ALTERNATIVE FUNDING OF TECHNICAL RESCUE PROGRAMS AS APPLIED TO THE ROANOKE FIRE-EMS DEPARTMENT

FIRE SERVICE FINANCIAL MANAGEMENT

BY: Crosby R. Grindle, Jr.
Roanoke Fire-EMS Department
Roanoke, Virginia

An applied research project submitted to the National Fire Academy
as part of the Fire Service Financial Management Program

December 2001

Appendices A, D Not Included. Please visit the Learning Resource Center on the Web at http://www.lrc.fema.gov to learn how to obtain this report in its entirety through "Interlibrary Loan."

ABSTRACT

Technical Rescue Programs are fast becoming an essential component of any full service fire department. While the size and scope of the technical rescue team may be dictated by local needs and resources, one common limiting factor to all programs is adequate funding. This research project examined alternative funding sources for technical rescue programs and to develop a specific alternative funding plan for the Roanoke Fire-EMS Department's technical rescue program.

Apparatus driver and emergency scene apparatus operator is one of the most crucial and demanding positions in the fire service.

Action and historical research was performed to answer the following questions:

1. How do national standards relating to staffing, training and equipping technical rescue teams affect funding requirements for technical rescue programs?
2. What have other departments done to creatively finance special teams?
3. What local, state or federal laws and regulations affect the department's ability to collect fees for technical rescue programs?
4. What steps does the Roanoke Fire-EMS Department need to take to develop alternative funding for its technical rescue program?

A comprehensive literature review was performed, interviews were conducted with subject matter experts and a survey was used to collect the appropriate data. After the research was conducted, an alternative funding plan was identified and action steps were outlined to implement this critical and productive fire service financial strategy.

TABLE OF CONTENTS

INTRODUCTION

Responding to technical rescue type incidents requires specialized training and equipment that is very costly. Though technical rescues are “high impact”, they are “low frequency”. It is therefore sometimes difficult to justify the high cost of preparing and maintaining this type of specialized team. It is desirable to identify alternative funding for this costly but necessary response team. The purpose of this applied research project is to identify an alternative funding option that would be feasible for the Roanoke Fire-EMS Department’s technical rescue program. This will be accomplished by performing action and historical research to answer the following questions:

1. How do national standards relating to staffing, training and equipping technical rescue teams affect funding requirements for technical rescue programs?
2. What have other departments done to creatively finance special teams?
3. What local, state or federal laws and regulations affect the department’s ability to collect fees for technical rescue programs?
4. What steps does the Roanoke Fire-EMS Department need to take to develop alternative funding for its technical rescue program?

BACKGROUND AND SIGNIFICANCE

Special teams exist in the fire service to address the growing demand for unique, complex rescue situations facing firefighters in today’s modern world. Special rescue teams require costly training and equipment and dictate their own staffing and response needs. Specifically, this research project will examine the administrative needs of a

technical rescue specialty team. To properly plan and coordinate the development and maintenance of a technical rescue team requires an examination of 1) personnel / staffing, 2) the use of technology in the program, 4) policy development and implementation and 5) certainly the budget process. The study of this issue therefore relates well to many of the concepts and principles found in the Fire Service Financial Management Program. The most significant challenges to technical rescue team administration are staffing and funding, as both require considerable resources for a program that is rarely utilized but is expected to perform when the time comes.

While the scope and complexity of a technical rescue program for a given department may vary based on local needs, the demand and need for a program to exist has been developing over the last several years. These technical rescue programs have become a recognized component of the local emergency response delivery system and often have developed based on specific incidents or identified risk factors in a given community. Certainly the terrorist attacks of September 11, 2001 have heightened our awareness of this need and brought more attention and creditability of proposed technical rescue program needs. “The growth of our suburban and rural communities and infrastructure, coupled with the impact of increased sophistication and complexity in manufacturing methods and industrial process, along with the age and deterioration of our built-environment and the devastating effects and impact of natural disasters have increased the need for developing specialized response criteria and methodologies for team deployment.” (Naum, 1994, p. 30) To provide the reader with an idea of the operational response capabilities of technical rescue programs, the following list from Naum’s article is included. The boldface items

are included in the Roanoke Fire-EMS Department's Technical Rescue Program's identified capabilities objectives.

- **High & Low Angle Rope Rescue**
- **Motor Vehicle Extrication Operations**
- **Industrial Extrication and Entrapment Rescue**
- **Confined-Space Operations**
- **Trench and Excavation Rescue**
- **Below Grade Rescue**
- **Structural Collapse Rescue**
- Surface and Underwater Rescue
- **Swift Water Rescue**
- Ice Rescue
- Wilderness Search and Rescue
- **Urban Search and Rescue**
- Agricultural and Farm Rescue
- HazMat Rescue Operations
- High-Rise Rescue
- Helicopter Rescue
- Heavy Rescue applicable to Air, Rail & Maritime
- Large-Scale Disaster Response Rescue

The widely recognized standard setter for the fire service, the National Fire Protection Association (NFPA), has also set standards for operations and training for technical rescue incidents. This standard is NFPA 1670, which was developed as a

result for more frequent development and growing need of technical rescue programs and response. The standard outlines the minimum functional capabilities for safely conducting technical rescue operations in the following areas at a minimum:

1. Structural Collapse
2. Rope Rescue
3. Confined Space
4. Vehicle and Machinery
5. Water
6. Wilderness Search and Rescue
7. Trench and Excavation

(Clem, 2001)

Perhaps most significant to the development of this paper is the recent Occupational Safety and Health Administration's (OSHA) decision to require business and industry with confined spaces that are entered to maintain a response ready rescue program or ensure that one is available for response. This is documented under OSHA 1910.146 Permit Required Confined Spaces which was effective February 1, 1999. (OSHA, 1999) This documented requirement not only increases the need for a technical rescue program but also opens the door for possible alternative funding.

