providers scope of practice, then no additional assistance is needed. If the patient presents as unstable or has the potential to become unstable, ALS providers can be called to assist. Most ALS response systems will utilize one of three possible formats: 1. A fully staffed ALS transport EMS unit providing care to the patient; 2. A BLS unit providing first-response care and then transferring the patient to an arriving ALS unit, if needed; and 3. ALS providers traveling with ALS equipment to meet the BLS ambulance en-route. The ALS providers and the necessary equipment are placed on board the BLS unit and the unit proceeds to the medical facility as ALS staff provide the required care en-route (Anderson & Jacobsen, 1992).

In rural settings the Tiered System makes the most efficient use of limited ALS personnel. The most efficient and effective use of ALS provider skills is to have that staff member in a position of rapid access. This is especially true when dealing with excessively long transport times. This system also helps to reduce a communities’ risk factor.

Rural systems also contend other concerns. They find it difficult to compete with urban systems when it comes time to hire additional EMS personnel. Regulation changes and more stringent training requirements add to the issues that rural systems must face. Educational facilities and opportunities for advanced training are difficult, if not impossible, to find in rural
areas. This position is supported by (Mears & Cummings, 2002). The Tired System ultimately appears to be the most beneficial EMS delivery model for consideration in rural setting.

Just how many EMS delivery systems are currently in use? According to Ludwig (2001), over 80 different system configurations were discovered. Some of the most common models in use today are: staffing EMS units with 2 personnel with either 2 BLS staff members or 1 BLS and 1 ALS staff member; staffing EMS units with BLS staff and having an ALS staff member available in an intercept vehicle; and using fire department personnel or using law enforcement personnel as First-Responders to provide basic care until the EMS unit arrives on scene.

The literature revealed some rather unique system adaptations. In Honolulu, a single paramedic rides three-wheeled vehicle (Cushman Type) providing both mobility and the ability to carry all of the necessary equipment that would be needed at an accident scene. This type of a system is employed during major events and/or in areas with dense pedestrian traffic (Lanzlotti, 2001). According to Lanzlotti, (2001), this service delivery system is more efficient and effective than using a conventional ambulance in areas of high pedestrian and/or vehicular traffic. Lanzlotti, (2001), also found that paramedics use bicycles much like law enforcement personnel in very remote areas.

Through an interview with David Shrader, (2005), owner of The Polaris Group, an EMS consulting agency, he gave an example of an EMS model being used in Argentina, South America. In this model, Shrader reported that each EMS unit was staffed by a Board Certified Emergency Medical Doctor, a Registered Nurse and a paramedic. All calls for service came into a hospital and each call was responded to by a physician. The physician taking the call would assess what treatment was needed, if he might provide treatment over the phone and if there was a need for an ambulance. Approximately 60% of the calls received did not require an ambulance
but treatment provided by phone was sufficient. In the remaining 40% of EMS calls requiring ambulance services, an EMS unit was on scene within 6 minutes 90% of the time. The data received reported that 94% of the patients who received an ambulance were treated on scene or advised that emergency transportation was not needed and a normal transport to the emergency facility was used. Only 6% of patients calling for EMS services were actually transported by an emergency unit. This system is unique to most of the systems in use in this country today. It places physicians in the pre-hospital setting and readily available to assess and determine the most appropriate care. This system is a consideration when looking at the pre-hospital care issues facing many departments in this County (Shrader, 2005).

**Procedures**

Literature examination, Questionnaire and Interview were the methods employed in the collection of data for this paper.

**Question 1: What, if any, are the national models for the staffing of ALS and BLS Personnel?**

A literary search of the National Fire Academy Learning Resource Center Library was conducted to locate information pertaining to EMS staffing models currently in use in the United States and abroad. The search criterion included: emergency medical care, response times, needs assessment models, ambulance service information, resource allocation, staffing patterns for ALS and BLS staff, trauma services, paramedic use, and deployment.

In an effort to examine other national models, a request for information was made via Training Resource and Data Exchange Program (TRADE). The TRADE Program was established to encourage the exchange of fire-related training information between federal, state
and local levels of government. Information was requested through the TRADENET, an e-mail list server. TRADENET is sponsored by the USFA National Fire Academy. The TRADENET program has a distribution of approximately 12,340 organizations. The following request appeared in the TRADENET newsletter published during the week of March 21, 2005:

I am looking for examples of EMS delivery systems. Specifically, ALS and BLS staffing models for emergency response used in career and/or combination departments. This information will be used in the development of an EFO research paper.

