

ALTERNATIVE DELIVERY SYSTEMS FOR THE DOÑA ANA COUNTY

VOLUNTEER FIRE DISTRICTS

EXECUTIVE LEADERSHIP

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An applied research project submitted to the National Fire Academy as part of the
Executive Fire Officer Program

June 2006

Certification Statement

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

Signed: _____

Abstract

The problem was the Doña Ana County Volunteer Fire Districts were not responding to every emergency call thus leaving a concern for a defined level of service to the county. The purpose of this Applied Research Project (ARP) was to describe the service capabilities of the Doña Ana County Volunteer Fire Districts and seek alternative service delivery systems to meet the increasing emergency call volume with volunteer personnel in Doña Ana County. This was a descriptive research project. The research questions were:

1. What are the national or industry trends used to indicate a system's change is needed for fire service organizations?
2. What are the national or industry alternative delivery systems used by other fire service organizations?
3. What are other alternative delivery systems volunteer fire service organizations using in the State of New Mexico?
4. What are the indications that Doña Ana County Volunteer Fire Districts are in need a of a system's change?

Principle procedures involved were to research published material from credible sources, analyze the capability of the county volunteer fire service, and survey the district fire chiefs on service capability and perception on system's change. Key personnel at the state and local level were interviewed to have a better understanding of the issue on the lack of volunteer personnel available for response.

The results were that based on national and organizational indications for change, the Doña Ana County Volunteer Fire Districts are in need of a system's change. There

are numerous alternative delivery systems that organizations could implement and tailor the system to meet the needs of the organization and the community.

The recommendations, based on the results, identified a need for a complete organizational analysis that includes operation, administration, finance, safety, and training. The governing documentation is significantly outdated and needs to be revised and updated. The community has grown while the fire service has not. The need for an alternative delivery system is needed and based on the results; the implementation of a combination type fire service would work best for Doña Ana County.

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Introduction

Volunteer fire service organizations are faced with significant challenges in providing a defined level of service to their community. One of those challenges is to provide fire protection to the community with limited personnel. In Penn Township Pennsylvania, a mass of fire apparatus lined up to battle a fully engulfed structure fire. However, this mass of fire apparatus lacked one resource, personnel. The blaze ultimately destroyed the residence and fire officials claim if personnel had been on scene, they would have been able to save the business (Hampson, 2005, p. A.1).

Doña Ana County is not exempt to this complex issue. Frustration can be heard in the voice of the volunteers when emergency calls are missed. The busiest fire district, Doña Ana Fire District 1, is missing 10 to 12 calls a month because personnel are not available to respond and must rely on mutual aid from neighboring fire districts (Hopkins, 2005, pp. A.1, A.9).

In November 2005, the Las Cruces Sun News reported that a county resident waited approximately 45 minutes for volunteer personnel to respond to a medical aide call. The local volunteer fire district did not respond and a neighboring district was called upon to assist in the incident. The neighboring district is a 20-minute drive away (Alba, 2005, pp. A.1, A.8).

The problem is the Doña Ana County Volunteer Fire Districts are not responding to every emergency call thus leaving a concern for a defined level of service to the county. By not analyzing the service delivery capabilities of the organization and the needs for emergency service to the county, this problem will affect the way emergency services are provided and delivered in the future. The purpose of this Applied Research

Project (ARP) is to describe the service capabilities of the Doña Ana County Volunteer Fire Districts and seek alternative service delivery systems to meet the increasing emergency call volume with volunteer personnel in Doña Ana County. This is a descriptive research project. The research questions are:

1. What are the national or industry trends used to indicate a system's change is needed for fire service organizations?
2. What are the national or industry alternative delivery systems used by other fire service organizations?
3. What are other alternative delivery systems volunteer fire service organizations using in the State of New Mexico?
4. What are the indications that Doña Ana County Volunteer Fire Districts are in need of a system's change?

Background and Significance

Doña Ana County is one of 33 counties within the State of New Mexico. It is located in south-central New Mexico and borders El Paso County, Texas, to the east and southeast. Directly south, Doña Ana County shares its borders with the state of Chihuahua, Mexico. The surrounding counties to the west, north, and east are Luna County, Sierra County, and Otero County. The county occupies approximately 3,804 square miles and according to the United States Census Bureau (2004), the estimated population in 2004 for Doña Ana County was approximately 186,095 people. Doña Ana County is ranked as one of the fastest-growing communities in the United States and is the second most populated county in the state (Doña Ana County, 2005).

The main contributing community to Doña Ana County is the City of Las Cruces. The city is the county seat and is located in the heart of the county. The city is totally independent with its own government, infrastructure, and resources. According to the United States Census Bureau (2000), the City of Las Cruces has a population of 74,267 people and is approximately 52 square miles.

Doña Ana County is a richly diverse community with vast agricultural lands and economic development. Contributing to this diversity is the New Mexico State University, White Sands Missile Range, White Sands Test Facility, and numerous historic sites. All these factors combined give Doña Ana County and the City of Las Cruces the opportunity for continuous and significant growth.

For the past two years, Doña Ana County has grown in population and in economic development. According to the Las Cruces Sun News, the county has seen a steady growth in population of approximately two percent per year. From July 2003 to July 2004, the county saw an increase of approximately 3,500 people (Haussamen, 2005, p. A.1). This growth signifies a strong local economy that will continue to grow and will impact all services and infrastructure provided by the county.

The volunteer fire districts are experiencing the affects of this growth. Some of the volunteer fire districts have a significant high call volume in which the volunteer organization has difficulty keeping up with the service demand. At times, some of these emergency calls go unanswered because volunteers are not available to respond. The majority of emergency calls occur during the daytime hours and most volunteers work during the day. When a call goes unanswered, mutual aid is activated from the closest fire district to respond and mitigate the incident. At times this too is a burden on the

mutual aid district because all districts suffer from a lack of personnel. Most of the districts struggle with the issue of recruiting personnel and have a difficult time retaining them. Most districts on an average have a roster of 20 personnel however the district may only have a few active personnel that respond to the majority of incidents within the district. This issue fluctuates by districts. The management of volunteer personnel is difficult because the organization depends on personnel that may leave the department at any time. Volunteers leave the organization for various reasons or lose interest.

The history of the fire service in Doña Ana County started with the establishment of the first volunteer fire district in the community of Doña Ana, New Mexico in 1966. The second fire district was established in the community of Anthony, New Mexico followed by the third fire district established to provide fire protection to the New Mexico State University. As the county continued to grow additional fire protection was needed and other fire districts were established throughout the county. The county is comprised of 16 volunteer fire districts and three fire sub-stations. These fire service organizations are strategically placed in the unincorporated areas of the county to deliver a quick response for the respective community. There are approximately 350 volunteer firefighters throughout the districts. The number of personnel fluctuates based on the retention and recruitment of members. The level of trained of personnel vary, however, the basic training levels are Firefighter I and II, First Responder, Hazardous Materials Awareness, and Wildland Firefighting.

The county's emergency service division is a grouping of organizations that consists of the Fire Marshal's Office (FMO), the 16 independent volunteer fire districts, and Office of Emergency Management. The FMO oversees the county and supports the

districts in their operations. The FMO is directed to establish a uniform set of rules for the districts to follow and operate. These governing rules are called the “By-Laws”. The current By-Laws were developed and implemented in 2001. A chief officer oversees the district and is responsible for daily operations. Although the By-Laws are used to keep uniformity in the operation of the districts, each district is operated independently. The operation of the district is left at the discretion of the chief officer. There is no established, consistent, or approved delivery system for response that ensures coverage of the district. Personnel are required to attend business meetings, training sessions, and respond to a percentage of calls within the district (Doña Ana County, 2001, p. 12).

The Board of County Commissioners (BOCC) in 1983 approved the first fire protection excise tax to generate revenues to purchase needed equipment, apparatus, and to maintain the fire stations. The funds cannot be used on salaries or be used to compensate the volunteers. The document outlines the structure of the Fire Tax Board (FTB) that is comprised of eight district chiefs. The FTB allows input from the volunteers on how to spend monies based on priorities for the fire districts. The county fire marshal is the chairman for the FTB and the BOCC ultimately has the final authority on all expenditures (Doña Ana County, 2000, p. 1).