Technical Rescue has a long and significant history in the Roanoke area. Most of the founders of the State Heavy and Tactical Rescue Program and Team were emergency responders in the Roanoke area. The development of the statewide program spawned the development of a regional technical rescue team in the Roanoke Valley called the Specialized Emergency Response Team (SERT) in the late 1980's.

This program was documented in a regional agreement and basic funds were allocated out of operational accounts for a minimum of equipment needed for a basic response to Confined Space, Trench and High Angle rescues. The program also relied on a regional response effort. Over the years most of the founders of this program moved to other areas and support for the local program waned due to few response needs and the evolution of other more popular fire and ems service issues.

Currently, while the regional agencies cooperate on technical rescue issues like training and response, the focus is on developing department-based teams with regional response capabilities. The Roanoke Fire-EMS Department has attempted to address some of its staffing needs by creating a “technical rescue” station that the team is based at with limited success. Funding for team training and equipment still largely comes from whatever can be spared from the general operating and training budgets. A line item has been established for technical rescue equipment needs with $2,000 per year budgeted from cost savings in other areas. While staffing the technical rescue station is important due to the significant and costly training required and equipment maintenance, maintaining consistent staffing is challenging due to other staffing issues as discussed in the literature review section of this project. The Roanoke Fire-EMS Department’s Technical Rescue Program is documented in Appendix A: “Roanoke Fire-EMS Technical Rescue SOP”.

This paper will examine the budgeting component of the technical rescue program by first examining the funding needs. The two primary areas that generate funding needs are staffing and staff training and specialized equipment. Both of these

areas will be examined to establish the groundwork for the extent of the funding needs. Funding alternatives will be researched to meet these needs.

Specifically, user fee programs that exist in other departments will be examined for this issue. This area of study is critical to fire service financial management and covers such topics as “public goods” versus “private goods” versus “merit goods”. Another related subject is fee structures and the equity issues that invariably become an issue. Finally, political climate plays a big role in the decision to charge a fee over and above tax funding and impacts our research findings and recommendations.

LITERATURE REVIEW

While most paid fire departments have some special emergency response capabilities, the proficiency and type of response is usually not standardized. In fact, some special rescue teams exist in name only or fade away due to lack of support (Mellott, 1997).

Most literature and research on “technical rescue” special teams indicate the need to conduct a risk or needs analysis to first determine the type of rescues the team needs to be prepared for in their jurisdiction (Fournier, 1998). Once this is completed, funding and equipping the team comes next. The final and never-ending step is the rigorous training that technical rescue team members most undergo.

There is a significant amount of information about the importance of training for technical rescue programs. This is important because it ultimately impacts the issue of staffing a technical rescue team. Clearly, at the minimum, basic or awareness level training must be required for anyone assigned to the technical rescue team (Mellott,

1997). This is supported by Czajkowski in “NFPA 1670 Hits the Streets” when he explains that any agency has the responsibility to train responders on any equipment they may be expected to use in the course of operating as a technical rescuer. (2001) The Southampton Fire Company requires as minimum certification training for its technical rescue team members: rope rescue, confined space, trench rescue and structural collapse (Jakubowski, 2000). Some suggest that the entire department (not just the team members) be trained to the awareness level since anyone could be the first arriving unit on a technical rescue incident (Sargent, 1999) and would require this type of training to prevent harming themselves or the victim prior to the arrival of the special team.

Clearly training is critical. The question then becomes what is the right mix of training levels and staffing. The NFPA Standard for Operations and Training for Technical Rescue Incidents defines three levels of training:

Awareness – Basic training to make responder aware of risks and conduct basic rescue assessment in anticipation of a team response

Operations – Intermediate training to make provider useful as support personnel for an actual rescue and prepare the scene and or equipment for the rescue.

Technician – The highest level of training to prepare responder to fully conduct the technical rescue.

(NFPA, 1999). We have established the need for the entire department to be trained to the awareness level. There is other evidence that support staff should be trained to the Operations level and finally, the response team itself must be trained to the technician level (Sargent, 1999).

Commonly, one station will be identified as the “tech station” and will house the majority of the equipment and any response vehicle. This is where the technician level team would be assigned. Support staff trained to the operations level could be assigned to ladder companies (Sargent, 1991) as this type of training and skill is a natural match for type of work truck companies are normally assigned. These personnel must be distributed on all shifts so they are always available for response (Sargent, 1991).

One alternative to this type of staffing model is to assign trained personnel throughout the department and have them respond when alerted by special call (Rhea, 1997). Another form of this would be to assign at least one operator to the tech rescue station to provide the initial response and pull the rest of the team together from other stations. The problem with either of these formats is it requires significant coordination, could deplete multiple companies of their minimum staffing and significantly increases the response time (Rhea, 1997). Perhaps an even greater problem is that these formats make team training difficult. This is critical since technical rescue relies heavily on very special skills and teamwork, both of which come only from regular training together.

If these alternatives are not ideal, what must occur to fully staff a technical rescue team at the tech rescue station? Organizational commitment ranks high on the list of answers to this question. The successful development of a technical rescue team requires an understanding of the degree of commitment required in the way of resource allocation (Naum, 1994). Barriers such as organizational commitment and personnel commitment are often the most difficult to overcome in a given fire department

organizational culture (Sargent, 1999). Ultimately, “the successful outcome and termination of special rescue incidents relies heavily on the skills, training and preplanning in the deployment of adequately prepared and outfitted resources and personnel in order to successfully handle the challenges of special rescue operations” (Naum, 1994, p.51).