A total of 2 responses were received. A follow-up telephone interview was requested by 1 respondent, Mr. David Shrader, and it was completed on April 19, 2005. The questions listed on Appendix B were used to complete the interview.

The final data collection method used was the questionnaire. A questionnaire entitled EFO-Research was distributed via e-mail to the chief officers in the 2004 National Fire Academy Executive Officer Program. This group was chosen because of the diversity they have as individuals and the fact that they represent a cross-section of Fire/EMS leadership from a number of communities across the country. A total of 24 questionnaires were sent out and 8 were returned.

**Question 2: What, if any, are the state models for the staffing of ALS and BLS Personnel?**

The State of Virginia has established guidelines for use with all Emergency Medical Services throughout the State. The guidelines were examined using the search criterion listed in question one. A telephone interview was conducted with Ms. Melissa Doak, a Field Supervisor with the Virginia Department of Health Office of EMS. She was selected because of her expertise in the field of EMS serving as a compliance Officer for the Tidewater Region of Virginia. Ms. Doak is aware of and has worked extensively with EMS staffing and delivery
Alternative Staffing Patterns

systems currently being used throughout the State of Virginia. The interview was completed on May 5, 2005, and a list of the questions used during the interview is included in Appendix (B).

A questionnaire was sent to all 148 members of the Virginia Association of Emergency Medical Service Administrators (VAGEMSA). The questionnaire entitled “EFO-Research, developed for use in the investigation of State ALS and BLS staffing models.” was given to the members of VAGEMSA. The questionnaire was transmitted to each member by e-mail. A total of five questionnaires were completed and returned. This group was selected because they represent a cross-section of EMS service providers covering the State of Virginia. The purpose of this questionnaire focused on locating and evaluating the effectiveness and efficiency of EMS staffing models that are currently in use in Virginia.

**Question 3: What, if any, are the ALS and/or BLS guidelines being used by Departments with demographics similar to those of Accomack County, Virginia?**

The data collected from questions 1 & 2 was compared to the following demographic criteria: populations of 20,000 to 50,000; geographic areas of 300 to 400 square miles; number of staffed units between 1 and 10; and distance to nearest hospital facility between 30 to 45 miles. Only data from departments that met the criterion outlined above was tabulated. The purpose of the use of demographic information was to narrow the field of possible models and select only those that came closest to duplicating the characteristics presented by Accomack County.

**Definition of Terms**

Advanced Life support (ALS) – term used to describe a level of provider and/or level of care that can be provided to a patient beyond that of basic life support. It involves medical oversight, deliverance of legally controlled drugs/medications and procedures deemed to be invasive.

Basic Life support (BLS) – term used to describe a level of provider and/or level of care that can be delivered. Basic splinting, bleeding control and cardio-pulmonary resuscitation are among the skills. Limited medical oversight is required.
Emergency Medical Service (EMS) System/Model – Arrangement of ALS and BLS personnel, facilities and equipment coordinated to delivery patient care to a geographic area.

EMS Protocols - A written set of pre-defined skills and or procedures written under the authorization of a Medical Director which allows EMS personnel to practice medicine in the pre-hospital care setting.

Response time - The time beginning when the 911 call is first received to the time personnel arrive on scene and start administering services to the patient.

Tiered Response System – Coordinated multi-level response to emergency medical calls progressing from First-Responder support to advanced life support.

First-Responder – Personnel assigned to a fire company or division that responds to EMS related calls to assist EMS transport personnel. Usually have medical skill level below that of a BLS EMT.

Dual Role – Those personnel who perform EMS transport duties, as well as, firefighter duties on an as-needed basis, driven by the first-call need.

Fire Division – Those departments that have personnel solely dedicated to fire suppression

EMS Division – Those departments that have personnel solely dedicated to the performance of Emergency Medical Services delivery.

Results Section

Question 1: What, if any, are the national models for the staffing of ALS and BLS? Personnel?

Research into the availability of any national models or information regarding national models was very limited. A central national EMS service delivery system model could not be found. The closest national model was a national consensus standard published by the National Fire Protection Association (NFPA). NFPA standards are developed around a fire department model rather than an EMS model. It did contain some useable EMS delivery system data that should be considered. NFPA 1710 - Standard for the Organization and Deployment of Fire
Suppression Operations, Emergency Medical Operations and Special Operations to the Public by Career Fire Departments, provided some guidance. It stipulated that a First-Responder unit should be on scene able to deliver care within 4 minutes of the initial call and an ALS unit should arrive within 8 minutes of the initial call. While the NFPA standard did not stipulate manpower levels for EMS transport units, it did however, have in its appendix a recommendation from the American Heart Association (AHA) for staffing on cardiac related calls. According to the American Heart Association, its recommendation is for at least 2 BLS and 2 ALS providers for each cardiac care incident (Kern, Halperin & Field, 2001).