The Fire Marshal’s Office (FMO) is primarily responsible for fire prevention activities, investigations, building inspections, plan reviews, and the hazardous materials response program. The FMO also supports the 16 volunteer fire districts with policy and procedure, procurement, budgeting, documentation, training, and other management activities. The FMO has a staff of four personnel and is under the direction of the county fire marshal.

The Office of Emergency Management (OEM) is the third entity in the emergency service division and it is the resource focal point for emergency management. OEM is primarily responsible for maintaining the region's emergency operation plan, maintaining the Emergency Operations Center (EOC), hazard communication, and other emergency management duties. The State of New Mexico, the City of Las Cruces, and the Doña Ana County are the financial stakeholders for the operation. OEM has a staff of four personnel and is under the direction of the county fire marshal.

Prior to 1988, there was no established delivery system, structure for the organization, or data to substantiate the amount of callouts for the volunteer fire district. At the present, the volunteer fire districts are operating under an infrastructure that allows each district to operate as an independent entity with the fire marshal establishing policy and procedure. The volunteer fire service and the FMO have not been evaluated or upgraded to ensure the entities were meeting the needs of the community. In the future, as Doña Ana County continues to grow and the need for emergency services increases, the county will ultimately have a completely paid fire service that will provide fire protection, emergency medical service, and other emergency type services 24 hours a day, seven days a week. The FMO and the volunteer fire departments play a critical role in ensuring that this risk-reduction effort takes place.

This ARP relates to the decision making skills module presented in the *Executive Leadership* course (NFA, 2005, SM 4-1). This project is a description of the service capabilities provided by the organization and will serve as a risk-reduction effort. This effort will be used to determine if the Doña Ana County Volunteer Fire Districts is in need of a systems change and to identify immediate improvements for the organization.

This research project relates to the United States Fire Administration operational objective, “To respond appropriately in a timely manner to emerging issues” (NFA, 2003, p. II-2) by identifying potential weaknesses in the service capabilities provided by the Doña Ana County Volunteer Fire Districts.

Literature Review

The purpose of this literature review is to gather and review pertinent information regarding the questions posed for this Applied Research Project. Five questions are to be addressed. First, what are the national or industry trends used to indicate a system’s change is needed for fire service organizations? Second, what are the national or industry alternative delivery systems used by other fire service organizations? Third, what are other alternative delivery systems volunteer fire service organizations using in the State of New Mexico? Finally, what are the indications that Doña Ana County Volunteer Fire Districts are in need of a system’s change?

First, what are the national or industry trends used to indicate a system’s change is needed for fire service organizations? The International Association of Fire Chiefs (IAFC) Volunteer and Combination Officers Section understands the difficult situation volunteer fire organizations face with changing methods of operation to improve the services they provide. The IAFC (2005) identified in the Red Ribbon Report specific signals for change in the operation of volunteer fire departments when the needs of the community cannot be met. The identified signals for change were a community aging, missed calls, extended response times, and reduced staffing. Based on these factors, fire service organizations need to evaluate their organization and determine if there is a need

for change. These four factors combined indicate an inconsistency in a department's ability to provide adequate services to the community (p. 3).

Edwards (2005) noted, "As fire departments move into the twenty-first century, the ability to measure performance will be critical for their success" (p. 243). Fire service leaders must analyze the services provided to the public to ensure the organization is meeting the needs of the public. If there is a concern about how services are provided from a volunteer service then an alternative delivery systems is inevitable. Marinucci (1990) identified some examples used to indicate a system's change is needed for a volunteer organization. He noted inadequate responses by volunteers, rapidly growing community, and personnel lacking the skills necessary to perform. These indicators may result in the organization migrating to a paid type of service depending on what the community's expectation of service delivery is. Some changes can be implemented without serious hardship to the organization and other changes may be drastic. These drastic changes should be implemented slowly to reduce the impact to personnel (p. 8).

The public has an expectation that when emergency services are needed the service will be delivered in a timely fashion. What if the volunteer organization could not ensure the level of public safety it expected? In Loudoun County, VA, the volunteer fire department could no longer handle the emergency call volume with a growing community and a decline in volunteer personnel. Baltic noted several factors for a system's change. First the type of call has changed from the past and personnel must be educated and trained in order to handle the situation appropriately. High training standards establish a baseline level of service for the organization. Second, increasing call

volume. Volunteer departments have difficulty responding to every incident. Personnel are working, going to school, or doing activities that are brought about in daily living, and therefore cannot find the time to respond (1992, p. 60).

A scientific approach can also be used to indicate if a system's change is needed. A computer-generated model was developed evaluating 12 specific variables to indicate if a transition from a volunteer fire department to a combination or fully paid department is needed. The number one factor on the list of variables was the number of annual calls to the department. In the initial testing of the model, it was accurate 87% of the time. This is a significant percentage in considering a confidence level in a model that will produce an outcome based on a statistical analysis rather than opinion and hearsay (Broviak, 1996, p. 50).

Second, what are the national or industry alternative delivery systems used by volunteer or combination fire service organizations? In an effort to ensure that a community has personnel available during the day or during peak hours to respond is to compensate the volunteer firefighter. In Williamstown, Massachusetts, volunteer firefighters are on a pay-per-call system. This type of system was established due to volunteer personnel working during the day and the community needing coverage. This system has been in place for almost 80 years and personnel are paid \$10.00 per call. Personnel are paid for their services twice a year, in June and in December. This type of system may seem attractive to people because of the financial compensation, however the organization does not use compensation as a recruitment tool or incentive to get people to volunteer. During the recruitment process, department personnel explain to the potential

volunteer that the mission of the organization is to serve the community and the compensation is not intended as a financial opportunity (Thompson, 2005, p. 12).

An alternative system that is gaining momentum is the establishment of a combination type fire department. This type of system has paid personnel augmented by volunteers. The concept behind this type of system is to have a crew respond with apparatus and equipment from the fire station to the incident and have volunteer personnel respond directly to the incident to support the operation. The city of Loveland, Colorado, employs 58 career personnel augmented by a maximum of 80 volunteer personnel. The organization is divided into three divisions of suppression, prevention, and emergency management planning and provides an array of emergency services to the public (Loveland Fire and Rescue Department, 2005). There may be different variations of a combination system that includes hiring drivers, officers, or a crew of firefighters to keep up with the demand for service. This type of system is used by fire service organizations that have experienced an increase in emergency call volume attributed to community growth or other factors.

Another way to ensure the community has fire protection and other emergency type services is to establish subscriber fees to the home and business owner. Based on the square footage of the structure, the owner is assessed a nominal fee for fire protection. The Regional Fire & Rescue Department, Inc. in Coolidge, Arizona is a nonprofit organization that has established this type of delivery system. The organization has paid personnel on duty 24 hours a day, seven days a week, and response personnel are augmented by paid-per-call personnel that work two 12-hour shifts within a month. The organization protects 160 square miles and serves a population of 8,000 people. The

concept of subscriber fees is a unique delivery system that could be taken into consideration to ensure the community has emergency response personnel available for response (Firehouse, 2006).

Third, what are other alternative delivery systems volunteer fire service organizations using in the State of New Mexico? A municipality within Doña Ana County has taken a proactive approach in ensuring that coverage is available during peak hours and on weekends. The Town of Mesilla, New Mexico is located just south of the city of Las Cruces with a population of 2,300 people and has a total of five square miles. The Town of Mesilla has an all-volunteer fire department that established a rotational shift schedule that ensures personnel are available to respond. Shift personnel stay at the fire department for a period of 24 hours and conduct regular station duties, prevention activities, inspections, and maintain a response readiness to the community. The fire department has a call volume of approximately 200 call outs per year. Volunteer personnel are compensated with uniforms and other accessories so that the volunteer does not have to buy or pay for needed items or equipment (Mesilla Fire Department, 2005).

The community of Los Chavez, New Mexico also has an all-volunteer based fire department that staff's volunteers on 12-hour shifts and allows the personnel to sleep over at the fire station. The Valencia County News Bulletin reports that the county commission approved the building of a new fire station that will establish the foundation of coverage 24 hours a day (Mooreman, 2005, p.1). It is unknown if the organization will have paid personnel or remain entirely volunteer, however, the plan is to ensure the community has responders at all times. The fire department responds to approximately 150 structure fires and 300 emergency medical calls a year. The organization covers a

population of about 15,000 people and almost half the county of Valencia (Los Chavez Fire Department, 2006). In some cases the organization has a response time of over 30 minutes to remote locations within the jurisdiction.