The cost of equipping a technical rescue team is also dependent on the type of emergencies the team plans to be prepared for as well as the size and scope of the anticipated response capabilities. Storing and transporting the equipment is also a consideration as special response vehicles are usually costly to purchase, maintain and operate. Based on the author’s personal experience as the Roanoke Fire-EMS Department’s Technical Rescue Program Administrative Coordinator and on current catalogue and dealer supplied pricing, estimates for equipment costs are as follows: While some basic equipment is already available, additional required equipment will total $50,000-$60,000 initially with additional annual expenditures of $2,000 to $3,000 for upgrades and maintenance. A vehicle currently exists that is utilized for transport of technical rescue equipment but it is already overloaded and too small. Many options exist to meet the equipment transportation needs such as a new larger vehicle, a larger reconditioned vehicle, make the next engine replaced a rescue engine at an additional expense, purchase a trailer, or some combination of these options. The cost varies in this area from $10,000 to $200,000. Finally as indicated in the preceding sections regarding staffing and training, the required training would be significant. The total initial training cost would be approximately $6,000 with additional expenses of approximately $2,000 per year depending on the staffing consistency at the technical rescue station.

Clearly a need exists for the technical rescue program and the costs to fully develop and maintain the program are significant. Developing the required budget from existing public funding would be extremely difficult to achieve. To do so would be especially difficult in light of the current times of financial curtailments and staffing reductions and limitations. (Naum, 1995) The consideration of how to fund such a program was one of the first issues to be raised when the Virginia Beach Fire Department undertook technical rescue program development. (Sargent, 1991) In his article Planning and Developing a Special Technical Rescue Team, Christopher Naum calls “finances” one of the four critical components of planning a technical rescue program. The importance of this aspect of a technical rescue program is underscored in Fire Chief Magazine, “if your program is to succeed, it must be properly supported financially.” (Mellott, 1997, p.80) Mellott also emphasizes the importance of justifying program needs to elected officials in an effort to obtain their support. (Mellott, 1997)

There is evidence in the literature that alternative funding for costly technical rescue programs should be considered. While some of the financial considerations of the technical rescue program may be met with traditional line item budget areas other potential resources include:

- Local Business and Corporations
- Special Fund Drives
- Professional Societies & Associations
- Corporate Funding
- Surplus Equipment Allocation

There are many examples of special teams receiving tools, equipment and financial support from the private sector. Legislative support or funding and grant applications are yet another area of potential assistance for alternative funding resources. (Naum, 1995) More current literature suggests that some private industry funding sources may be "drying up" as they move toward providing their own programs to ensure adequate compliance with laws and industry standards. (Mellott, 1997)

While corporate "hand-outs" may be going by the wayside, Mellott suggests that partnering with industry to share resources or to attempt to create a mutually beneficial relationship are useful in exploring. This is exactly the type of thinking that resulted in the "PIER" (Partners in Emergency Response) program developed by the Lynchburg Virginia Fire Department. (Puckett, 1999) This program utilizes a user fee designed to offset the cost of providing confined space rescue services to local industry that is required by the OSHA 1910.146 final rule of February 1999 to have confined space rescue available. The fee is less than the individual industry would have to pay to provide the service itself but the combination of fees provides enough funding to the Lynchburg Fire Department to cover the costs of training, staffing and equipping a team capable of meeting local industry's need.

Another form of a user fee is seen in the Nestucca Oregon Fire District. User fees are collected from all-terrain vehicle permit fees required of recreational off-roaders in parks, beaches and trails. A portion of these funds were used to purchase an off road vehicle used to provide sand dune rescue to the area. (Fournier, 1998) There is additional evidence of user fee funding in the fire service in the form of cost recovery after responding to a hazardous materials emergency incident. Virginia is one of the

states in the nation that has authorized local agencies to bill in an effort to recover costs associated with haz mat response under the state's code covering abatement and removal of nuisances. (Moses, 2001) While these fees can help, they are controversial because of their long history in the fire service and the reputation they have of deterring people from requesting assistance. (USFA, 1995) As with other forms of additional fees, it is suggested that while user fees can be a good source of revenue, they require political and community support. (DiPoli, 1997)

Sometimes user fees are called subscription fees which date back 200 years. This type of fee enables subscribers to avoid paying a substantial charge for service should they have an emergency. In order to implement such a program usually requires political support and legislation. One problem with subscription fees in general is the frequent public misunderstanding that if they are not "subscribers" they would not receive emergency services in the event of an emergency. (USFA, 1999) Similar to a subscription fee and similar to Lynchburg Fire Department's PEIR program fee are Haz Mat storage fees. (NFPA, 1984) These fees are designed to offset haz mat emergency response team costs by charging industries that store and use substantial quantities of hazardous materials and subsequently are more likely to require an emergency response. (USFA, 1999)

The Technical Rescue Program Development Manual also suggests that permit fees could be utilized to partially fund a program. These fees could be charged to construction contractors or businesses that are likely to need technical rescue services. While there is an additional advantage with this program of creating an opportunity for pre-planning, the manual points out that local and state ordinances may be required to

institute these types of fees. (USAF, 1995) Other fire service literature suggests that it is reasonable to establish a fee structure for businesses that due to their nature create increased or special demands for fire service response. (McGrath, 1990)