Due to the limited amount of information found in the literature addressing national EMS service delivery models, a questionnaire was distributed to departments across the nation to determine if any additional pertinent data could be obtained. The procedures section of this paper covers in more detail the various departments that were selected.
Table 1

*Comparison of EMS models from the Executive Development Participants*

<table>
<thead>
<tr>
<th>Department Name</th>
<th>Does your agency provide ALS and BLS transport?</th>
<th>Are all units staffed with the same level provider?</th>
<th>Description of system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anne Arundel County, MD</td>
<td>Yes</td>
<td>No</td>
<td>ALS &amp; BLS w/ALS intercept</td>
</tr>
<tr>
<td>Kent F.D., Washington</td>
<td>No: BLS F-R</td>
<td>Yes</td>
<td>First Responder Only</td>
</tr>
<tr>
<td>Winchester, Kentucky</td>
<td>Yes</td>
<td>Yes</td>
<td>BLS Engines ALS Transport</td>
</tr>
<tr>
<td>Morgag-Oriwda, California</td>
<td>Yes ALS only</td>
<td>Yes</td>
<td>ALS Engines ALS Transport</td>
</tr>
<tr>
<td>Elizabethtown, North Carolina</td>
<td>No: BLS F-R</td>
<td>No</td>
<td>First Responder Only</td>
</tr>
<tr>
<td>Mesquite, Texas</td>
<td>Yes</td>
<td>Yes</td>
<td>ALS Engine ALS Transport</td>
</tr>
<tr>
<td>Hanover Park, Illinois</td>
<td>Yes</td>
<td>Yes</td>
<td>ALS Engine ALS Transport</td>
</tr>
<tr>
<td>Hilton Head Island, South Carolina</td>
<td>Yes</td>
<td>No</td>
<td>ALS Transport</td>
</tr>
</tbody>
</table>

The table above illustrates the information that was provided by the various departments who responded to the questionnaire. A more detailed explanation may be found in Appendix A.

Many of the departments who responded require all personnel to have Paramedic certification. Thus, all unit personnel whether a first response engine, a transport unit or an intercept vehicle, were all at the same skill level.

The largest department responding to the questionnaire was Anne Arundel County, Maryland. Their delivery system was so large that they had begun to split ALS and BLS personnel to increase coverage within the County. The County’s EMS service was also expanded,
purchasing additional EMS units and hiring additional personnel. The new providers coming in were at the BLS level. This was seen as a cost saving measure for the County.

Two of the other departments that responded were Elizabethtown, North Carolina and Kent, Washington. Both departments indicated that they had just started responding to EMS calls due to public demand for shorter response times by transport units.

Information provided from a TRADE information request and subsequent follow-up with David Shrader, provided an example of an EMS model used by the EMS Bureau of Matanuska-Susitna (MatSu), Alaska. MatSu is in a very rural; if not wilderness setting with extremely harsh weather conditions most of the year and limited ALS personnel. In this county-wide system, all EMS transport units were BLS staffed. Paramedic Intercept was provided by 3 career or paid personnel available 24 hours per day. These providers worked an 8 hour shift during the day (times of highest call volume) and were on-call at night when there was a significant decrease in calls for service. The ALS providers responded using a 4-wheel drive vehicle and would meet the ambulance unit en-route to the hospital. Given the limited ALS resources, low call volume and the long transport times, this system proved to be effective (Shrader, 2005).

**Question 2: What, if any, are the state models for the staffing of ALS and BLS personnel?**

A review of the Rules and Regulations governing EMS and System Delivery for the State of Virginia revealed minimal information. Regulation 12 Vas 5-31-1230 – 1250, defined certification levels needed for BLS and ALS personnel in order to respond and treat patients requiring EMS services. The regulation also addressed the use an ALS or BLS non-transport vehicle in systems with Tiered or advanced levels of ALS Intercept (Virginia Office of Emergency Medical Services, 2003).
An interview with Ms. Melissa Doak, Program Supervisor with the State Department of EMS, affirmed that “the State does not currently have an EMS system model available.” What the State of Virginia does provide, however, is Provision of Response. Ms. Doak also acknowledged that the State of Virginia has a general statute in place that requires EMS agencies to respond with a unit, 24 hours per day to any call for help. The statute does not however, stipulate length of response time nor specifically state the level of certification for BLS or ALS providers. It only indicates that 1 EMT must be present.