Socorro County (2005) in New Mexico has recently restructured their six independent volunteer fire departments into a single fire service organization. The restructure was enforced by an ordinance and outlines the roles and responsibilities of the organization. The document provides job descriptions and expectations of paid and volunteer personnel, the adoption of department rules and regulations, and personnel responsibilities. It also mandates the organization to provide emergency medical services and fire investigations under the direction of the county fire marshal. The ordinance does not identify a specific type of delivery service, however the ordinance is flexible to allow the implementation of paid personnel within a primarily all-volunteer organization:

District chiefs and other willing officers of the department to perform as official agents of the department including the supervision of paid and volunteer personnel as may be deemed necessary for the protection of the health, welfare and safety of the residents of the County and for the enforcement of codes and ordinances (10.6).

Finally, what are the indications that Doña Ana County Fire Districts are in need of a system's change? The National Fire Protection Association (2004) is a consensus bureau that develops consensus standards that impact emergency response and conduct research in order for the fire service to make appropriate adjustments to improve the services they provide. The National Fire Protection Association (NFPA) conducted a Needs Assessment of the Fire Service for New Mexico. This assessment was an in depth

study of the New Mexico volunteer fire service that examined personnel, response capabilities, apparatus and equipment, facilities, training, and safety. Based on response capabilities, forty to 100 percent of volunteer fire service organizations that protect communities of at least 10,000 people have fewer than four personnel assigned to first responding apparatus. A minimum of four personnel is needed in order to safely perform interior attack operations for a residential structure fire. The lack of personnel delay initial operations until other responders arrive from either the respective volunteer fire organization or mutual aid from neighboring fire districts (p. 5).

NFPA (2004) developed the Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Volunteer Fire Departments. The purpose of this consensus standard gives volunteer fire organizations the baseline foundation to establish initial response capabilities and measure performance. In regards to responding to incidents in the community, this standard outlines the basic response time, staffing of personnel, demographics, and performance measurements for the volunteer fire department based on population. For instance, if the community is rural with less than 500 people the staffing of personnel should be six responders with a response time of 14 minutes 80 percent of the time. If the community is urban, greater than 1,000 people, the staffing of personnel should be 15 responders with a response time of nine minutes 90 percent of the time (NFPA 1720, 4.3.2). The standard further describes the management of resources for other services the department may perform, such as emergency medical response, hazardous materials response, and technical rescue.

The FMO and volunteer fire districts are governed by County Ordinance 57-88 that was established in 1988 and sets a basic foundation of roles and responsibilities for each entity. The only requirement mandated on the volunteer chief is to reside in the district in order to hold the position of chief. The fire marshal is tasked to implement rules and regulations to standardize operations for all of the fire districts. The document does not identify levels of service, delivery systems, or specific missions other than ensuring the general welfare, health, and safety of the residents of the county. The ordinance has had no revisions or updates since its implementation and is the current structure for the county (Doña Ana County, 1988, p. 2).

The Mesilla Valley Regional Dispatch Authority (2006) is the agency responsible for dispatching emergency units for the entire county. This includes the incorporated areas of the county such as the city of Las Cruces. This organization maintains response data and other pertinent information for all emergency response disciplines. In the 2005 Yearly Report, the total number of callouts for the county volunteer fire districts was 14,983. The report lists the total number of call outs and the number of missed calls for each district. The report does not compare, analyze the call volume from the past to the present, or indicate if there is a problem with delivery of response services. The 14,893 callouts is not the total number of emergency incidents for the county but a total number of times the fire districts were called upon for service. For example, if two fire districts are called upon for a single residence structure fire, the two districts get credit for a callout even though the organizations are on the same incident (p. 11).

The literature review identified key indications for change when population, growth, or lack of personnel impacts the services an organization provides. There is a

broad spectrum of delivery systems that organizations can implement based upon their needs. As organizations progress, all key indications of change should be a factor in the delivery system the organization chooses to implement.

Procedures

The purpose of this Applied Research Project (ARP) is to describe the service capabilities of the Doña Ana County Volunteer Fire Districts and seek alternative service delivery systems to meet the increasing emergency call volume with volunteer personnel in Doña Ana County. This is a descriptive research project formatted according to the American Psychological Association 5th Edition text (NFA, 2003, p. II-21).

Research and data collection began with a preliminary search at the National Fire Academy's Learning Resource Center (LRC) in December 2005. Technical reports, articles in emergency management magazines, electronic library materials, previous Executive Fire Officer Applied Research Projects and business books were used for information regarding this subject matter. Further literature reviews were conducted at the Doña Ana Branch Community College and the Las Cruces Public Library in Las Cruces, New Mexico.

There were two factors that helped focus on and identify information for this applied research project. First, the material had to be relevant to the subject matter. Second, the information that was used was as current as possible.

The focus of the research for this study was used to answer the Researcher's questions.

1. What are the national or industry trends used to indicate a system's change is needed for fire service organizations?

2. What are the national or industry alternative delivery systems used by other fire service organizations?
3. What are other alternative delivery systems volunteer fire service organizations using in the State of New Mexico?
4. What are the indications that Doña Ana County Volunteer Fire Districts are in need of a system's change?

In order to have an understanding of the impact of system changes on volunteer fire service organization in the State of New Mexico an appointment was made with Charles Eaton, Fire Chief for the Valencia County Fire Department, for May 3, 2006 at 2:00 p.m. The purpose of this appointment was to conduct an interview with Chief Eaton on a system's change Valencia County implemented in November 2005. Approval and clarity acceptance of the interview questions (See Appendix A) were given (Senior County Director S. Padilla, personal communication, March 28, 2006).

For the purpose of conducting the interview, a quality portable voice recorder with a microphone was used to record the interview. Before the interview began, Chief Eaton was given the opportunity to consent to the recording of the interview. The recording of the interview was filed for record keeping with the Doña Ana County Fire Marshal's Office. Prior to the interview, a recording test of the room was performed on the recorder to ensure a good reception was obtained for the interview.

To evaluate the service capability and need for a system's change within Doña Ana County, a questionnaire was developed to establish a baseline definition of a possible system's change within the volunteer fire districts (See Appendix B). The questionnaire was developed with simple questions and with the ability for the agency

representative to add comments. A draft questionnaire was tested on a few respondents in order to spot ambiguous or unnecessary questions. Approval and clarity acceptance of the questions on the questionnaire were given (Senior County Director S. Padilla, personal communication, March 28, 2006).

There are 16 volunteer fire chiefs in Doña Ana County. In order to achieve a 95% confidence level in the questionnaire, 16 questionnaires were needed from voluntary fire chiefs or agency representative (NFA, 2002, SM 3-1). Volunteer fire chiefs were requested to participate via an e-mail that was sent on April 10, 2006. The questionnaire data was collected for a period of 12 days. The final day for survey collection was April 21, 2006. The data received from the volunteer fire chiefs was compiled in a database and analyzed. Microsoft Office 2000 was used for this purpose, with Microsoft Excel and Word used as the primary programs. The responses were mathematically computed on a point average with the decimal rounded off to the nearest hundredth. The quantitative data was placed in table format for exact information (See Appendix E). An overall pattern of results was graphed for visual interpretation.

In order to obtain a full understanding of the issues the volunteer fire districts are experiencing in Doña Ana County, an appointment was made with Eric Crespín, the President of the Volunteer Fire Officers Association. The appointment was scheduled for May 1, 2006 at 1:00 p.m. The purpose of this appointment was to conduct an interview with Mr. Crespín on the factors affecting service delivery and possible system changes the volunteer fire districts may implement. Approval and clarity acceptance of the interview questions (See Appendix C) were given (Senior Director S. Padilla, personal communication, March 28, 2006).

For the purpose of conducting the interview, a quality portable voice recorder with a microphone was used to record the interview. Before the interview began, Mr. Crespin was given the opportunity to consent to the recording of the interview. The recording of the interview was filed for record keeping with the Doña Ana County Fire Marshal's Office. Prior to the interview, a recording test of the room was performed on the recorder to ensure a good reception was obtained for the interview.