A related charge for service offered above and beyond the normal requirement is the fire flow charge concept evidence of which exists at least back to the early 1980's. With this program, a fire protection charge is levied to occupancies that have a disproportionately large fire flow water demand due to their size or nature of business. (NFPA, 1984) This type of program has been established in certain areas utilizing the Insurance Services Office (ISO) fire flow formula and breaking a municipality down into fire zones with corollary fire flow fees based on demand. (West Palm Beach FD, 1989)

Perhaps some of the most useful and relevant literature reviewed for this project came from the International City Manager's Association (ICMA). "The Growth of user fees as a source of municipal revenues has become a commonly acknowledged trend." (Howard, 1987) This document defined user fees as "municipal charges an individual can avoid by foregoing consumption of the goods or services being offered." (Howard, 1987) It is explained that if avoidance of the fee is difficult if not impossible then the fee cannot be called a fee but is instead a special assessment. Efficiency and equity are two important considerations when examining the possibility of a user fee. Efficiency issues include considering the percentage of costs that will be recovered by the fee and what will be the administrative costs of collecting the fee. Equity issues include equal treatment of individuals in equal and unequal circumstances. (Howard, 1987)

Additionally, ICMA points out the importance of considering the amount of subsidization the municipality wants to provide for a given service. A classification of

the type of service provided must be performed. "Public goods" benefit the community as a whole and individual beneficiaries are difficult to determine. "Private goods" are services where the individual beneficiaries are relatively easy to identify. The final set of goods are "merit goods" which have identifiable individual beneficiaries but their consumption also benefits the general public. Clearly private goods are easily justified as requiring user fee subsidization and public goods require general tax fund subsidization. However, merit goods fall into a gray area that is more difficult to determine the amount of general fund and user fee subsidization that is appropriate. (Howard, 1987) With this in mind, we can therefore understand that imposing a user fee on merit or private goods and keeping taxes constant may actually maintain equity with disadvantaged residence by freeing up general fund dollars for other public goods programs. (Howard, 1987)

This literature also provides the reader with a seven-point checklist developed by St. Paul Minnesota for the previously mentioned difficult task of evaluating the appropriate level of subsidy a merit good should receive. Additionally, it points out that legal restrictions may exist preventing a locality from collecting more revenue for a program than the program actually costs. (Howard, 1987)

PROCEDURES

Methodology

Research for this project employed historical, descriptive, evaluative and action research techniques to gather information sufficient to develop a plan for an alternative funding strategy to fund the technical rescue program for the City of Roanoke Fire-EMS

Department's technical rescue program. A general overview of the research design for this proposal is as follows. First, data collection involved a literature review of state and national standards, as well as industry publications on the subject. It also required in-person and phone interviews with department personnel, other agency personnel and other city department (such as the finance department) personnel. Data was assimilated and used to synthesize an alternative funding strategy proposal.

Evaluative research employed the construction and use of a survey instrument. The survey, which is found in appendix B, consisted of a one-page questionnaire of seventeen items and an area for respondent contact information. The survey was distributed via email, with a cover note as to its purpose, to the membership of the Virginia State Fire Chief's Association who had email addresses (120 people) as well as 32 personal fire service contacts from the author's personal resources. Respondents had the option of returning the survey by email or fax. The three sections of the survey were: "Department Characteristics", "Department Technical Rescue Program Information" and "Funding Information". The survey was designed to assess the relative similarity of the surveyed department to the Roanoke Fire-EMS Department and gather information about their technical rescue program and how it is currently funded.

The first section on department characteristics asks for population, square miles, staffing and equipment. The second section is more specific about the respondent's technical rescue program. It was designed to determine the size, scope and cost of the respondent's technical rescue program. In the last section, information about the nature of the technical rescue program funding is requested. Perhaps most importantly,

information about obstacles to collecting fees for specialized services was also requested.

Limitations

No matter how thorough the planning or the experience level of the researcher; any study has its limitations. While this study was no exception, its limitations were minimal due to the cooperative nature of the fire service. The research methodology utilized involved several limitations affecting the results. Limitations were primarily in the areas of the action research involving the survey and interviews and the historical research presented in the literature review.

Conducting survey research is difficult to do without numerous limitations but the original results and data that can be obtained is valuable. Constructing and distributing a survey that does not bias the respondent's answers is challenging. While every effort was made to create an appropriate survey, through the research process the author learned (after the survey was distributed and many were returned) that some of the questions could have been worded more effectively. Some of the survey questions were subjective and the interpretation of the question could vary resulting in inconsistent data collection. Survey population was also a limitation with this research as the surveys were distributed via email only and primarily to Virginia departments. Another limitation was that sometimes the person completing the survey was not the most knowledgeable person in the department about the subject.

Limitations also existed with the historical research. While there was adequate information found in the literature search for related subjects, the main purpose of this research was not found due to the uniqueness of the subject. While this may have

been a limitation, it also demonstrates the originality of this research project. Finally, the personal interviews while extraordinarily useful for real life application, are limiting due to their subjective nature. The other limitation with personal interviews was that several of the people that were key to essential information for the application of this research to the Roanoke Fire-EMS Department were very difficult to schedule time with. This limitation has resulted in the need to continue some of the final research after the conclusion of this research paper as outlined in the recommendations section.

RESULTS

Survey results, interviews and literature reviews were used to obtain results and answers to the questions posed in the introduction section of this research paper. Of the 152 surveys distributed, 25 were successfully returned and used for data collection. Highlights of the results of these returned surveys are found in appendix C in table format.