When Ms. Doak was questioned about EMS systems for rural areas around the State, she indicated that a Tiered response with ALS personnel was the best approach. In most rural systems the majority of providers are at the BLS level and therefore they are the greatest single resource available to the EMS system. The focus of all BLS responders should be the immediate initiation of pre-hospital care. ALS responders would only respond after a need for more advanced care was determined. These ALS responders should carry all the ALS equipment needed. By having just ALS staff respond to calls in which advanced skills and equipment is needed, limited ALS personnel is utilized to the greatest extent. In addition, not equipping all of the transport units with ALS equipment would be a tremendous cost saving measure. The money saved could be used to enhance training opportunities and certification advancement.

The Tiered System can be used to maximize personnel services as well. The first tier would be a BLS transport unit for immediate dispatch and care. This would be followed by the second tier, an ALS Intercept or response vehicle with all of the necessary ALS equipment and appropriately trained personnel capable of providing more complex procedures.

Ms. Doak indicated that 60-70% of the EMS calls reported State-wide required BLS level services. She felt that the number reported was low due to many agencies, in metro areas,
dealing with high call-volumes, by dispatching ALS transport units that are able to begin more advanced procedures could begin before or during transport. An example would be a patient with a 5% burn to the lower leg. This is a situation that could be handled by BLS responder/transport since it would require perhaps oxygen and covering the affected area. If a paramedic was available, other advanced procedures such as IV’s could be initiated during transport. Often the hospital will request advanced procedures be completed prior to arrival if paramedic services are available. This improves patient recovery time and reduces the amount of time a patient has to be in the ER (Doak, 2005).

Several other systems employed by departments throughout the State use fire department personnel as First-Responders. These departments have received training in the use of Automatic External Defibrillation (AED) devices to increase cardiac survival rates (Doak, 2005).

A number of EMS agencies from around the State responded back via the questionnaire that was sent to the Virginia Association of Emergency Medical Service Administrators. Below is a detailed listing.

Table 2

*Comparison of EMS Models from the Commonwealth of Virginia*

<table>
<thead>
<tr>
<th>Department Name</th>
<th>Does your Agency provide ALS and BLS Transport?</th>
<th>Are all units staffed with the Same Level Provider?</th>
<th>Description of System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wintergreen Fire/EMS</td>
<td>Yes</td>
<td>No</td>
<td>ALS transport &amp; Intercept</td>
</tr>
<tr>
<td>Richmond Ambulance Authority</td>
<td>No: ALS only</td>
<td>Yes</td>
<td>ALS transport only</td>
</tr>
<tr>
<td>Fairfax County</td>
<td>Yes</td>
<td>No</td>
<td>ALS Engines ALS/BLS transport</td>
</tr>
<tr>
<td>Spotsylvania Fire/Rescue</td>
<td>Yes</td>
<td>No</td>
<td>ALS Engines ALS/BLS transport</td>
</tr>
</tbody>
</table>
Question 3: What, if any, are the ALS and BLS Staffing models being used by departments with similar demographics to Accomack County, Virginia?

Accomack County is located on a projection of land that takes in three states: Delaware, Maryland and Virginia. Accomack County occupies approximately 602 square miles of land at the lower end of the Delmarva Peninsula known as the Eastern Shore. It is bordered by the Atlantic Ocean on the east and the Chesapeake Bay on the west. The topography is flat, coastal plain with tidal wetlands, undeveloped wooded areas, field crops and coastal lagoons. The climate is moderate with temperatures ranging from the 30’s to 80’s. The area is subject to hurricanes and tornadoes during the summer and rain, ice and some snow during the winter months.

In selecting departments to review, the following ranges of demographics were used:

Table 3

Demographic parameters used in filter respondent data

<table>
<thead>
<tr>
<th>Population Range</th>
<th>Area Covered</th>
<th>Agency Organization</th>
<th>Number of Staffed Station</th>
<th>Distance to Hospital</th>
<th>Yearly EMS Call-Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>12,000-50,000</td>
<td>200-400</td>
<td>Career or Combination</td>
<td>1-10</td>
<td>15-45+</td>
<td>1,000-7,000</td>
</tr>
</tbody>
</table>
POPULATION - Accomack County has a population of approximately 38,000 residents. A range of 12,000 to 50,000 was selected because of the fluctuation in population numbers the County experiences during the summer tourist season. Limiting responses to the 20,000-50,000 range would have excluded smaller rural areas that may have emerging systems due to growing population numbers.