To understand the problem of community growth the volunteers face, a comparison of population growth and the number of responses was compared. The Doña Ana County Planning Department was contacted to obtain the latest population data by fire district (See Appendix D). This data was compared to the amount of yearly fire and emergency medical responses the volunteer fire service organizations respond to. The amount of yearly responses was compiled, analyzed, and was mathematically computed on a point average with the decimal rounded off to the nearest hundredth. The quantitative data was placed in table format for exact information (See Appendix E). An overall pattern of results was graphed for visual interpretation. Microsoft Office 2000 was used for this purpose, with Microsoft Excel and Word used as the primary programs. An overall pattern of results was graphed for visual interpretation.

Assumptions and Limitations

The author of this ARP made several assumptions. First, it was assumed that each individual fire chief that responded and participated in the questionnaire fully understood the statements and questions. Secondly, it was assumed that each individual fire chief had some degree of knowledge of the issues volunteer fire districts within Doña Ana County were experiencing. Third, it was assumed the responses given by the

questionnaire participants and the interviewees were complete and honest with the goal of assisting with this ARP.

The data obtained for this ARP was limited to Doña Ana County, other counties, municipalities, and agencies within the State of New Mexico. The problems the State of New Mexico, especially in the Southwest portion of the state, are unique and may not reflect or have an impact on what other states, counties, or cities may be encountering.

The literature review revealed several sources that may be considered out dated. The information contained within these sources was significant to the ARP and the author limited the use of the sources to only those that contributed to the project significantly.

Definition of Terms

Call – A request for assistance to which equipment and personnel are deployed (NFPA, 2005, p. 48).

Emergency Medical Services (EMS) – Providing services to patients with medical emergencies (NFPA, 2005, p. 123).

Fire Service – Career or volunteer service groups that are organized and trained for the prevention and control of loss of life and property from any fire or disaster (NFPA, 2005, p. 152).

Mutual aid – Reciprocal assistance by emergency services under a prearranged plan (NFPA, 2005, p. 268).

Volunteer Fire Department – A fire department having volunteer emergency service personnel comprising 85 percent or greater of its department membership (NFPA, 2005, p. 416).

Results

The results within this section review the answers to the research questions and to the questionnaire.

First, what are the national or industry trends used to indicate a system's change is needed for fire service organizations? The literature review revealed that overall national or industry criteria on what is used to indicate a system's change is broad, however documentation outlines basic key elements or factors that identify change for organizations. National or industry criteria suggest that it is the organization's responsibility to continually evaluate the organization's capabilities to ensure they are effectively meeting the needs of the community.

Identifying a system's change is difficult. The approach of using a computer-generated model evaluating specific variables appears to be the best option in order to eliminate bias approaches in implementing change. The accuracy and success of the model should be considered by the organization due to its high confidence level.

Secondly, what are the national or industry alternative delivery systems used by other fire service organizations? The literature review revealed that national or industry delivery systems for emergency response are community specific. Some communities have established a shift schedule system that requires volunteer personnel to be at the fire station and available for response. The time personnel work per shift varies based on the need for the organization and the community. Another delivery system was a pay-per-call system in which the organization compensates personnel for the amount of calls they respond to and deliver a level of service to the customer. Personnel are compensated with money or by supplying them with needed equipment or supplies. Another system used by fire service organizations is a combination type system. The system is based on

actually paying a certain amount of personnel for response and augmenting the paid staff with a volunteer force. An alternative delivery system that could also be used by communities is privatizing emergency services for a nominal subscriber fee that is based on square footage of a home or business. Depending upon the needs of the community, any of these delivery systems could be implemented. However these delivery systems could have a financial impact on the organization and to the community.

Third, what are other alternative delivery systems volunteer fire service organizations using in the State of New Mexico? The interview with Fire Chief Charles Eaton revealed that Valencia County is an all-volunteer organization progressing towards a combination type delivery system. Chief Eaton did state that the current system could no longer support the amount of call volume the organization receives. The first step to the system's change was the development and implementation of a new ordinance that identifies services to be delivered, organizational structure, roles, and responsibilities. The organization's ordinance was implemented in November 2005. The International Association of Fire Chief's (2005) Red Ribbon Report played a critical role in identifying key indicators for the system's change Valencia County implemented

The Valencia County Fire Department has approximately 10,000 emergency calls per year and depending upon the location of the emergency the average response time is about 12 minutes. The organization's current delivery system does have a problem with emergency calls being missed because of the lack of volunteers during the day. The organization relies on mutual aid from neighboring districts when volunteers do not respond. Chief Eaton was concerned that volunteers may be screening the emergency call to only respond to what could be considered major incidents such as a structure fire.

In the current delivery system the organization does compensate their volunteer personnel. The organization reimburses personnel for meeting certain training requirements and for having certain certifications and licenses. The volunteer receives two payments every year, one in June and one in December. This acts as an incentive to participate and volunteer, however, the organization still has problems with emergency calls being missed.

Finally, what are the indications that Doña Ana County Volunteer Fire Districts are in need of a system's change? The Service Capability and System Change Questionnaire were provided to the volunteer district fire chiefs. Sixteen questionnaires were obtained for the 95% confidence level. Question 1, Question 2, and Question 3 were personnel availability questions to obtain a correlation between the 16 volunteer districts. Question 1 revealed that the fire districts have an average of 15 active personnel for response. Figure 1 depicts the responses for Question 2 and shows the percentage of availability of personnel for the 16 volunteer districts. Figure 1 shows that 62.5% of the fire districts have less than five personnel available during the day for response. In the evening, the percentage is lower at 31%.

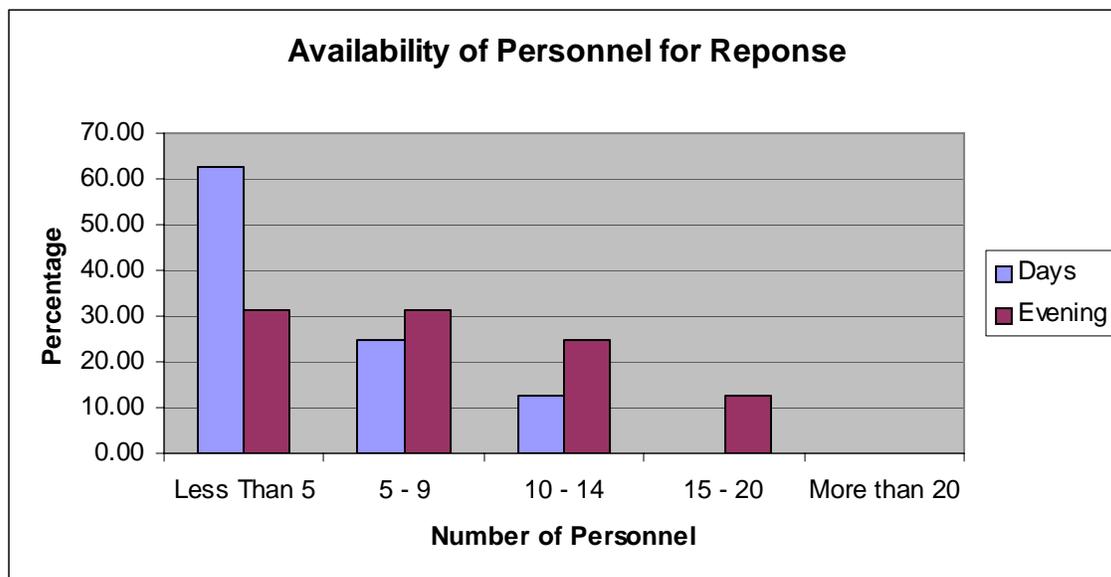


Figure 1. This figure depicts the availability of personnel.

The results for Question 3 are visually represented in Figure F1 and show that fire districts have an average of two to three personnel responding on the apparatus depending on the type call. Figure F2 shows the results for Questions 4, 5, and 6. Over 87% of the volunteer districts in the county do not have a set schedule or assigned shift. The district relies on the availability of the volunteer to respond as needed. Ninety-four percent of the respondents do not believe a set schedule or assigned shift would work because personnel have too many obligations in their daily lives and would be asking too much of the volunteer. Question 6 revealed that over 68% of the fire districts are having an issue providing trained and qualified personnel during peak time periods.

The questionnaire also revealed that over 68% of the respondents in their opinion implementing a combination type delivery system would work best for Doña Ana County. Figure 2 visually shows the results for Question 7.