Answers to the research questions are as follows:

1. *How do national standards relating to staffing, training and equipping technical rescue teams affect funding requirements for technical rescue programs?*

Using information obtained from the literature search and personal interviews provided the information for the answer to this question. There is clear evidence in the literature reviewed that staffing, training and equipping a technical rescue team are all essential elements to a successful program. While many variations of the specific program configuration exist, some factors were consistent with all programs. Team staffing and training are an interwoven issue. The number and location or assignment

of the team staff is related to the amount of training that the team can afford to maintain as well as the number of total department members. In general, all responders must receive awareness level training to ensure their safety and enable them to make educated decisions on the level of technical rescue response needed. Additionally, it is preferable to centrally locate a team to facilitate more effective training, equipment upkeep and response. The size of the “core” team can vary based on the amount of support personnel trained to the awareness or technician level that are available. A core team of at least 8-12 trained to the operations level is desirable for an adequate response given other staffing obstacles.

In order to properly equip a technical rescue team, it must first be determined what types of responses the team is to be prepared for. Based on NFPA standards these responses should include: Structural Collapse, Rope Rescue, Confined Space, Vehicle and Machinery, Water, Wilderness Search and Rescue, and Trench and Excavation. It is very difficult to determine the exact cost of equipping a team for all of these responses for several reasons. First, a fire department will already have much of the infrastructure required for many of these responses. Secondly, many partnerships with other organizations, agencies and businesses will provide equipment at no or little cost. Finally, there is a wide range of decisions to be made on items that are not required but are desired that can cause total cost to fluctuate substantially.

Based on the author’s research and personal experience it is reasonable to conclude that the overall cost of equipping and maintaining a technical rescue team for a medium size department that already has some technical rescue training and equipment is $150,000 to $200,000 a year inclusive of incentive pay for team members.

2. What have other departments done to creatively finance special teams?

Both literature review and survey results were useful in answering this research question. There were numerous ideas for creative financing found in literature indicating the possibility of alternative funding being available. These ideas include: obtaining support from local business and corporations, generating special fund drives, creating and or gaining support from professional societies and associations, obtaining corporate funding and searching out and obtaining surplus equipment allocation. Related to some of these suggestions are historical references to funding sources that have been used for other special fire service needs. These include subscription fees for hazardous materials storage and potential emergency response and fire flow fees that are based on the amount of fire load occupancies in a given zone present to the local fire department. User fees were also collected by at least one department for a recreational situation that created the potential need for specialized rescue. The fees were therefore used to help fund this need.

The survey results were notable for this section of research not as much for what alternative funding ideas they provide as much as for the *lack* of alternative funding ideas are being utilized by the survey respondents. Of the 19 respondents who had defined technical rescue programs, 11 indicated their funding came from regular operating budgets, two came from grants, one came from an ad volorem tax and one from a municipal bond. While none of the survey respondents indicated that they charge a fee of any kind for technical rescue services, four did indicate cost recovery for hazardous materials response costs and 11 charged for some form of EMS services.

When examining possible obstacles to charging and collecting special fees the most common concern was citizen perception that existing taxes should cover costs of services with nine of the surveys indicating this. Four respondents seemed to be indicating that the political and or administrative position was against utilizing anything but regular tax revenues for services. At least two respondents indicated that the low occurrence of technical rescues would also make the fee not cost effective. Other concerns indicated the billing process itself, local legislation and educating and selling the public on the idea. At least one respondent indicated that there should not be a problem due to existing hazardous materials response billing ordinance. Highlights of the survey results are found in appendix C.

Perhaps most important was the information provided by the Lynchburg Fire Department in their PIER system. This system utilized a subscription format that provided local business and industry with the OSHA required confined space rescue team based on their agreement to pay an annual fee for the team's availability. The annual fee was based on the business's number of confined spaces and the number of annual entries made in those spaces. While this was a voluntary program, there was a City Council resolution that provided for a response fee to be charged if there was a technical rescue response to a business that had not subscribed to the service. In an interview with Les Puckett, Deputy Chief for the Lynchburg Fire Department, information was obtained as to the success of obtaining funding from this type of program. Chief Puckett indicated that projected revenues for this program ranged from $100,000 to $200,000 annually. After a year and a half the program is only generating $20,000 a year. He felt this was due to the voluntary nature of the program and industries general

willingness to take the risk of an inspection and a possible warning. He also felt that over time the annual collection would increase. Specific information on this program can be found in appendix D.

3. *What local, state or federal laws and regulations affect the department's ability to collect fees for technical rescue programs?*

While this research question was probably one of the most important, it was also one of the most difficult to obtain answers to. Answers to this question can be found both from looking at laws and regulations facing other departments and looking at what is known to affect the Roanoke Fire-EMS Department's ability to collect fees. There was evidence that in at least one state (California), it was only permissible to generate revenue by collecting fees for a specific service if the revenue did not exceed the cost of providing the service. In addition to this specific prohibition, there were numerous warnings that a locality contemplating the implementation of a user or subscription fee should first determine if there are any local or state laws affecting the plan.

During an in person interview with Jesse Hall, the City of Roanoke's assistant finance director, he indicated that depending on the exact nature of the fee and how it was collected, an amendment to the City's fee compendium by City Council would be necessary. During a phone interview with Bill Hackworth, the City of Roanoke's City Attorney, he indicated some concern about liability of a subscription based technical rescue program due to the contractual nature. In a follow up interview suggested by the City Attorney with Glen Asher, City of Roanoke Risk Manager, he confirmed the need to be cautious of the liability issue. He indicated that as municipal emergency responders

there is a tremendous amount of liability protection while performing in the course of the fire department's duties. If a contractual arrangement is made with local businesses to provide technical rescue services for an annual fee, that exemption from liability may be reduced or eliminated since the responders would be evaluated as contractual service providers instead of general municipal responders as would be the case if no contract existed and an emergency response was required at the same business. Specific to the City of Roanoke would be the possibility of covering a $250,000 deductible in insurance coverage.