AREA – Accomack County covers approximately 602 square miles of land and water. Only 2% of the County is considered developed and the remaining 98% remains virgin woodlands, farmlands and wetlands (Accomack-Northampton Planning District Commission (1989). Thus, departments serving small geographic areas would still provide a valid comparison.

AGENCY ORGANIZATION - Accomack County Department of Public Safety’s staffing model uses a combination system for operations and a separate system for administration of the program.

NUMBER OF STAFFED STATIONS - Accomack County Department of Public Safety has 9 stations with 2 career personnel assigned to each station.

DISTANCE TO HOSPITAL - At the current time, travel to a medical facility can vary from 15-45 miles.

YEARLY EMS CALL VOLUME - At the current time, Accomack County responds to approximately 2,400 calls per year.

The following 5 departments were selected based upon similar characteristics to Accomack County, Virginia.

Table 4

Comparison of Similar Respondents to Accomack County

<table>
<thead>
<tr>
<th>Agency</th>
<th>Population</th>
<th>Area Covered</th>
<th>Agency Organization</th>
<th>Number of Staffed Station</th>
<th>Distance to Hospital</th>
<th>Yearly EMS Call Volume</th>
</tr>
</thead>
</table>
The following departments were found to have similar demographics to those in Accomack County.

**Orange County, Virginia.** – Currently, the County has 3 or 4 ALS-staffed units during the day depending upon available career and part-time staff. These units are supported by a volunteer EMT or an additional career medic. They also use an ALS Intercept vehicle with a responding supervisor who is able to provide additional ALS support. They use 3 of their 5 volunteer fire departments to provide first-responder service as well.

**Franklin County, Virginia** - The County has 3 ALS-staffed ambulances available from 6 a.m - 6 p.m. Personnel have also been trained as firefighters and are expected to respond to fire calls as needed. They use 2 of their 10 stations to provide First-Responder support on EMS calls.

**Louisa County, Virginia** - The County has 2 or 3 ALS-staffed ambulances available during the day. They do not staff any BLS units during the day. They augment services with fire response on select First-Responder calls.

**Prince George County, Virginia** - The County attempts to provide 2 ALS-staffed transport units daily although availability is dependent upon volunteer staffing. A single ALS unit with career personnel responds from a central location during the day. At the present time, 3 of the 5 volunteer fire companies are considering beginning First Responder programs. In the near
future, the County hopes to improve their system by having 2 additional ALS transport units and receive first-responder’s assistance from the volunteer fire companies.

**Northampton County, Virginia** - The County provides 2 ALS-staffed units during daytime hours (6 a.m. – 6 p.m.). Their system is maintained by volunteer response agencies during the night, (6 p.m. - 6 a.m.) with an ALS staffed zone-car available to provide assistance to the volunteers.

**Borough of MatSU, Alaska** – Although much of the demographic information was unreported by Shrader (2005), but given the population and area covered, it should be considered rural. MatSu provides career personnel to assist volunteer BLS units through an ALS Intercept method.

The following departments were excluded because population totals were not in the range identified: Mesquite, Texas Fire Department, Wintergreen, Virginia Fire/Rescue, Kent, Washington Fire Department, Richmond, Virginia Ambulance Authority, Fairfax County, Virginia Fire/Rescue Department, Anne Arundel County, Maryland Fire/Rescue Department, Elizabethtown, North Carolina Fire Department, Moraga-Oriwda, California Fire District, Winchester, Kentucky Fire/EMS Department, and Spotsylvania County, Virginia Fire/Rescue Department. Hanover Park, Illinois Fire/Rescue Department was also excluded based upon the area covered.

The use of demographic information as a comparative guide provided insight into possible improvements that the County could consider and a different way of looking at the department as a whole.

**Question 4:** How do the identified staffing models (national/state/local) compare to the current model used by Accomack County?
Accomack County is a fully career department that provides supplemental Fire and EMS staffing to 9 separate volunteer Fire/Rescue stations within the County. The Department is funded through a combination of a special tax levy and general fund monies from the County. It is common in smaller communities such as Accomack County to have career providers functioning on the first-come first-serve capacity with regard to fire or EMS calls. Many departments list Fire and EMS in their name, but during any one given day or work period they have specific personnel assigned to either fire or EMS. Our personnel are trained in both aspects and respond to either type of call on a daily basis. The table below listing of the respondents and the type of service provided.