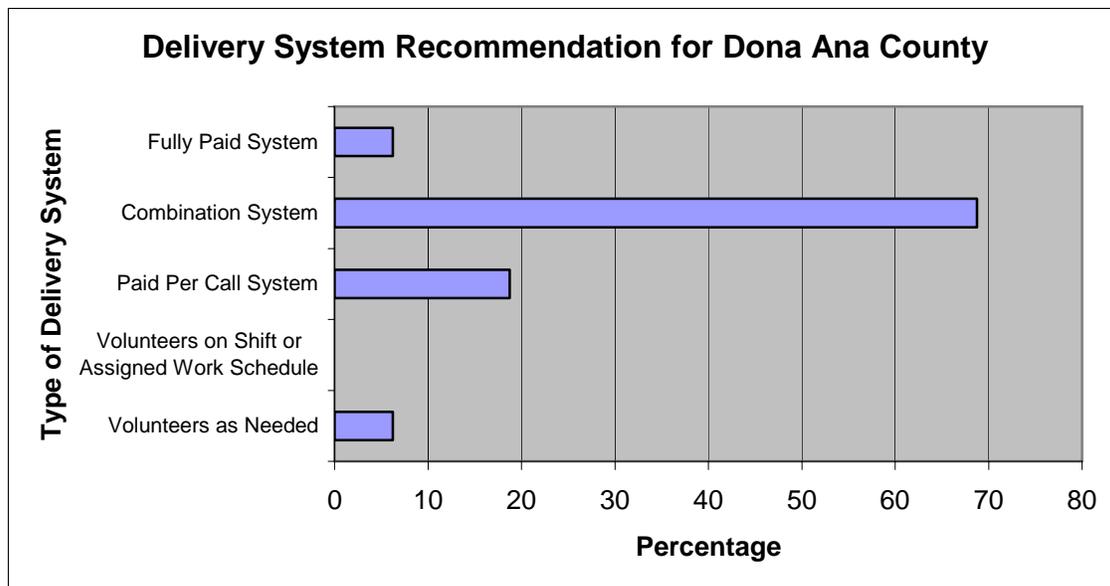


Figure 2. This figure illustrates the recommended delivery system for Doña Ana County.

Appendix D visually represents the amount of population by fire district for the years 2000 to 2005. This information was provided by the Doña Ana County Planning Department. The image reveals the largest populated fire district was Fire District 1 in the community of Doña Ana. This fire district has a population of 13,370 people. The smallest populated fire district was Rincon with a population of 1,592 people.

The amount of yearly fire and emergency medical responses was also compiled and analyzed for the years of 1996, 2000, 2004, and 2005. Figure 3 visually represents the amount of yearly fire calls for the 16 fire districts.

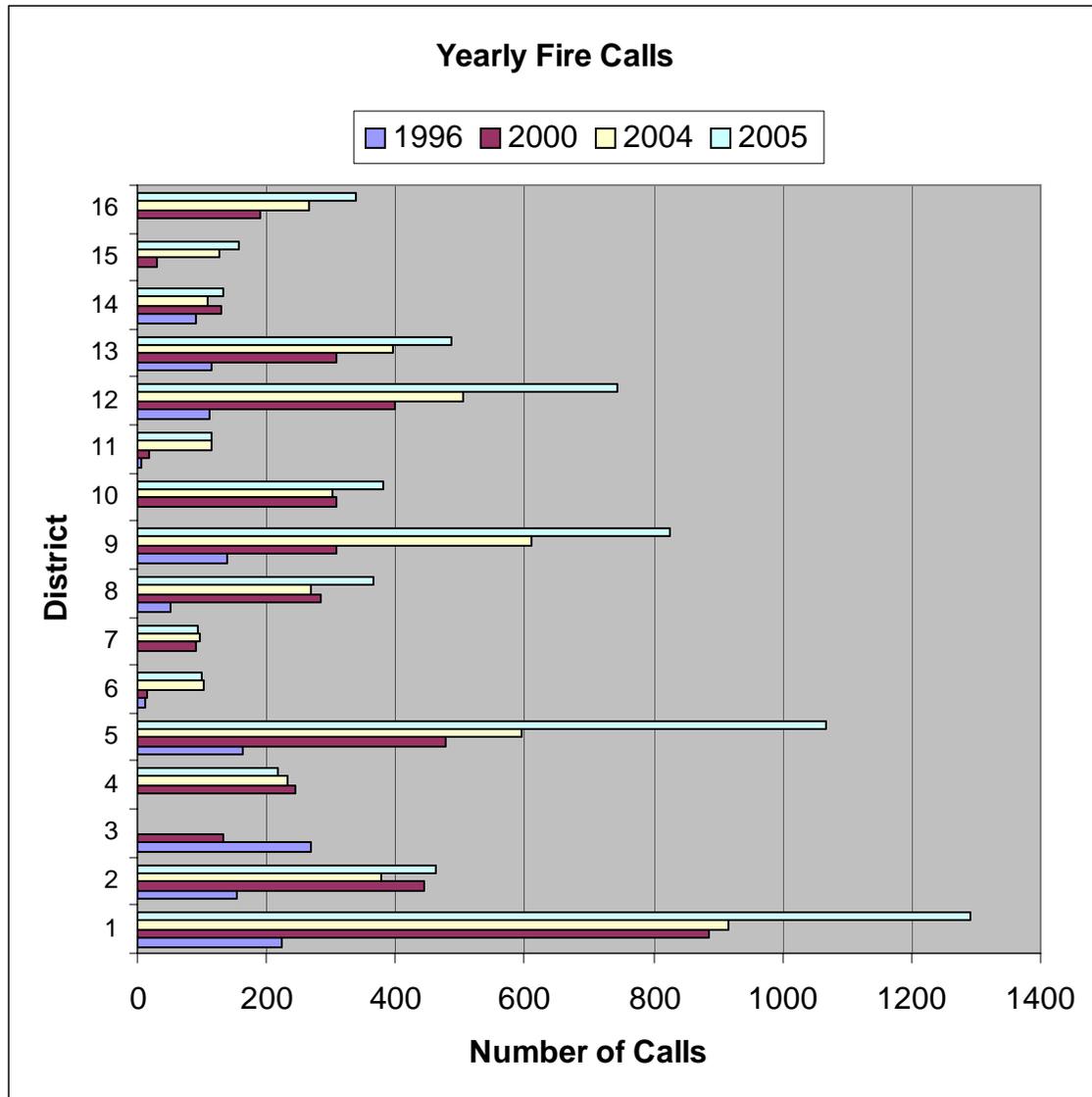


Figure 3. This figure shows the amount of yearly fire calls for 1996, 2000, 2004 and 2005.

Figure F3 shows the data for the amount of emergency medical responses for the same years.

The interview with Mr. Eric Crespin revealed that Doña Ana County is experiencing significant issues with the volunteer fire service. One of those issues is the lack of personnel that can provide service in a timely manner. Emergency responses are being missed because volunteers have to work or are tending to their families. This

problem then impacts the other neighboring volunteer districts in the county to provide service by mutual aid. Mr. Crespin felt that it is important to have an aggressive recruitment and retention program for the volunteers and provide incentives to maintain positive moral.

Mr. Crespin discussed the different types of delivery systems that could be used by Doña Ana County. In order to have a successful delivery system, the organization first needs to evaluate the level of service it wants to provide as opposed to what is currently providing. Based on the current status of the service, the amount of call volume, and the demographics including population, Mr. Crespin recommended a combination type system with performance standards to measure the delivery of service. The delivery systems of volunteers as needed, shifts or assigned schedules, paid per call, and fully paid were not viable options at this time due to the lack of personnel and lack of funding.

Discussion

The literature review revealed sources that provide insight on key indications for change. The Red Ribbon Report developed by the International Association of Fire Chiefs (2005) provide an excellent guide for organizations to focus on factors that could indicate a system's change is needed. Each organization and community faces different issues and challenges and should evaluate their capabilities accordingly. Marinucci (1990) and Baltic (1992) also identified factors in which volunteer organizations should be constantly evaluating in order to ensure an adequate response to the community. Edwards (2005) brings up an excellent point that if organizations want to be successful, they need to have the ability to measure performance. If the organization does not have

performance metrics or standards to measure against, the organization will provide stagnate services to a changing environment and community.

The use of a computer-generated model as discussed by Broviak (1996) should be considered by organizations to use as supporting justification to make delivery system changes. A complete evaluation that includes input from personnel, demographics, funding, and statistical analysis of the organization should be conducted to ensure a successful outcome for the organization and to ensure the needs of the community are being met.