Finally, a critical interview with a local Virginia OSHA inspector indicated strong support for a partnership program like Lynchburg's PEIR program. During this phone interview, the inspector indicated that without an in-house team or a formal written agreement with a provider like the fire department, a business would face a mandatory fine of up to $5,000 and probably no less than $2,500 depending on the mitigating circumstances. Additionally, this inspector indicated OSHA's willingness to work with the department in this type of program by educating the OSHA inspectors of the only acceptable paperwork as provided by the local fire department's subscription service.

4. *What steps does the Roanoke Fire-EMS Department need to take to develop alternative funding for its technical rescue program?*

Based on the information gathered in the research process of this project there are many steps the Roanoke Fire-EMS Department would need to take to successfully develop an alternative mechanism for its technical rescue program. While there are several forms of alternative funding suggested in literature, the research indicated that

the most realistic method to explore for a paid department of the size and make-up of the Roanoke Fire-EMS Department and the limitation of this paper is something similar to the subscription based program found in the City of Lynchburg.

Research with specific key individuals in the City of Roanoke indicated the need to continue researching specific questions about the program parameters and the need to obtain specific information from the City of Lynchburg such as the council resolution that Lynchburg passed to enact the PEIR program. Additionally, the issue of responder liability protection while functioning in the capacity of a contracted responder also requires further clarification from the City Attorney. After as many of these issues are answered, a final proposal will need to be formulated and presented up the City of Roanoke's chain of command for approval and ultimately City Council action.

DISCUSSION

The results of the research supported the information found during the literature review. Clearly, the fire service has recognized the need for preparedness in the area of technical rescue. Many departments base this preparation on nationally recognized standards such as NFPA 1670 Standard on Operations and Training for Technical Rescue Incidents (Clem, 2001) while others use past incidents and preplanning to determine response preparation need. (Fournier, 1998) The formulation of a team for technical rescue response requires specific training (NFPA, 1999) and equipment that is costly. Related to this is the challenge of maintaining these highly trained and equipped staff at a station in preparation for a response (Mellott, 1997) and maintaining awareness training for the entire department. (Sargent, 1999)

The cost of developing and maintaining a properly prepared and motivated technical rescue team is substantial. In light of government funding constraints, alternative funding for such a low frequency and costly program is desirable. (Naum, 1995) Many options exist for alternative funding in the fire service. (USFA, 1999) User fees and public – private partnerships are documented as solid forms of alternative funding for technical rescue programs. (USFA, 1995) Other than for hazardous materials response cost recovery and one indication that fees were charged for hazardous materials response preparation, there was little evidence that fees were actually used as alternative funding. The research results indicate that many localities are concerned about public perception of user fees and that the low occurrence of technical rescue responses would make them not cost effective.

The author's opinion is that these are shortsighted positions for two reasons. First, the subscription fee concept proposed by this report is for business and industry and would be designed to help lower their costs of providing their own OSHA required team and assist them in avoiding mandatory fines for not having an identified team. Secondly, the subscription proposal is not based on responses or actual incidents but based on the number of confined spaces and annual entries the business or industry makes. This type of program creates a mutually beneficial partnership in that the business receives solid assurance that its legal and actual confined space technical rescue needs are met much more cheaply than they could be fielding an in-house team and the fire department is able to operate a comprehensive, well trained and equipped team with little or no internal funding required. The "private" good provided to the business is also a "merit" good to the community as a whole that may also utilize some

of the technical rescue team's services especially during a natural or man-made disaster.

The research indicates that there are many variables that make it difficult to develop specific figures for the cost of a technical rescue team. It is also difficult to determine exactly how much money would be raised from this type of voluntary subscription service. The key to the success of the program lies with top down support. (Mellot, 1997) Additionally, marketing and careful management of resources and staff will be required for the program to be cost effective. While the Lynchburg program has had a slow start, the research indicated that enforcement of mandatory fines may vary from Lynchburg to Roanoke and the stiffer interpretations found in Roanoke may result in an improved participation in the Roanoke area. Additionally, the larger number of business and industry maintaining confined spaces in Roanoke also increase the revenue projections.

There is solid evidence through historical and action research that pursuing some kind of subscription fee program to fund Roanoke's technical rescue program is worthwhile. There are several important issues that would need to be addressed before garnering the essential support from key City of Roanoke administration leaders. The next section outlines what steps need to be taken to make a successful proposal for this alternative funding strategy.

RECOMMENDATIONS

After thorough research and analysis, several recommendations can be made from the conclusions. The Roanoke Fire-EMS Department's technical rescue program

is still in a developmental stage. In order to fully develop and maintain a technical rescue team, a substantial funding source must be identified. The research indicates that the funding alternative that is most likely to be successful for the Roanoke Fire-EMS Department is a subscription program for confined space rescue for local business and industry.

The success of this program is dependent on several factors. The issue of the contractual arrangement and its impact on the liability of the responders, the department and the City of Roanoke must be worked through. This will involve working with the City of Lynchburg administration and the City of Roanoke administration. To fully resolve this issue may also require additionally national, state and local research that could not be completed in the time frame of this paper due to the number of individuals involved. Following this action, a more formal proposal should be drafted and presented to both business and industry to determine their interest and city administration for approval and ultimately to City Council for action. Assuming the aforementioned steps are successful, effective marketing will be required as the last step.