### Table 5

**Comparison of the Respondents with Regard to Service Type Provided**

<table>
<thead>
<tr>
<th>Agency</th>
<th>Dual Role Fire/EMS</th>
<th>EMS Only</th>
<th>Fire Only or First Responder</th>
<th>Fire Division EMS Division</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accomack County</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anne Arundel County, Maryland</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kent F.D., Washington</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Winchester, Kentucky</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Morgag-Oriwda, California</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Elizabethtown, North Carolina</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Mesquite, Texas</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Hanover Park, Illinois</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Hilton Head Island, South Carolina</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Wintergreen Fire/EMS, Virginia</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Richmond Ambulance Authority, Virginia</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
The Virginia Counties of Franklin, Orange, Spotsylvania and the Departments of Hilton Head, South Carolina, and Wintergreen, Virginia, provide services similar to the services offered by Accomack County career fire-medics.

**Spotsylvania County, Virginia** - Provides both fire and EMS services through a supplemental staffing program. Their coverage times are also from 6 a.m. – 6 p.m. with volunteers maintaining the system at night again, similar to Accomack County. They staff 9 ALS ambulances of which 5 are dual-role, fire or EMS call-dependent. Station staffing is also similar to Accomack with only 2 personnel per station.

**Wintergreen, Virginia** – Is a private resort community-based department with 24-hour dual role staff. They provide 2 personnel per station (two stations) per day. They are supplemented by volunteer assistance for working fires.

**Hilton Head Island, South Carolina** – The staffing model currently being used consists of a 4 person company for either a fire call or an EMS call. This location provided the most complete data in this study. Their fire-based EMS response was quite similar to that of Accomack County.
Franklin County and Orange County, Virginia - Have been previously explained in research question #2.

**Limitations**

One of the most significant limiting factors in both the literature and questionnaire responses was the definition of ALS and BLS personnel as it related to actual skill level and/or procedure. Most states set the ALS/BLS criteria. Through the data collection process, it became apparent that each state appears to have unique definitions for ALS and BLS skills which make any direct comparison between states flawed.

Another limitation that was encountered was the limited number of responses to the questionnaire. According Krejcie and Morgan, (1970), sampling sizes should have been much higher than those received in this research attempt. In order to have a valid representative sample to evaluate, a larger number of both state and national questionnaires would be needed as referenced in the text.

Table 6

*Comparison of Responses to Krejcie & Morgan’s (1970) Recommended Sample Size*

<table>
<thead>
<tr>
<th>Sample Group</th>
<th>Total Population</th>
<th>Responses Received</th>
<th>Suggested Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Development participants</td>
<td>24</td>
<td>11</td>
<td>19</td>
</tr>
<tr>
<td>VAGEMSA</td>
<td>148</td>
<td>10</td>
<td>103</td>
</tr>
</tbody>
</table>
Discussion

Given the wide-scope of data that was received and the many variations in delivery systems being used, it is easy to see why a national EMS staffing model has not been established. It is also equally as difficult to attempt to find and apply a single model that meets completely the specific criteria for Accomack County. Some communities had factors that were common to all and some that were unique to a single community. The array of variables produced a variety of approaches to EMS staffing.

Although there were many different models presented, the data divided into three distinct headings; those providing First-Responder service, those that providing ALS or BLS transport and those providing ALS Intercept to either ALS or BLS units. These headings could be further broken down into a Tiered System as mentioned by Anderson & Jacobsen, (1990), and those providing only one service level either ALS or BLS transport only.

The data that was collected provided a great deal of incite into EMS staffing systems and the factors that helped to shape the systems currently in use. Many of the departments that did respond were similar in structure to that of Accomack County. They too had personnel who performed dual roles as firefighter and/or EMS based upon the nature of the first call.

Hilton Head, South Carolina, and Orange County, Virginia, were two departments that were most similar to Accomack County in that respect. The idea of dual-role or first-come first-serve type for Fire/EMS response is typical in combination systems where manpower is at a premium. The use of this configuration at Hilton Head Island, South Carolina, surprised this researcher when you consider the impact that comes with the tremendous influx of tourists during the summer season and the restrictions that an island location presents. Another factor
that was a common thread in the data was the fact that level of staffing was dependent upon funding availability.