The types of alternative delivery systems that have been implemented are unique to the organization and the communities they serve. Volunteer organizations struggle with the availability of personnel during the day or during peak time hours. The shift schedule works for organizations such as the Mesilla Fire Department (2005). However the shift schedule requires the volunteer to commit to staying at the fire station for a considerable amount of time. This commitment may be difficult for some personnel to adhere to. Thompson (2005) noted a pay-per-call system that seems to work for Williamstown, Massachusetts. The drawback to this type of delivery system is that the organization still relies on the availability of personnel to respond. Personnel may be compensated for response however if they are not available to respond, the needs of the community are still not being met. The interview with Chief Eaton (personnel communication) noted a similar issue in that volunteer personnel may be compensated for their certifications and training requirements, however if personnel are not available for response, the customer's needs are not being met.

The alternative delivery system of implementing user or subscriber fees is another system that may work for a given area. While having personnel available for response, there is an associated cost to this type of system. The associated cost could be in addition to taxes or other fees that residents already pay or provide. Implementing this type of system should be researched carefully to ensure that there is not an additional financial impact to the community. This could be a political situation for the fire service organization and therefore caution should be used.

The alternative delivery system of a combination type fire department may be the only solution in some growing communities. The concept of having paid responders augmented by volunteer personnel is cost effective and allows for the organization to grow with the community. The questionnaire revealed that a high percentage of the volunteer fire districts believe a combination type fire department is what Doña Ana County needs, as identified in their responses in Figure 2. The interview with Mr. Crespin (personal communication) confirmed this opinion by further elaborating that having a paid staff will reduce the impact on volunteers and the organization will be able to deliver a better quality and defined service to the community.

To further analyze the need for an alternative delivery system, the National Fire Protection Association (NFPA) (2004) developed NFPA 1720 to establish a baseline standard for initial response capabilities and performance measurements. The standard indicates that urban communities with a population greater than 1,000 people, the staffing should be 15 responders with a response time of nine minutes. In analyzing the data obtained by the Doña Ana County Planning Department (Appendix D) all of the fire districts are above the 1,000-population mark and the average number of active

responders is 15 as identified in Table E3. This comparison meets the intent of the NFPA (2004) 1720. However, the amount of call volume is also a significant factor in considering response capability. Figure 3 and Figure F3 clearly indicate a significant increase in fire and emergency medical calls from 1996 to 2005. NFPA (2004) does not give a baseline for the amount of call volume a volunteer organization should have but give an average response time for the organization. This is a significant underlining problem for the districts with heavy call volume.

The number of available personnel for response I that is depicted in Figure 1 is consistent with the needs assessment for New Mexico completed by NFPA (2004). If personnel are not available for response, service is delayed, and could result in a liability to the organization. The volunteer fire service organization must be creative in their approach to improve the availability of personnel with recruitment and retention, shift schedules, or change the delivery system.

The current structure of the organization is also a significant factor that is compounding the problems for Doña Ana County. Ordinance 57-88 (Doña Ana County, 1988) has not been updated or revisited since 1988. Other organizations such as Los Chavez (Mooreman, 2005) and Socorro County (2005) have recently updated their governing documentation to ensure the organization is able to meet the needs of the community. In the interview with Chief Eaton (personal communication), he also discussed that Valencia County recently updated their governing documentation to provide an adequate structure for the volunteer fire service. The documentation is flexible to allow for growth and the implementation of paid personnel in the future. The document also establishes roles and responsibilities to the leadership of the organization.

Recommendations

Ordinance 57-88 (Doña Ana County, 1988) is an important document that has established the building blocks for the volunteer fire service in Doña Ana County. Since 1988, the fire service has not changed, updated, or identified the services it provides to the community. The communities within the unincorporated areas of the county have grown and changed considerably. This is a key indication that a delivery system's change is needed. The ordinance needs to be updated and outlined so that the volunteer fire service can progress and expand as needed to ensure the necessary services are provided to community. The ordinance for Socorro County (2005) provides an excellent starting point for Doña Ana County to update their ordinance.

From the several types of alternative delivery systems researched in this Applied Research Project, the combination type delivery system may be the one system that that will work best for Doña Ana County. This is based on the number of emergency incidents, the availability of personnel, and the demographics of the community. Research on the cost of this type of delivery system should be studied further for feasibility. Should this type of system be used, the implementation should be progressive to ensure that a full analysis of the project can be accomplished. The analysis should reflect the improvements paid staff augmented by volunteer personnel is making to the community. The priority should be to provide quality emergency response to the community in a timely manner. NFPA (2004) 1720 provides the necessary standard for baseline response to measure the service.

Based on the key indicators for change that were identified by the International Association of Fire Chiefs (2005), Doña Ana County in cooperation with the volunteer

fire service should do a complete organization capability analysis. The analysis should review operations, administration, finance, training, safety, and ultimately the needs of the community. The current capabilities of the organization indicate that there is a significant liability to the responders and the community. The safety of the responders should be at the utmost priority for the organization.

Future researchers may want to specifically analyze the organization's capability with long range planning. It is important to understand the current status of an organization, how the organization is performing in comparison to the needs of the community, and ultimately, strategic planning will assist fire service leaders in progressing to a high performance service organization.

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Appendix A

Interview questions for Fire Chief Charles Eaton - Valencia County, New Mexico

1. Is the fire department for Valencia County classified as an all-volunteer, combination, or paid type fire service?
2. What is your organization's call volume per year and average response time?
3. What problems or issues does your organization encounter with volunteer personnel?
4. Are emergency calls missed or have a delayed response because of a lack of volunteers?
5. Did the organization research alternative delivery systems? If so, what were they?
6. If Valencia County was ever to have paid personnel, how is the county planning on funding the salaries, equipment, and supplies needed?
7. Does the organization have established performance metrics or measurable standards?
8. How often is the organization evaluated to ensure the organization is effective and efficient?
9. Most counties in New Mexico have Fire Marshal overseeing and managing the operation, why did Valencia County change your title to fire chief?

Appendix B

Service Capability and System Change Questionnaire for the Doña Ana County Fire

Districts



Dona Ana County
Fire Marshal's Office

1170 N. Solano Suite. 2400 Las Cruces, NM 88001
Ph-505-647-7921 Fax-505-647-7993

To: Doña Ana County Fire District Chiefs

From: Paul Chavez
Fire Marshal
Dona Ana County Fire and Emergency Services
1179 N. Solano, Suite 2400
Las Cruces, NM 88001

Date: April 10, 2006

Reference: Service Capability and System Change Questionnaire

The Dona Ana County Fire and Emergency Services are committed to serving our customers to the best of our ability. In our commitment, we would like to assess service capability and evaluate your input on a systems change.

Obviously, such a study requires that we evaluate the criteria used by the rest of the volunteer chiefs. We would very much appreciate your taking a few moments to complete this questionnaire. It is designed for your candid feedback and input for your organization.

Please complete the questionnaire by the close of business on April 21, 2006. You can e-mail your responses to me at the following e-mail address: paulc@co.dona-ana.nm.us

I look forward to receiving your response. If you have any questions or comments, please feel free to contact me. Thank you very much for your participation.

Sincerely,

Paul Chavez
Fire Marshal
Dona Ana County Fire and Emergency Services
1170 N. Solano, Suite 2400
Las Cruces, NM 88001
505-647-7921

Doña Ana County Fire & Emergency Services

Service Capability and System Change Questionnaire

1. How many firefighters do you currently have active for response on the roster?
2. On an average, how many people do you have available (day and evening) for response aside from regular meetings? (Circle One)

Days (7 a.m. – 7 p.m.)	Less than 5	5 - 9	10 - 14	15 - 20	More than 20
Evening (7 p.m. – 7 a.m.)	Less than 5	5 - 9	10 - 14	15 - 20	More than 20

3. How many volunteer responders does your initial response apparatus typically respond with on the following? (Circle number of responders for each response)

Structure Fires	1	2	3	4	5
EMS	1	2	3	4	5
Brush Fires	1	2	3	4	5
Other	1	2	3	4	5

4. Does the district have a set schedule or an assigned shift for personnel to work that ensures availability of response during the day or during peak time periods?