To successfully implement a subscription program for confined space technical rescue in the City of Roanoke, the following steps should be taken:

1. Obtain council resolution document from Lynchburg for the Roanoke City Attorney
2. Determine feasibility of creating subscription service without incurring an unreasonable amount of liability to the responders or the City of Roanoke
3. Draft a program proposal to include team costs, program parameters, annual budget and financial consequences of low participation.

4. Market program to local business and industry to determine interest.
5. Promote plan to City of Roanoke Administration
6. Take appropriate steps with regards to any necessary City Council required action
7. Identify a program manager.
8. Implement program and market it heavily to local business and industry
9. Develop quality and accountability checks to ensure program training, equipment and budgets are maintained.

REFERENCES

Clem, L. (2001, February/March). Rope Rescue NFPA 1670: Operations and Training for Technical rescue Incidents. Advanced Rescue Technology, 4 (3), 59-61.

Czajkowski, J. (2001, March). NFPA 1670 hits the streets. Fire-Rescue Magazine, 46-51.

DiPoli, (1997, November). 10 Capitol Funding Sources That Still Make Sense. Responder, 10-29.

National Fire Protection Fire Protection Association. (1984). Fire Almanac, 229-231.

Fournier, P. (1998, November). A tale of two villages. Fire Chief, 48-53.

Howard, K. (1987, September). Determining Appropriate User Fees. ICMA MIS Report, 19, (9), 1-10.

Jakubowski, G. (2000, April). Tech rescue made easy. Fire-Rescue Magazine, 18, 58-63.

Moses, T. (2001, August). Maximizing Hazmat Cost Recovery. Fire Economics, 2 (8), 60-64.

Mellott, K. (1997, April). Keeping up with the Jones. Fire Chief, 41, 74-82.

McGrath, (1990, October). Fire Department Revenue Possibilities. The Gong, 40.

National Fire Protection Association. (1999). NFPA 1670 Standards for Operations and Training for Technical Rescue Incidents. 1-61.

Naum, C.J. (1994, December). Planning and developing a special technical rescue team (part 1). The Voice, 29-43.

Naum, (1995, January). Planning and developing a special technical rescue team (part 2). The Voice, 37-39.

Occupational Safety and Health Administration (1999) Federal Code of Regulations 1910.146.

Puckett, L., (1999, October). Partners in Emergency Response (PIER) Program. City of Lynchburg Fire Department. 1-5.

Rhea, R. (1997, March). Organizing and training special rescue teams. Fire Engineering, 150, 75-81.

Sargent, C.N. (1991, June). Forming a technical rescue team. Fire Chief, 34-36.

Sargent, C.N. (1999, October). NFPA 1670: new standards for technical rescue. Fire Engineering, 152, 83-96.

United States Fire Administration. (1995, August). Technical Rescue Program Development Manual. Emmitsburg, Maryland.

United States Fire Administration. (1999, December). Funding Alternatives for Fire and Emergency Services. Emmitsburg, Maryland.

West Palm Beach Fire Department (1989, January). Fire/EMS User Fee Survey Results. 1-16.

APPENDIX A

Roanoke Fire-EMS Technical Rescue SOP

APPENDIX B

Funding Technical Rescue Programs Survey

Roanoke Fire-EMS Survey

Funding Technical Rescue Programs

"Real Quick Survey That Won't Take Long For You To Complete and Will Be Greatly Appreciated"

Department Characteristics

1. Total population served: _____ Square miles of primary response area: _____
2. Indicate total number of uniformed personnel in each staffing category for your department:
   _____ Paid _____ Volunteer _____ Part-Time _____Other
3. Total number of: Stations _____ Engines _____ Ladders _____ Medic units _____ Other _____

Department Technical Rescue Program Information

1. Does your department have a defined technical rescue program? _____ defined team?_____
2. If "Yes", how many and how are they assigned (centrally or dispersed throughout the department)? ____
   _____
3. If "Yes", what types of incidents are they prepared to respond to? _____
   _____
4. Does your department have dedicated technical rescue response vehicle(s)/equipment?_____
5. If "Yes", Please describe very briefly including approximate cost if known: _____
   _____
   _____
   _____
6. If you have a defined team, are they compensated in any way for their participation in the program? _____
   If so, please explain: _____
   _____
7. If you have a defined team, what type of training do they receive or are required to obtain/maintain?
   _____
   _____
8. Is this training provided at no cost? _____ Are the team members compensated for training time?
   _____
9. **Estimated cost of initial team member training: _____**
10. If known, what is the total annual cost of your technical rescue program? _____

Funding Information

1. Does your department have a separate technical rescue budget and if so how much is it? _____
   _____
2. Where did the budget come from? Operating expenses? Capital improvement? Increase? _____
   _____
3. Does your department collect fees for any of its services (ambulance, confined space rescue, etc.)? _____ If "Yes", please explain: _____
   _____
   _____
4. What do you think would be the biggest obstacle to collecting fees for specialized services in your municipality?
   _____
   _____
   _____

Name and contact information of person completing form: _____

_____

Please Return to Crosby Grindle, Roanoke Fire-EMS (540) 387-6916

FAX - 387-6321 email: crgindle@ci.roanoke.va.us *by December 4,2001.*

THANK YOU FOR YOUR HELP!