Most respondents felt that the system currently in use in their community was, at the very least, adequate for the area and the type of service they were providing. It was clear from the information gathered that time required to get to the patient was one of the most valuable criterion for measuring the success of the staff arrangement. It was most apparent with respondents having response-time standards within the 8-12 minute time-frame. This fact is supported by data from both the NFPA and the study conducted by Brown et al., (1990).

It was also clear that all EMS transport units whether BLS or ALS, were staffed with only two 2 personnel, with one exception that being Hilton Head Island, South Carolina. This configuration is consistent with current practice in Accomack County. The data also revealed that some respondents (Anne Arundel, Maryland and Fairfax, Virginia) were moving from 2 ALS personnel per unit to 1 ALS and 1 BLS personnel per unit in an effort to spread out their resources without having to hire additional ALS personnel.

The final research question: What are the specific methods/models that could be applied to Accomack County to maximize the utilization of currently ALS and BLS personnel?

In evaluating the different systems for applicable use in Accomack County it was apparent that not a single system stood out as a perfect match. The concept of a Tiered-response appears to be a successful model for rural settings as evidenced in Northampton, Orange and Rockingham Counties where the availability of ALS personnel is limited. This system allows a BLS-staffed transport unit to be either the initial response on scene or to meet fire department First-Responders on scene. The BLS crew can evaluate and determine if ALS intervention is
needed. If the patient’s injuries require ALS services, an ALS intercept vehicle would be called to the scene or meet the transporting unit en-route to the medical facility. This concept would be beneficial for Accomack County since ALS personnel are limited and would be used only when the patient’s condition warranted advanced medical services. Much of Accomack County is still rural and on average, transport from scene to a medical facility takes approximately 45 minutes or more. It is counter productive to have an ALS provider accompanying a patient who does not require ALS services and leave the community with inadequate coverage until the ALS provider returns to his/her station.

In addition, the use of 24-hour scheduling for all ALS personnel would give the community a greater degree of specialized emergency care and assist the volunteer departments during the night-time hours.
Recommendations

After careful examination and evaluation of the data submitted, the Tiered EMS System model appears to be the most advantageous approach for Accomack County to consider at this time. The Tiered model provides a consistent level of care twenty-four hours a day, it has demonstrated a reduction in response time/transport times and it is cost effective.

The data received substantiated the benefits of this system especially in a rural setting such as Accomack County. Based upon the information provided in data collection, the following changes are recommended for Accomack County:

Fire Department First-Responder

Investigate the training and cost factors to prepare the volunteer departments to respond to priority one EMS calls and to provide appropriate assistance to EMS personnel.

Accomack County Career Staff

Examine the feasibility of a Tiered approach for EMS response.

- Utilize our limited ALS personnel in a more efficient manner.
- Conduct a cost benefit analysis to determine what, if any, cost savings could be realized, by reconfiguring ambulances to BLS level and refitting a series of intercept vehicles to ALS level with the salvaged equipment.
- Conduct personnel interviews with both the career providers and the volunteer department’s administrative staff to determine the level of interest and commitment in transitioning to a Tiered system approach for Departmental EMS service.
Establish Response Benchmarks

The research has shown that response time is one of the most critical indicators for survival. Establishing time intervals provides the Department with quantifiable data to use in determining the Department’s efficiency and effectiveness.

It is anticipated that the changes proposed will provide many benefits to the Accomack County Department of Public Safety and the community being served. The changes offer the Department a means to reduce response times and improve survival rates. They allow for the full use of ALS/BLS personnel at their respective levels of certification. They provide for the more efficient use of financial resources by hiring new applicants with BLS certification and providing the opportunity for these new employees to seek more advanced training during their employment. The outcome of all of the proposed changes will ultimately benefit the individual patient being treated and the community as a whole.

In order to implement these new changes the cooperation of both career personnel and the volunteer departments is needed. A step approach would provide time for everyone involved to fully understand the changes, commit to making these changes work and to be a part of the improvement of services to their community.

These changes will require that additional research be completed into the most appropriate placement of current personnel, the cost factors involved and the establishment of a time-line for implementation. The most expeditious way to complete the tasks listed above would be the use of an independent consultant. Change in employment routines is often very stressful and the use of an independent voice would help to remove the implication of favoritism or punishment. It is imperative that the delicate working relationship between the career staff, volunteer departments and local government be maintained and supported.
For anyone considering duplication of this study for use with their own departments, the following should be taken into account:

- Defining the duties and procedures that ALS and BLS certified personnel are to perform before beginning the study.
- Thoroughly investigate your own state before expanding to include other states.
- Look for quantifiable ways to evaluate your system’s efficiency and effectiveness.
- Establish a definite time-line for periodic departmental evaluations.
Reference


Doak, M. (personal communication, March 26, 2005).