Yes No Comments:

5. Do you believe having a set schedule or shift will reduce the amount of missed calls in your district?

Yes No Comments:

6. Is having trained and qualified personnel during the day and during peak time periods and issue?

Yes No Comments:

7. In your opinion, which service delivery system would work best for Doña Ana County?

- A. Volunteers as needed
- B. Volunteers on shift or assigned work schedules
- C. Paid Per Call System
- D. Combination System
- E. Fully Paid System

Comments:

Appendix C

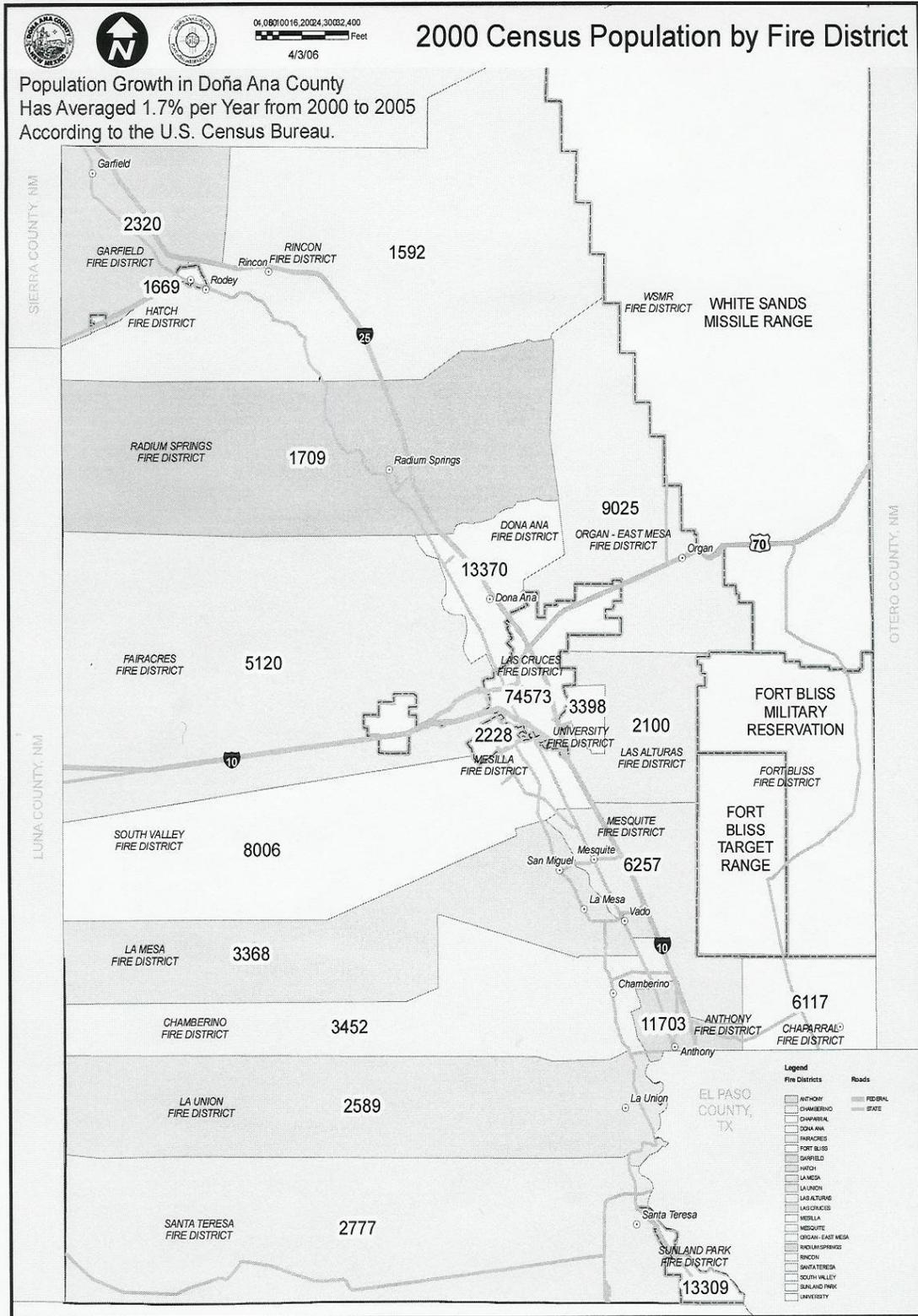
Interview questions for Eric Crespin – President Doña Ana County Fire Officers

Association

1. In your opinion, what is the greatest issues facing the volunteer fire service today?
2. What is the biggest drawback and benefits to having an all volunteer fire service system?
3. In your opinion, which do you believe is needed for Doña Ana County; Volunteers as needed, volunteer shifts or assigned work schedules, paid per call, combination system, or fully paid fire department?
4. What standards or performance metrics should Doña Ana County have in place in order to measure performance or change?
5. Describe the automatic or mutual aid policy for Doña Ana County and how does this help with response coverage?
6. Are resources being utilized appropriately in Doña Ana County to ensure maximum response capabilities or emergency readiness?
7. If funding an issue to pay personnel and if so, what alternative solutions is there for generating revenue to fund paid personnel?
8. What are your recommendations for an alternative delivery system in Doña Ana County?

Appendix D

Doña Ana County Population by Fire District



Appendix E

Tables

Number of Yearly Responses				
Fire Calls per District				
District	1996	2000	2004	2005
1	225	886	917	1292
2	153	446	378	462
3	270	133	0	0
4	0	246	233	219
5	163	478	595	1066
6	12	16	102	99
7	0	91	98	94
8	51	284	269	365
9	138	309	612	826
10	0	309	302	380
11	6	18	116	114
12	112	400	506	744
13	116	308	396	486
14	92	129	108	132
15	0	30	127	156
16	0	189	267	339

Table E1. Raw data. Doña Ana County yearly fire calls per district.

Number of Yearly Responses				
EMS Calls per District				
District	1996	2000	2004	2005
1	331	570	1075	1287
2	235	727	1002	1251
3	175	88	0	0
4	0	199	338	374
5	260	348	465	589
6	66	8	242	328
7	0	81	189	221
8	45	63	220	295
9	408	342	561	646
10	0	187	425	404
11	37	10	278	240
12	194	206	524	698
13	136	296	426	455
14	188	128	233	275
15	0	106	129	256
16	0	209	723	900

Table E2. Raw data. Doña Ana County yearly EMS calls per district.

Active Firefighters for Response																
District	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Personnel	18	5	18	14	17	15	15	12	30	10	15	19	30	10	8	10

Table E3. Raw data. Question 1 result on the Service Capability and System Change Questionnaire.

Availability of Personnel for Response					
	Less Than 5	5 - 9	10 - 14	15 - 20	More than 20
Days	62.50	25.00	12.50	0	0
Evening	31.25	31.25	25.00	12.50	0

Table E4. Raw data. Mean scores for Question 2 on the Service Capability and System Change Questionnaire.

Number of Responders On Apparatus by Type of Incident						
	1	2	3	4	5	More than 5
Structure Fires	0	25.00	56.25	18.75	0	0
EMS	18.75	56.25	12.50	6.25	6.25	0
Brush Fires	18.75	43.75	25.00	6.25	6.25	0
Other	6.25	56.25	31.25	6.25	0	0

Table E5. Raw data. Mean scores for Question 3 on the Service Capability and System Change Questionnaire.

Questionnaire Results						
Questionnaire	Question 4		Question 5		Question 6	
	Yes	No	Yes	No	Yes	No
1		1	1		1	
2		1	1		1	
3	1		1		1	
4		1	1		1	
5		1	1		1	
6		1	1			1
7		1	1		1	
8		1	1		1	
9		1	1		1	
10		1	1			1
11		1	1			1
12		1		1	1	
13	1		1			1
14		1	1			1
15		1	1		1	
16		1	1		1	
Total (Percentage)	12.50	87.50	93.75	6.25	68.75	31.25

Table E6. Raw data. Mean scores for Questions 4, 5, and 6 on the Service Capability and System Change Questionnaire.

System Recommendation for Doña Ana County	
Volunteers as Needed (Current System)	6.25
Volunteers on Shift or Assigned Work Schedule	0
Paid Per Call System	18.75
Combination System	68.75
Fully Paid System	6.25

Table E7. Raw data. Mean scores for Question 7 on the Service Capability and System Change Questionnaire.