APPENDIX C

Highlights of Quantitative Survey Results

Survey	Pop. Served	Sq. Miles	Total Staff	Stations	Equipment	Tech Team	Location & #
1	61,000	35	47P	4	3E, 1O	No	
2	262,300	244	370P, 10V	17	17E, 4L, 6M,	Yes	1 lad & eng
3	84,000	245	102P, 250V, 4PT, 4O	11	11L, 4L, 12M	Yes	dispersed
4	400,000	220	300P, 60V, 100O	24	26E, 2L, 1O	Yes	30 (21@1sta)
5	263,000	244	375P, 12V	17	17E, 4L, 8M	Yes	40 (25@1sta)
6	92,000	400	61P, 200V	8	15E, 2L, 20M	No	
7	50,000	722	9P, 300V, 4PT	10	20E, 1L, 20M, 8O	Yes	dispersed
8	600,000	800	746P, 111V, 148O	34	37E, 6L, 22M, 34O	Yes	1 sqd station
9	20,000		15P, 10V, 20O	4	4E, 10O	No	
10	600,000	640	1680P	52	52E, 27L, 28M, 5O	Yes	All @ 2 sta.
11	21,000	20	60P, 20V, 3PT, 12O	2	2E, 1L, 2M, 1O	No	
12	1,200	1	13P, 32PT		6O	Yes	All
13	200,000	26	280P	10	10E, 2L, 7M, 6O	Yes	27@1sta.
14	35,000	52	14P, 30V, 2O	2	4E, 3M, 7O	Yes	12/varies
15	128,000	15	150P, 4V, 50O	8	8E, 3L, 5M, 3O	Yes	1 eng & lad
16	256,000	444	350P, 200V	17	26E, 5L, 6M, 3O	Yes	49 total div by shift
17	180,000	78	340P	9	11E, 7L, 9M	Yes	5/shift central loc.
18	270,000	484	375P, 100V, 20O	17	27E, 5L, 10M, 8O	Yes	47, majority @ 2 sta.
19	25,000	14	62P	3	4E, 2L, 3M	Yes	dispersed
20	142,000	52	207P, 250V	10	18E, 2L, 16M	No	
21	57,000	387	6P, 350V	10	46E, 2L	No	
22	180,000	66	409P	16	12E, 3L, 12M, 1O	Yes	6min/shift @1sta.
23	58,000	108		6	7E, 1L, 5M, 3O	Yes	12@1sta.
24	48,475	175	85P, 50V	5	8E, 2L, 7M, 7O	Yes	20/dispersed
25	964,712	399	1,167P, 341V	35	35E, 12L, 40M, 8O	Yes	240@3sta.

Survey	Vehicle/equip.	Member compensation	Cost of program	Budget	Funding source	Fees	Obstacles
1						EMS response	Citizen perception that taxes pay for services
2	Yes/$500K	No (points for career development)	$15,000	$15,000	Operating budget	no	No political support
3	Yes/truck	No	N/A	No	No	Amb. Trans.	Rare occurrences
4	Yes/$360K 2truck/trailer	Yes – 3% of base FF	$100-150K	$100K	General fund	no	Legal and citizen perception
5	Yes/$55K+equip. 1 truck	no	$18,000	$18,000	Operating expense	no	BOS position that tax pays for services
6			No				
7	Yes/$50-75K	?	Not known	$2,000	Operating expense	No – only for haz mat response	No need to tax funding
8	Yes/$750K	Yes - $1/hr on duty or on incident	$215,000	$1.555mill including Haz Mat	Ad Volorem tax	Yes – EMS trans & Haz Mat	Ok b/c of haz mat ordinance
9							

Survey	Vehicle/equip.	Member compensation	Cost of program	Budget	Funding source	Fees	Obstacles
10	Yes/$250K+equip 2 trucks	Yes - $68/month		no	Task Force 1 grant $	Yes – Amb. Trans & Haz Mat recovery	Inability to pay, determining responsible party, poor follow-up
11	no			no		no	Political and volunteer
12	Yes/$12K trailer	no	$1,000	no		no	No method / military base
13	Yes – 1 truck	Yes – 2 level premium based on training	$58,500	$8,500 for equipment	Operating budget	Yes – amb. transport	No local legislation & low frequency
14	Yes/$57K & 1 truck	no	$1,000	no	General fund	Yes – ambulance service	
15	Yes/$256K – 1 truck	Yes – 3% of base FF	unknown	no	General fund	Yes - ambulance	City Council doesn't like extra fees – uses tax $
16	Yes/$1mill 2 trucks	Yes – 5%	unknown	$100-150K	Wherever can be taken from	Yes - ambulance	Educating and selling idea to public & billing process

Survey	Vehicle/equip.	Member compensation	Cost of program	Budget	Funding source	Fees	Obstacles
17	Yes/$260K 2 trucks	Yes - $1,200/yr	N/A	$6,000	Initial bond $120K. maintenance out of operating budget	Yes – medic fees	Currently do bill for disposable supplies on tech rescues
18	Yes $800K 2 trucks	Yes – 5%		no	Operating budget	Yes ambulance service	Perceived as tax
19	Yes/$70K truck/trailer	Yes – comp time	$5,000	no	Other funds	no	Tax based no fees charged
20	no	no		no		Yes – haz mat	Citizen view user fee as tax
21	no	no		no		no	Public perception
22	Yes/$250K in equipment and 2 trucks	Yes – 2 ½ %	$30-50K	no	General operating expense	Yes – amb. Transport, fire inspections, special details	Identifying responsible parties
23	Yes$448K 2 trucks/trailers	no	$10,000	$5,000	Operating expense	No (take reimburse from insurance when possible)	Citizen bias
24	Yes truck/trailer	no	$75K	$75-100K	General funds	no	Citizen feel tax should cover

Survey	Vehicle/equip.	Member compensation	Cost of program	Budget	Funding source	Fees	Obstacles
25	Yes/$300K 2 trucks and trailers + $1.5 mill fema cache		varies	varies	grants	no	County position to provide services from tax base

APPENDIX D

Lynchburg VA Fire Department's PIER Program Information