Appendix A:

State/National Questionnaires
Dear EMS Administrator;

My name is Jason Loftus and I am the Director of Public Safety for Accomack County, Virginia. I am collecting data for a research paper as a requirement for the National Fire Academy Executive Officer Program. The focus of the data collection and the subsequent research centers on alternative EMS staffing models that are currently being used by other departments. The purpose of the paper is to determine if there are other staffing models that could be applied to Accomack County to improve the effectiveness and efficiency of the County’s EMS service.

I am requesting your assistance by completing the attached. Should you have any questions please feel free to contact me at the number listed below.

Your input is greatly appreciated.

Sincerely,

Jason R. Loftus

Jason R. Loftus, Director
Accomack County
Department of Public Safety
P.O. Box 102
Tasley, Va. 23441
757-789-3610 office
757-789-3629 fax
jloftus@co.accomack.va.us
<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the population covered by your department?</td>
<td>0-12,000</td>
</tr>
<tr>
<td></td>
<td>12,001-20,000</td>
</tr>
<tr>
<td></td>
<td>20,000-50,000</td>
</tr>
<tr>
<td></td>
<td>50,000-100,000</td>
</tr>
<tr>
<td></td>
<td>Over 100,000</td>
</tr>
<tr>
<td>What is the geographic area covered by your department? (in square miles)</td>
<td>0-100</td>
</tr>
<tr>
<td></td>
<td>100-200</td>
</tr>
<tr>
<td></td>
<td>200-300</td>
</tr>
<tr>
<td></td>
<td>300-400</td>
</tr>
<tr>
<td>How is your agency organized?</td>
<td>Volunteer</td>
</tr>
<tr>
<td></td>
<td>Combination</td>
</tr>
<tr>
<td></td>
<td>Career (local government)</td>
</tr>
<tr>
<td></td>
<td>Private Service</td>
</tr>
<tr>
<td></td>
<td>Other</td>
</tr>
<tr>
<td>How many stations/units are staffed?</td>
<td>1-5</td>
</tr>
<tr>
<td></td>
<td>5-10</td>
</tr>
<tr>
<td></td>
<td>15-20</td>
</tr>
<tr>
<td></td>
<td>Over 20</td>
</tr>
<tr>
<td>What is the distance to the nearest hospital?</td>
<td>1-15miles</td>
</tr>
<tr>
<td></td>
<td>15-30miles</td>
</tr>
<tr>
<td></td>
<td>30-45miles</td>
</tr>
<tr>
<td></td>
<td>Over 45miles</td>
</tr>
<tr>
<td>What is your EMS call volume per year?</td>
<td>100-1,000</td>
</tr>
<tr>
<td></td>
<td>1,000-3,000</td>
</tr>
<tr>
<td></td>
<td>3,000 – 7,000</td>
</tr>
<tr>
<td></td>
<td>7,000 – 10,000</td>
</tr>
<tr>
<td></td>
<td>Over 10,000</td>
</tr>
<tr>
<td>Does your agency have response time benchmarks?</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td>NO</td>
</tr>
<tr>
<td>If yes, please indicate what those are</td>
<td></td>
</tr>
</tbody>
</table>
Does your agency provide ALS and BLS transport?
☐ YES  ☐ NO

Are all your units staffed with the same level of provider?
☐ YES  ☐ NO
If no
why?

Can you describe your EMS staffing and delivery model?
Example: In ABC County we staff 6 BLS transport units with 2 paramedic intercept vehicles. The fire department provides first response support on only critical calls.

Do you feel the model you are using is the most effective use of your EMS resources?

Please submit form in one of the following ways:

MS Word: Click “File” on top of screen
Select “Send to”
Select “Mail recipient”
Send to jloftus@co.accomack.va.us

FAX  Print and fax to
(757)-789-3629

MAIL  Accomack County Dept. of Public Safety
PO Box 102
Tasley  VA 23441
Appendix B:

Interview Questions
What is your Role/position within the EMS Community?

What if any EMS Staffing requirements exist at the state or national level?

For rural settings, in your experience what staffing models work well?
   Can you give example of localities using those systems?

What are you opinions of Tier response systems?
   For Rural Communities
   For Urban Setting

What example of EMS Systems have you seen throughout the state, national or international that would be beneficial to Accomack County?
Please describe them.