Appendix F

Figures

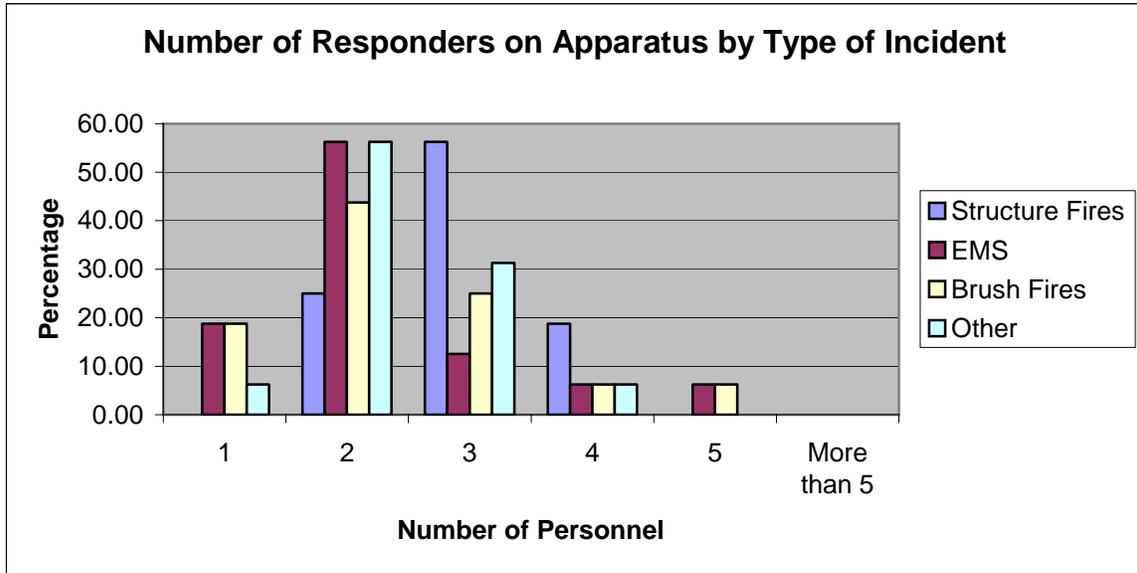


Figure F1. Figure F1 visually depicts the results of Question 3 on the Service Capability and System Change Questionnaire.

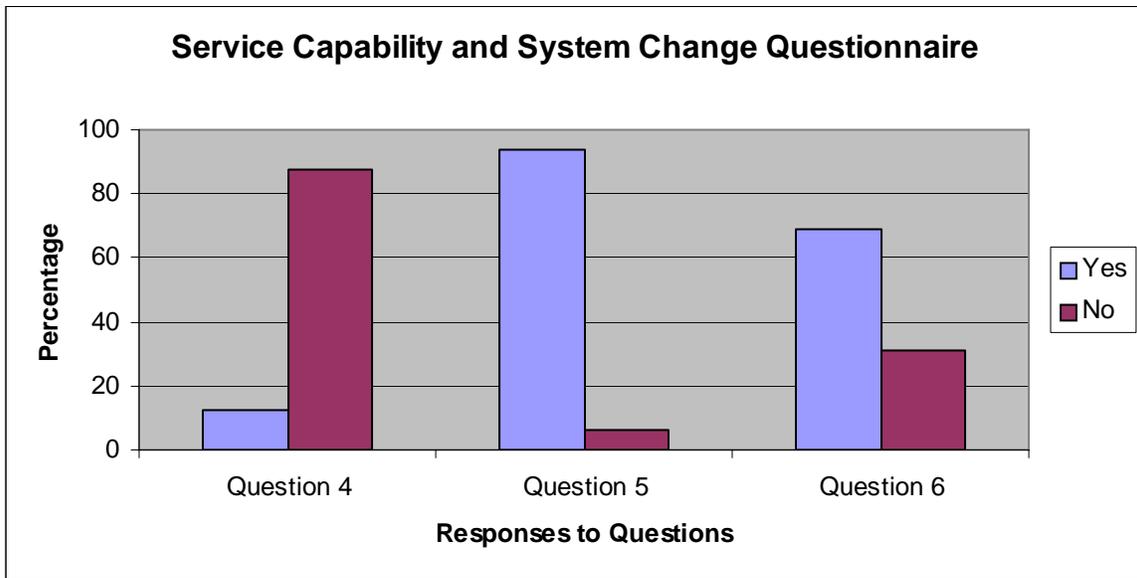


Figure F2. Illustrated results for Questions 4, 5, and 6 on the Service Capability and System Change Questionnaire.

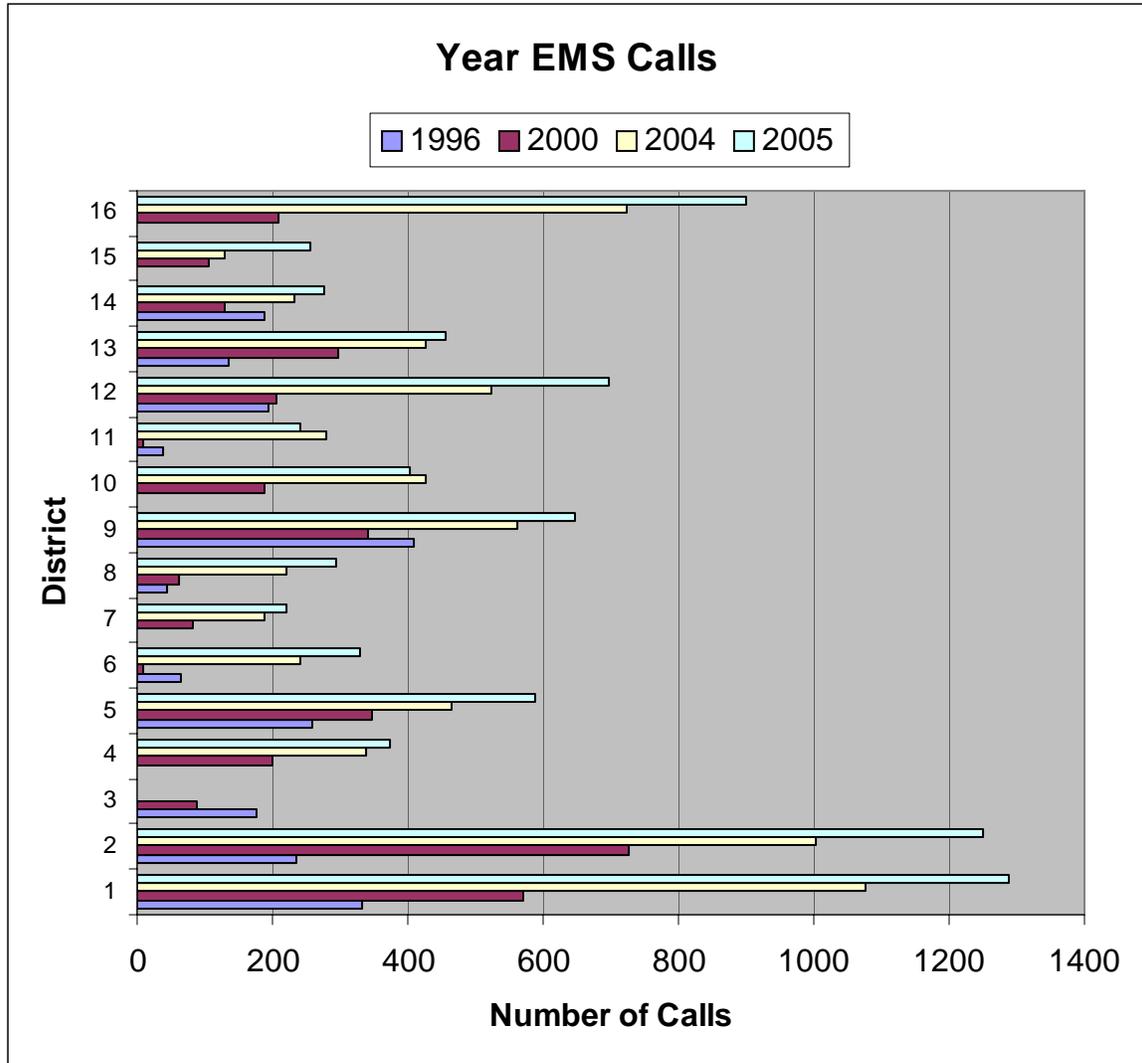


Figure F3. Illustration of the number of yearly EMS calls per district.